Capital, Nature, Anthropocene

Marxist Perspectives on Ecological Crisis

a cura di | edited by

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Introduction
Marx as a Classic: Nature and the Present Time

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A tendency emerged in universities and, more generally, in the institutions of cultural production across the so-called West between the end of the twentieth century and the beginning of the twenty-first: the tendency, to borrow Marx's own words about Hegel, to regard Marx as a "dead dog"[1]. Progressive academic circles turned toward other political paradigms, taking figures such as John Rawls, Martha Nussbaum, Michel Foucault, and Jürgen Habermas as their principal points of reference. Marx was largely regarded as a relic of intellectual history—if not outright harmful, then at least politically irrelevant. Subsequent intellectual developments, however, have exposed the shortcomings of this hasty judgment. All of this, as is invariably the case with ideas, was closely bound up with the historical processes of social production and reproduction: the collapse of the socialist countries, the rise of the neoliberal paradigm, and a series of historical developments that need hardly be enumerated here. In the only university course devoted to Marx that I had the opportunity to attend during my student years, one of the central questions was precisely the one from which this brief contribution takes its cue: "Marx as a classic." Is Marx a classic? What defines a classic? To what extent does Marx fit our understanding of what a classic is? The German philosopher Rüdiger Bubner, who passed away in the early years of this century, reflected on what it means for a philosopher to become a classic: "One presumably becomes a classic when the struggles have ceased. This naturally occurs through temporal distance, as both opponents and supporters weaken and gradually disappear." If being a classic means precisely this—being an author who no longer has either committed followers or adversaries—then the answer to our

[1] MEW, 23, p. 27.

question is quite clearly negative: Marx is not a classic.

However, the matter can be approached differently: a classic is an author who, despite the historical distance separating them from the present, continues to speak to contemporary times. To "speak to contemporary times" means to provide material that independently and objectively enters the field of tension constituted by the problems with which the present must necessarily contend. Regardless of whether an author has opponents or supporters, regardless of whether their work provokes ideological battles, a classic reverses the usual relationship between past and present: the question is not whether the classic is adequate to the present, but whether the present is adequate to the classic. In this case, what we must ask is whether the present—understood as the public debate surrounding the issues of our time—is capable of measuring up to the material that continues to emerge from Marx's work. The contributions collected in this volume seek to address questions that help explore this issue. Among the elements of Marx's thought that enter the field of tension constituted by problems closely bound up with the present, the articulation of the concept of nature undoubtedly occupies a prominent place. Over the past two decades, the image of nature in public debate has undergone a profound transformation: no longer, or no longer merely, a fragile system to be protected and preserved, but rather a chthonic force beyond human control. The image of endangered animal species has given way to that of humanity standing on the brink of the abyss, as reflected, among other things, in the names of radical environmental movements such as Extinction Rebellion and Last Generation. The concept of the "Anthropocene," which identifies humanity as a geological force, is closely connected to these issues, insofar as it articulates the relationship between nature and humanity as one that is not fixed once and for all.

Marx offers a profound reflection on the concept of nature. My intention here is neither to provide an exhaustive account of the occurrences of the term in his writings nor to propose a taxonomy or genealogy of the concept of nature in his thought. Rather, I will highlight a number of theoretical issues that challenge both the typically modern conception of nature as structurally indifferent to humanity—and therefore as something that can be objectified and freely manipulated—and those approaches that seek to posit an undifferentiated, primordial unity of nature and history.

In the context of the capitalist mode of production, to speak of "nature" is to directly invoke the social process of its appropriation and valorization. What emerges from this perspective is a non-naïve image: a nature that is socialized and reconstructed within modes of production. At the same time, the figures operating within these modes of production are historical figures, yet of a very particular history: From «my standpoint», Marx writes in *The Capital*, «the development of the economic formation of society is viewed as a process of natural history», and it «can less than any other make the individual responsible for relations whose creature he remains, socially speaking, however much he may subjectively raise himself above them»[2]. In this sense, nature remains a sign of an element that is never entirely absorbed or subsumed within the production process, but rather the foundation from which that process originates. Moreover, nature assumes a critical significance when it comes to dissolving the tendency to naturalize existing relations, eternalizing them as transhistorical principles. Marx's complex and layered conception of nature is further enriched by his interest in the natural sciences of his time, an interest that was not merely intellectual curiosity but an integral part of his understanding of reality.

Building on this conception of nature, a significant strand of intellectual debate over the past two decades has sought to engage with Marx's thought. The question of ecology in Marx is by no means new and has emerged repeatedly throughout the history of its interpretation. As Rosa Luxemburg already pointed out, Marxian theory transcends the problems of its own time and proves capable of addressing new contradictions as they arise. Whereas an era confronted with the threat of nuclear annihilation tended to portray Marx as a Promethean figure seeking to dominate nature, the age of climate change has brought to the fore elements of Marx's thought that had previously appeared novel, if not outright heterodox. These elements concern a relationship between nature and humanity that has profoundly reshaped the terms of the debate. Here, I will merely mention the question of the metabolic rift and the concept of cannibal capitalism, since we will shortly hear from two keynote speakers who have developed the theoretical frameworks within which these issues are addressed.

[2] MEW 23, p. 16.

The conference from which the papers collected in this volume originate was conceived precisely as an opportunity to take stock of this transformation in the debate. The themes of eco-Marxism did not emerge out of nowhere; they arose from specific practical needs, which are also theoretical needs, and which can be traced back to the failure we witness daily in the capitalist and liberal management of the climate crisis. This failure calls for an effort that cuts across disciplinary boundaries and requires, among other things, a renewed approach to thinking about nature. We believe that Marx's thought still contains underexplored resources that allow us to conceive of nature in ways that are neither paternalistic nor moralistic: not as a pure origin situated outside history to which we must return, but rather in its problematic interrelation with the capitalist process of subsumption. In this volume, we have sought to bring together the widest possible range of perspectives among scholars approaching ecological questions from a Marxist standpoint. Periods of intellectual expansion give rise to different currents of thought, which, in times of crisis, risk hardening into schisms. The aim of this conference was to provide a space for collective reflection on the solutions that can and must be developed together.

In recent years, the ecological question has been, if not entirely silenced, certainly weakened in its capacity to engage public opinion within political discourse. The current climate of war has acted as a catalyst, redirecting virtually every debate toward rearmament and the energy crisis. As a result, ecological concerns have resurfaced only intermittently, in response to emergencies such as the collapse of the Langtang Lirung glacier on the border between Nepal and Tibet and, more generally, the heatwaves recorded during the summer of 2026. This volume seeks to bring together the intellectual energies of a debate whose relevance becomes all the more pressing precisely when it is overshadowed, in the public consciousness, by the industrial crisis and by rearmament as a source of capital valorization.

The papers collected in this volume were presented at the conference *Marx in the Anthropocene: Capital, Nature, Ecology, Environment*, held at Università Iuav di Venezia from March 11 to 14, 2025.

The conference was originally organized into seven sections: Environmental Sociology and Social Movements; Eco-Marxism and Ecological Economics; Society and Natural Science; Philosophy and

Natural History; Socio-Ecological Transformation; Urbanism; and Art and Aesthetics. For the publication, we decided to merge some of these sections, reducing their number to four: Philosophy; Eco-Socialism and Economics; Science and Society; and Planning and Visions. In doing so, we sought to preserve the spirit of the conference, which emphasized both the connections and the tensions between disciplines, while producing a volume that would be manageable and easy to navigate.

The editorial work was carried out by a number of members of the conference's scientific committee, which consisted of Jacopo Nicola Bergamo, Mattia Bertin, Mario Farina, Adriana Manzoni, Paolo Murrone, Pietro Daniele Omodeo.

First Part

Marx and Philosophy

First Section

Marx

For a Marxian critique of the Ideology of Nature

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Abstract

This paper offers a Marxian critique of the ideology of nature, tracing its philosophical genealogy from Hegel and Feuerbach to contemporary ecological discourse. In Hegel, nature appears as deficient externality, subordinated to the self-realization of Spirit; in Feuerbach, it is inverted into a timeless essence, an object of reconciliation detached from history. Marx exposes both as ideological: they project onto nature the hierarchies and separations produced by social relations. Reinterpreting Marx's concept of ideology as an "objective form of reality," the paper argues that modern discourses of conservationism and resourceism reproduce these mystifications in new ways – either idealizing nature as pristine wilderness or reducing it to calculable "natural capital." Against both, Marx's critique enables a dialectical naturalism that conceives human freedom not as domination over nature or retreat into it, but as the conscious transformation of the social relations through which nature itself is mediated.

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Keywords: Marx, Ideology, Nature, Ecology, Dialectical Naturalism

1. *Introduction*

The question of how modern philosophy conceives of nature is not merely theoretical but profoundly practical-political. From Hegel's definition of nature as the externalization/alienation (*Entäußerung*)

of the Idea to Feuerbach's celebration of nature as "sensuous ground", the concept of nature has carried a heavy ideological weight, shaping the way societies imagine and articulate their constitutive *nexus* with the natural dimension. These conceptions did not remain abstract philosophical positions, they reflected and legitimized concrete historical tendencies of domination over nature, from the elevation of Spirit above mere externality to the retreat into a timeless vision of nature detached from the social realm and its contradictions.

This contribution does not aim to reconstruct Marx's concept of nature systematically, but to mobilize Marxian categories as tools for a critique of the ideology of nature. After briefly examining the conceptions of nature in Hegel and Feuerbach, and Marx's critique of both, I will turn to present-day ecological discourses. Conservationism, with its myth of "wilderness", and resourceism, with its reduction of nature to "natural capital", reproduce in different forms the ideological presuppositions already criticized by Marx. Both express the social mediations that organize the relation between humanity and nature under capitalism, depoliticizing ecological contradictions into merely technical or ethical issues.

By reinterpreting Marx's intervention as a critique of the ideology of nature, this paper argues for an alternative perspective: a *dialectical naturalism* that refuses both romantic idealization and technocratic reduction. In order to clarify the framework of this paper, by "ideology of nature" I refer to the specifically Marxian conception of ideology: not as a mere illusion or subjective distortion, but as an *objective form* rooted in material and social relations through which social reality itself appears and is reproduced. It is in this sense that we must also understand the "ideology of nature" not as a simple misperception of natural reality, but as a way in which specific historical and social conditions are projected onto nature, making it appear either as deficient or as reconciled, objectified or alienated.

Nature, in this sense, is not given as an immediate *datum*, but always mediated through historically specific social practices of labour, production, and representation. The critique of the ideology of nature therefore entails showing the ways in which philosophical or ecological discourses naturalize social relations – whether by subordinating nature to Spirit (*Hegel*), absolutizing it as eternal essence (*Feuerbach*), or externalizing it as pristine "wilderness" or quantifiable "natural capital" (*Environmental ethics*).

2. *Hegel, Feuerbach and the Naturalistic Legacy*

Any critique of the ideology of nature must begin with the philosophical traditions that shaped modern conceptions of the relation between humanity and nature up to the present. In Hegel and Feuerbach we encounter two paradigmatic but opposed frameworks. Both attempt to determine the meaning of nature in relation to human existence, yet each reproduces in a different way the ideological functions historically assigned to this category. This tendency is already visible in the young Hegel. In his *Diary of a Journey through the Bernese Alps* (1796), he describes the sight of mountains and rocks as offering nothing but the monotonous repetition of the "*so ist*" – a bare "that's how it is" – which quickly becomes – in Hegel's word – "boring". Where his romantic contemporaries perceived sublimity and origin, Hegel saw only lifeless repetition. This early sense of "boredom" toward natural contingency foreshadows his later more systematic philosophical conception of nature as externality (*Äußerlichkeit*), a deficient realm destined to be *aufgehoben* in the self-actualisation of the Idea.

Let us begin with one of Hegel's most important definitions of nature, contained in the *Enzyklopädie der philosophischen Wissenschaften* (first edition 1817, revised 1830), where he describes nature as "the alienation of the Idea" (*Entäußerung der Idee*)[1]. "Nature," he writes, "is the Idea in the form of otherness" (*die Idee in der Form des Andersseins*)[2], a domain of radical contingency and variety that appears to stand in contrast to the rational self-development of Spirit. While this formulation recognizes the necessity of nature within the system of reason as a whole, it ultimately subordinates it: nature is a mere "moment" to be *aufgehoben* (sublated), overcome, and integrated into the higher self-consciousness of Spirit[3]. The result is a hierarchical dualism: history becomes the sphere of freedom and progress, while nature remains bound to externality, repetition, and chance

[1] Hegel 1830, § 247. See also Horstmann 1984.

[2] Hegel 1830, § 248.

[3] See Pinkard 2012, who interprets Hegel as a thinker of "naturalism", in the sense that Spirit is conceived as rooted in natural life. Yet in Hegel, nature remains externality and contingency: it is not autonomous but a subordinate "moment" that finds its fulfilment only in Spirit. Pinkard calls this a "Hegelian naturalism," which recognizes nature as necessary but always subordinated to the *telos* of Spirit.

(*Äußerlichkeit, Wiederholung, Zufall*). In short, nature is conceived as deficient, awaiting "redemption" through human reason and historical development[4].

This speculative subordination profoundly shaped the intellectual climate in which the young Marx was formed. Yet Hegel was not Marx's only point of reference: his other early "master" was Ludwig Feuerbach, who sought to overturn precisely this conception of nature and spirit. Rejecting the primacy of Spirit, Feuerbach redirected philosophy to its "earthly ground", affirming nature as the sensuous and material basis of human existence. In this sense, Feuerbach represents a reversal of Hegel's schema: where Hegel saw deficiency, Feuerbach celebrated immediacy; where Hegel subordinated nature, Feuerbach elevated it to the irreducible ground and foundation of human life.

In works such as *Das Wesen des Christentums* and *Grundsätze der Philosophie der Zukunft*, Feuerbach insists that human beings are part of nature (*Teil der Natur*), dependent on it for their existence and consciousness[5]. Yet, in treating nature as an eternal and transhistorical essence, Feuerbach falls back into another form of naturalism: nature appears as a given "essence", an unchanging ground against which history unfolds. This approach denies the fundamental historicity of natural-social relations and risks projecting a timeless essence onto what are in fact socially mediated processes[6].

The contrast between Hegel and Feuerbach illustrates two opposed ideological uses of nature. For Hegel, nature is devalued as contingency and subordinated to the progress of Spirit; for Feuerbach, it is absolutized as the eternal ground of sensuous life. In both cases, however, the category of "nature" serves ideological functions: it either legitimizes the subordination of natural processes to historical development or elevates them into an a-historical abstraction.

Both perspectives thus remain inadequate to the task of grasping the historically mediated relation between society and nature. They oscillate between depreciation and idealization, domination and romanticization. Hegel's emphasis on history and *mediation*, despite its idealist form, made it possible to conceive nature as a dynamic pro-

[4] See Beiser 2005, pp. 173-185, for an overview of Hegel's conception of nature as subordinated.

[5] Feuerbach 1967–, vol. 9, Grundsätze der Philosophie der Zukunft, § 2. See also Pinkard 2002; Jaeschke 2004.

[6] On Feuerbach's naturalism and its limits, see Pinkard 2002 and Jaeschke 2004.

cess rather than a static given totality. On the other side Feuerbach's insistence on "sensuousness" (*Sinnlichkeit*) reintroduced material dependence on natural processes. Yet neither thinker accounted for the concrete ways in which *social relations* and the structure of human production organize and transform the natural world. The ideological character of their approaches lies precisely in this distortion: nature becomes either a deficient "otherness" to be overcome or an eternal essence to be celebrated, but in both cases it remains external to the specificity of "practical human- sensuous activity" (*praktische menschlich-sinnliche Tätigkeit*)[7].

By critically engaging with these traditions, Marx was able to reframe the problem: he retained from Hegel the notion of *mediation* and from Feuerbach the attention to *immediacy* and sensuous materiality, while rejecting their respective *idealist* and *naturalist* reductions. In fact, what emerges in Marx is not a philosophy of nature in the traditional sense, but a critique of the ideological functions that the very category of nature performs in philosophy and political economy. This shift lays the groundwork for a new perspective: one that simultaneously historicizes and naturalizes the material basis of human life[8].

3. *Marx and the Critique of Naturalism*

To understand what is meant by "*ideology of nature"* – and what it means to subject it to critique – we must first clarify, albeit briefly, Marx's own concept of ideology. According to Marx, ideology cannot be reduced to a mere distortion or to a subjective illusion, but possesses the consistency of an "objective appearance" (*objective Erscheinung*)[9]. It is not simply a mistaken representation, but an "objective form of appearance," rooted in the material relations of production and social reproduction[10]. As Marx famously puts it in *The German Ideology*:

[7] Marx, *Thesis on Feuerbach (V).*

[8] See Khurana 2024, pp. 881-901.

[9] The expressions of "*objektive Erscheinung", "objektive Gedankenform*" appear in *Kapital* I, *MEW* 23, 90-91 "*notwendige Erscheinungsform*" in *Kapital* I, 94-95; *Kapital* III, 825.

[10] Jaeggi 2018, ch. 6, for an account of how Marx's materialism allows for a critical perspective on the ideological uses of "nature." See Menke 2022, pp. 201-215, where Marx's critique of abstract rights is linked to a broader critique of naturalism.

"The production of ideas, of conceptions, of consciousness, is at first directly interwoven with the material activity and the material intercourse of men, the language of real life"[11]. Ideology is therefore not a "veil" – like the Schopenhauerian "Veil of Maya" – that conceals reality, nor a merely contingent and secondary "superstructure" (*Überbau*), but an element deeply *embedded* within the "structure" (*Basis*) itself: the very form in which social reality is organized, reproduced, and thus even subjectively experienced.

From this standpoint, Feuerbach's vision of nature emerges as a form of *naturalist materialism*: nature is conceived as a pure and uncontaminated totality, entirely separated from history and from human *Praxis*. What appears as an affirmation of the materiality of existence contains in fact the ideological projection of harmony and reconciliation onto an abstract "nature" detached from material and social relations.

Against this background, Feuerbach's naturalism cannot be dismissed as a theoretical mistake; rather, it must be understood as the ideological expression of a specific political and historical position. In fact, Feuerbach's withdrawal from political engagement in the years of the *Vormärz* – a time of revolutionary ferment and struggles against the *Restoration* – was not a purely personal decision but a political stance consistent with his philosophy. His retreat into the "contemplation of nature" was the subjective form in which a broader ideological *escape* from history and society was enacted. This ideological dimension becomes clear in Feuerbach's exaltation of nature as a site of reconciliation and "cosmic harmony". In a diary entry written after moving to Blankenberg in 1845, Feuerbach described the experience of walking along the seashore:

> When this morning, so excited, I walked along the sea, when I felt myself powerfully drawn in by the waves amid the throbbing of nature, which dissolves everything, then such clarity, such peace, such love arose within me as never before: the magnificent nature outside pushed me inward into my own nature, and this very nature of mine was completely resolved into one great human love. I felt in harmony, in full harmony with nature and with humanity[12].

[11] Marx & Engels 1976, p. 36.
[12] Schuffenhauser 1972, p. 356.

Nothing could be further from a Marxian perspective. What Feuerbach experienced as reconciliation with nature was, from Marx's standpoint, an ideological withdrawal: instead of confronting the contradictions of history, Feuerbach projected an image of nature as harmony and redemption. Here, nature functions as a contemplative refuge from social turmoil, a timeless and reconciled "essence" opposed to the pain and contradictions of history and society. As Marx and Engels remarked in *The German Ideology*:

> In such cases, then, Feuerbach never speaks of the human world but always takes refuge in external nature (*äußere Natur*), specifically in that part of nature that has not yet been subjected to human domination (*Herrschaft der Menschen*). However, every new invention, every advancement in industry, takes away another piece of this ground, and thus, the space on which examples supporting such Feuerbachian claims can arise becomes increasingly limited[13].

From this standpoint, Feuerbach's naturalism appears in a new light. His retreat into *äußere Natur* – "external nature" – is, for Marx, a symptomatic ideological stance: what Feuerbach calls "reconciliation" with nature is in fact a contemplative withdrawal, sustained precisely by abstracting from the historically transformed conditions of social life. At first glance, Marx's critical remarks on Feuerbach could be read as a complete dismissal of nature in favour of unrestrained industrial progress. Yet, such an interpretation would be misleading. Marx's critique is not directed against nature as such, but rather against the ideological function it assumes when elevated into an external, harmonious essence opposed to the complex dynamic of history and social development. His point is that there is no "untouched" or "pristine" nature outside history, since the human relation to nature is always already mediated by social *praxis* and – as Marx specifies in the *Grundrisse* – by a determinate "form of society" (*Gesellschaftsform*): in particular, in the capitalist *form of society*, the entirety of social–natural relations is subsumed under the logic of value.

Thus, Marx rejects both the "idolatry of nature" characteristic of reactionary rural romanticism and the bourgeois glorification of industry as the sole bearer of progress. Both produce ideological ef-

[13] Marx & Engels 1976, p. 63.

fects: the former by imagining an eternal natural harmony, the latter by erasing the ecological and social contradictions inherent in capitalist development. Against both positions, Marx insists that human freedom requires a transformation of social relations of individuals between each other and with nature, not an escape into an idolized "external nature." The path he envisions is not *nostalgic regression,* but the conscious reorganization of society beyond capitalism, thereby laying the groundwork for a non-alienated relationship with nature[14].

From this angle, the conception of nature as the "other" – to be preserved in its pure heterogeneity or as a refuge from modernity – emerges as a fully ideological projection. It conceals the social structures of domination that shape both society and the external nature. In this sense, Marx's critique of Feuerbach illuminates a broader point: the ideology of nature does not lie in an innocent misrepresentation of the world, but in the projection of harmony and reconciliation onto an abstract "nature". What is needed instead is to recognize that nature is inseparable from the social relations that mediate it. Only then can the critique of ideology open the way toward a conception of nature not as an ideological mythical refuge, but as the *basis* of human freedom and collective emancipation.

4. *Ideology of Nature Today: conservationism and resourceism*

One of the most persistent motifs of this ideology is the myth of pristine nature[15]. Despite Marx's critique of such abstractions in Feuerbach, the image of an original, pristine, and harmonious nature corrupted by human intervention continues to inform contemporary ecological discourses. Two dominant orientations stand out: conservationism and resourceism. At first glance, these approaches appear opposed – one idealizes nature, the other instrumentalizes it – but both reproduce the same ideological structure identified by Marx:

[14] Marx develops this alternative conception of the human-nature relation only in his mature works, beginning with the *Grundrisse* (1857-58) and the *London Notebooks* (1850s), where he introduces the concept of the "metabolism" (*Stoffwechsel*) between society and nature. This idea reaches its systematic expression in *Capital*, especially in Book III, where Marx speaks of the "rift" (*Riß*) in the metabolic interaction caused by capitalist production. See Saito 2017; Foster 2000.

[15] On the myth of pristine nature see Cronon 1995, pp. 69-90.

they externalize nature and mystify its socio-historical mediation. It is on this basis that a whole tradition of conservationism developed. Figures such as John Muir, inspired by Alexander von Humboldt and the transcendentalist movement, promoted the idea of nature as a "moral and spiritual resource", a site of purity that could elevate the human spirit[16]. This vision crystallized in the concept of "wilderness", understood as wild and pure nature, entirely separate from human life. It was precisely on this foundation that the first national parks were created – Yellowstone in 1872 in the United States and *Royal National Park* in 1879 in Australia – which entailed the violent displacement of indigenous peoples from their ancestral lands[17]. The institutionalization of "wilderness" culminated with the 1964 *Wilderness Act*[18], which laid the groundwork for the *National Wilderness Preservation System* in the United States. Today, the same concept circulates globally and is often mobilized by the tourism industry, where wilderness is commodified as the promise of access to "untouched" places[19]. What appears as an appeal to protect nature thus implies an ideological separation between the "human world" and the "natural world," concealing their historical interdependence.

On the opposite side of the ideological spectrum stands resourceism, which reduces nature to a stock of usable materials to be quantified, optimized, and exploited. This paradigm, which has dominated environmental policy and mainstream economics throughout the twentieth century, conceives nature primarily as a reservoir of raw materials or "ecosystem services" to be managed in the interests of society. Forests are redefined as "carbon sinks," rivers as "water reserves," biodiversity as "natural capital." The language of resourceism reflects an instrumental ontology in which nature and environmental conditions are always already a means to a productive end. As Neil Evernden has sharply observed in *The Natural Alien*, "By describing everything as a resource, it seems there is a reason to protect it. In truth, however, resourceism transforms all relations with nature into a mere subject-object relationship, of user and used." What resourceism

[16] Muir 1911. On Muir's role and the influence of transcendentalism on the formation of conservationist ideology, see also Nash 1967.

[17] Spence 1999.

[18] Frome 1974.

[19] Urry 1995, pp. 132-156.

presents as protection is in reality the extension of commodification into the ecological sphere, reducing natural processes to interchangeable units of value. This framework is reinforced by the rise of ecological economics in the 1990s, where the concept of "natural capital" sought to integrate environmental concerns into market calculation[20]. Far from challenging the destructive imperatives of capitalist accumulation, such approaches depoliticize the ecological crisis, transforming it into a technical matter of cost-benefit management and efficiency optimization.

Although they appear opposed – one idealizing nature, the other instrumentalizing it – conservationism and resourceism share a common ideological core. Both detach ecological problems from their social roots: conservationism imagines a pure nature corrupted by society, while resourceism treats nature as an external stock to be managed. In both cases, the contradictions of the capitalist mode of production disappear from view. Ecological crisis is depoliticized: it becomes either a matter of preserving harmony or of optimizing flows, rather than confronting the social forms that produce destruction.

From a Marxian perspective, this dualism is continuous with the ideological gestures already visible in Feuerbach and his contemporaries. Like Feuerbach's projection of an uncontaminated external nature, conservationism offers a contemplative refuge from history and society. Like Hegel's subordination of nature to Spirit, resourceism reduces nature to a means, subsuming it under an abstract principle – here, the logic of value. In both cases, the concept of nature is mystified. The task is therefore to undertake a rigorous critique of these ideologies: nature is neither an untouched sanctuary nor a mere stock of resources but a field of processes always mediated by social relations. To reveal this is to recognize that ecological crisis cannot be resolved through nostalgic preservation or technocratic management. What is required instead is a *dialectical naturalism*[21]: a perspective that acknowledges natural constraints while situating them within the social relations that govern their reproduction.

[20] Evernden 1999, p. 101. For the notion of "natural capital" and its limits in economic discourse, see Daily 1997. For an overview of modern environmental ideologies, see Dryzek 2013, chs. 2-3.

[21] See Khurana 2022, pp. 203-221.

5. *Conclusion: Towards a Dialectical Naturalism*

The genealogy reconstructed here shows that the "ideology of nature" is not an accidental distortion but a structural and objective form through which philosophy and politics have mediated the human relation to the natural world. As we have seen, in Hegel, nature is subordinated to Spirit, a deficient moment to be *aufgehoben* through historical development. In Feuerbach, by contrast, it is absolutized as the eternal ground of sensuous immediacy, detached from mediation and history. Marx's originality lies in the critical inversion of both perspectives. He criticizes Hegel from a Feuerbachian standpoint, reaffirming nature and sensuousness (*Sinnlichkeit*) in their immediacy as the irreducible material basis of human life. Yet he also turns Feuerbach against himself from a Hegelian standpoint: this materiality exists only through the historical mediation of labour, production, and social interaction. In doing so, Marx not only preserves Hegel's insight into reality as a historical-dialectical totality; he also maintains Feuerbach's intuition of nature as an irreducible ground of existence in its *non-identity* with social forms. In this double movement, Marx achieves a form of *dialectical naturalism* that transcends both idealist subordination and naturalist immediacy: nature is neither an abstract otherness to be overcome nor an immutable essence to be revered, but a dynamic field of *praxis*, transformation, and reciprocal dependence.

This conception remains decisive today. Contemporary ecological ideologies – whether the romantic idealization of "wilderness" or the technocratic reduction of "natural capital" – reproduce the same separation between humanity and nature that Marx sought to overcome. Against these mystifications, the task is not to restore a lost harmony nor to refine mastery, but to consciously reorganize the social relations through which nature is mediated. The core question, then, is not to perfect domination but to master our relation itself – as Benjamin once wrote "not mastery over nature, but mastery of our relation to nature."[22]

[22] Benjamin 1996, p. 487.

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Nature As Use Object: A Materialist Ecology

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Abstract

Marx is often criticized for being an anti-ecological thinker. Specifically, he is critiqued for having supposedly reduced the value of nature down to its ability to be used by a future communist society. However, in these critiques very little attention is ever paid to what Marx actually means when talking about "using" nature. Marx explicitly distinguishes between two types of uses of nature: human and mere use. Human use can range from crafting a natural object into a useful object, to simply seeing or touching a natural object. Mere use involves abstracting away an object's individual, material qualities, which I argue is exactly what the "ecologically minded" critiques of Marx end up doing. After distinguishing between these two uses in Marx's work, I then turn to his dialectic between egoism and asceticism to demonstrate that Marx does not support egoist uses of nature, but nor does he support ascetic self-denials when it comes to the natural world. Ascetism undergirds the idealist conception of nature that precludes a class-based struggle for environmental justice.

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Constantly in contemporary ecology, we are implored to return to nature in-itself – to stop viewing nature as an object of use for mankind and consider it as something that exists entirely separate from humanity, with its own particular existence and interests. This is exactly the critique that Alfred Schmidt brought against Marx in his book *The Concept of Nature In Marx*, arguing that Marx sees na-

ture only as an object of use for the community of free producers. According to Schmidt, nature is not allowed to exist on its own terms in Marxism and instead exists so that the free proletariat may use, exploit, and degrade it. Yet, this nature in-itself is an idealistic term that has no material correlate. There is, by definition, no "nature in-itself" that I can point to and experience as this "in-itself" is supposed to exist ontologically and epistemologically separated from myself. In returning to the early Marx, where he most clearly gives a definition of what he means by nature existing for human use, we see that Marx's materialist ecology is essential in any true valuing of nature. For Marx, nature exists as real and valuable *through* my material interactions with it, rather than through idealistic abstractions of nature. These abstractions are nothing other than an extension of bourgeois ideology and the capitalist moralism that demands self-denial and asceticism over materialist solidarity.

1. *Use And Mere Use*

Before delving into Marx's discussion of the use of nature in the *Economic and Philosophic Manuscripts*, it is important to first discuss how the early Marx understood the dialectical interplay between man and nature. An earlier draft of this paper examined the later Marx's notion of metabolism, specifically John Bellamy Foster's interpretation of it, in order to show a continuity between the later and early Marx's metaphysics and valuing of nature. However, due to length constraints, I will limit my argument to examining a more early Marx and demonstrating how his opinions are at least not in contradiction with the later Marx. As we can see in the *Manuscripts*, the young Marx was very concerned with the sensuous experience of nature:

> Each of [man's] human relations to the world–seeing hearing, smelling, tasting, feeling, thinking, being aware, sensing, wanting, acting, loving – in short, all the organs of his individual being… are in their *objective* orientation or in their *orientation to the object*, the appropriation of the human world; their orientation to the object is the manifestation of the human world.[1]

[1] Marx 1988a, p. 106.

Without going into the details of the later Marx's use of metabolism, we can at least see a similarity between it and the early Marx's working out of the nature-man dialectic. Human labor, conceived here to include all general human action, mediates human beings' relationship to nature. In *Capital,* he similarly describes labor as "first of all, a process between man and nature, a process by which man, through his own actions, mediates, regulates and controls the metabolism between himself and nature. He sets in motion the natural forces which belong to his own body… in order to appropriate the materials of nature in a form adapted to his own needs."[2] Drawing on Kant, Marx conceives of the object not as passive and transparent, giving itself entirely over to human consciousness, but rather as existing dynamically, a thing in-itself that only appears for humans through an act of labor–actively seeing, hearing, feeling, smelling. Labor manifests a "human world," a world where the object exists not in-itself but for humans through the act of labor. Following Feuerbach's "new materialism," Marx constructs a materialism where the object has an independent existence while simultaneously having a "for-us" existence.

It is because the external world is able to be mediated by human labor that human consciousness is able to find realization in it. For man, "all *objects* become for him the *objectification of himself,* become objects which confirm and realize his individuality."[3] Without material reality, man remains abstract – there is nothing for him to be grounded in. In mediating himself and the external world through labor, man finds a theater in which his actions become real and actual: "To recapitulate: man is not lost in his object only when the object becomes for him a *human* object or objective man."[4] Man becomes real through his interaction with material reality.

Schmidt took this early formulation of the nature-man dialectic, of the interaction between the two sides forming a "human world," to be immature and contradicted in Marx's later writings.[5] For Schmidt, the human-world formulation granted a reconciliation of nature and man that was not present in Marx's later works. According to Schmidt, nature must exist as entirely alien to humans for it not to

[2] Marx 1990, p. 283.
[3] Marx 1988a, p. 108.
[4] Marx 1988a, p. 107.
[5] Schmidt 1971, p. 137.

constitute an idealism. However, Schmidt forgets that this reconciliation between man and external nature is never total; there is still a remainder that is left out of the early Marx's reconciliation. The human world is a *human* world insofar as there is an external world that human reality cannot account for. External reality remains external–only we receive a mediated form of it through labor. Schmidt's rejection of the early Marx for being too immature does not hold. Again, charting the evolution of Marx's man-nature dialectic throughout his entire body of work is a task that cannot be accomplished here, but it should be noted that John Bellamy Foster certainly seems to understand the later Marx's dialectic in a very similar way: "According to Marx, we transform our relation to the world and transcend our alienation from it – *creating our own distinctly human-natural relations – by acting* [emphasis my own]." [6] Nature, for Marx, is always a sensuous nature, one that can be pointed to and labored upon. The external nature of Schmidt, which exists in a totally separate realm from human beings, is alien to Marxist materialism.

With this preliminary discussion of the human world out of the way, we can now turn toward Marx's understanding of the term "use". More specifically, the difference that Marx makes explicit in the *Manuscripts* between nature being utility and it being *mere* utility:

> The eye has become a *human* eye, just as its *object* has become a social, *human* object – an object emanating from man for man. The *senses* have therefore become directly in their practice *theoreticians*. They relate themselves to the *thing* for the sake of the thing, but the thing itself is an *objective human* relation to itself and to man, and vice versa. Need or enjoyment have consequently lost their *egotistic* nature, and nature has lost its mere *utility* by use becoming *human* use.[7]

The fundamental relationship that human beings have to external nature is one of use, as Marx describes all sensuous experiences of the external world as a use relationship. In looking at a stream in the forest, I am always using it in some fashion–I am using it for aesthetic enjoyment, in order to find sustenance, etc. We have already discussed that for Marx, human life is not passive; even when I am seemingly idle, my nervous system is undergoing the activity of

[6] Foster 2000, p. 5.
[7] Marx 1988a, p. 107.

sensing the world around me. This activity, in turn, always seems to be goal-directed. Even if you are lost in thought and your eyes merely happen to be pointed in the direction of the stream, there is still something being achieved here. You are in the first place implicitly always already placing yourself against the world around you in order to exist as a differentiated subject, a paradigmatic example of dialectics, but also, in directing your eyes in the direction of the stream, even when it is done without conscious though or any explicit goal in mind, you direct your eyes there because your eyes must be directed somewhere. The action of directing your sight somewhere is an implicit end in itself.

Already, we can see how this form of use does not exist egotistically, nor does it imply any exploitation of nature whatsoever. The usage of nature most certainly can be exploitative, but it can also range from neutral to positive as well. When sensuous activity itself is defined as usage, then activities such as cleaning a river, chaining yourself to a tree to stop its destruction, and a whole host of ecologically minded activities are also understood as activities in which human beings are using nature. What's more is that the usage of nature is itself a precondition for being able to value nature. Marx's critique of capitalism in this early manuscript is that it degrades the senses and, in turn, degrades the ability to view nature as being something other than *mere* use. His example of a mineral merchant is instructive: "For the starving man, it is not the human form of food that exists, but only its abstract being as food; it could just as well be there in its crudest form... [Similarly] the dealer in minerals sees only the mercantile value but not the beauty and the unique nature of the mineral; he has no *mineralogical sense.*"[8] Foreshadowing his critique of the commodity in *Capital*, Marx derides capitalism for taking what is unique and individual about a natural object and turning it into an abstract exchange-value. The use, the way in which I interact with the object, the way it looks, smells, sounds, and tastes, is either reduced or gotten rid of completely in favor of its abstract monetary value as a commodity. Specifically, with the mineral (a natural object), the "beauty and unique nature" are replaced with a dollar amount. The *mere* use of an object is to make the natural object abstract and unreal, whereas the *human* use is what actualizes the object and brings it into the human

[8] Marx 1988a, p. 109.

world. Without this human use, there is no nature that I can materially point to or value. It is just some alien object that exists entirely separate from my experience, just as it does in the case of mere use.

Marx clearly is not interested in a "nature in-itself," or in nature as an abstract entity that exists separately from human experience. Marx rightfully mocks such philosophers who take up the mantle of nature in-itself in his later work, not because they value nature, but because they have romanticized nature into something unreal. A good example is his review of Herr Daumer's book *Die religion des neuen Weltalters*. In this book, Daumer derealizes nature entirely, turning it into a mere vehicle for his patriarchal ideology: "*Nature* and woman are the really divine, as opposed to the *human* and to man… The sacrifice of the human to the natural, of the male to the female is… the highest, nay, the only virtue and piety."[9] Marx then responds:

> Herr Daumer flees before the historic tragedy that is threatening him too closely to alleged nature, i.e. to mere rustic idyll, and preaches the cult of the female to cloak his own effeminate resignation. Herr Daumer's cult of nature, by the way, is a peculiar one. He has managed to be reactionary even in comparison with Christianity… he achieves nothing but Christian-Germanic patriarchal drivel on nature.[10]

Schmidt himself analyzed this review and took it as a sign that Marx had begun to mature, that he put aside Feuerbach's "cult of nature" and instead took up the concrete business of analyzing political economy. In the review, Marx went on to say that industrial modernization is a beneficial next step for humanity, and Schmidt paraphrases him as such: "Real humanism is not concerned with ultimate metaphysical concepts, whether idealist or materialist. The social emancipation it strives for serves the interest of real, individual men." [11] Schmid thus takes this review to be a movement in an anti-ecological direction for Marx, since he values the interests of men and views nature as being able to supply industrial modernization with raw materials. In Schmidts analysis, "real humanism" that strives for social emancipation can only be ecological if it adds environmental

[9] Daumer qtd in Schmidt 1971, p. 131.
[10] Schmidt 1971.
[11] Schmidt 1971, p. 133.

liberation as additional and fully *parallel* into its program. Even then, too much emphasis on the human could be construed as "anthropocentric" and anti-ecological.

What Schmidt fails to consider is that it is actually anti-ecological to take *real existing* nature, nature as the concrete sense experience of one particular mineral with its concrete beauty and unique nature, and then turn it into an abstraction that can then carry your own preconceived ideology. True materialist ecology does not have time for abstract nature in-itself; it is concerned only with nature that is actual, that can be seen, felt, heard, and tasted. It is not in pinning for an external nature that exists in a separate world from human beings that ecology takes root. The nature that exists as being worthy of preservation, conservation, or whatever ecological attitude we want to place here, is the nature that I see every day, that I labor upon, and that provides me with my own self-realization. The external natures of both Schmidt and Daumer are ideological in nature and actively turn nature into a *mere* thing – something that is deified and non-actual. In claiming that nature exists not as "mere utility" but as "*human* use," Marx claims nothing other than that actualized nature is the basis of materialist ecology.

2. *Asceticism and Egoism*

We can see further the harm of the idealist ecology of Daumer and Schmidt through the dialect of asceticism and egoism that Marx discusses in *German Ideology* and somewhat in the *Manuscripts*. Despite the common understanding of communism, of it being the unnatural suppression of the "human instinct" towards selfishness for the betterment of the collective, egoism is not totally negated by Marxian communism. As Marx wrote in *German Ideology*: "Communists do not oppose egoism to selflessness or selflessness to egoism… on the contrary they are very well aware that egoism, just as much as selflessness, is in definite circumstances a necessary form of the self-assertion of individuals."[12] Egoism, self-will, and will to power are all essential to the life of an individual, and the denial of this aspect of human consciousness leads to an unfree self-denial. It was not capitalism that invented this ascetic self-denialism, but it was very much so adopted by the logic of capitalism in its Calvinist form. In capitalism, we have

[12] Marx 1988b, p. 105.

on one side the "*ascetic* but *extortionate* miser" who rises to the top through his thrift and virtuous denial of material wants. On the other side, we have the:

> *Ascetic* but *productive* slave. Its moral ideal is the *worker* who takes part of his wages to the savings-bank. The less you eat, drink, and read books, the less you go to the theater, the dance-hall, the public house; the less you think, love, theorize, sing, paint, fence, etc., the more you *save* – the *greater* becomes your treasure which neither moths nor dust will devour – your *capital*. The less you *are*, the more you *have*.[13]

Self-denial is an inhuman way of life, a way of life that abstracts from the activity of living. To be is to self-assert, and it is no coincidence that Marx's litany of self-assertions mirrors the litany of ways we relate to the natural world – "eating, drinking, reading, going to the theater" is paralleled by "taste, sight, and hearing." The natural world, as said before, is a theater for self-assertion and self-actualization.

But the rejection of asceticism is not the wholesale endorsement of egoism. Just as asceticism denies the necessity of self-assertion, pure egoism denies the necessity of general interest: "'General interest' is created by individuals who are defined as 'private persons'. [Communist theoreticians] know that this contradiction is only a *seeming* one because one side of it, what is called 'general interest', is constantly being produced by the other side, private interest, and in relation to the latter it is by no means an independent force with an independent history – so that this contradiction is in practice constantly destroyed and reproduced."[14] Private and general interests are dialectically related; the collective is made up of individuals, and individuals are comprised by the collective in turn. Individuals are historically determined, actualized by acting upon what is not itself, and exist within a social system that molds them. Individuals create the collective, and the collective creates individuals. Their distinction from each other is "constantly reproduced and destroyed," and thus their interests are as well.

Moreover, the general interest does not just exist as the abstract notion that my well-being is dependent upon the well-being of others, "indeed common interest does not exist merely in the imagination…

[13] Marx 1988a, pp. 118-119.
[14] Marx 1988b, p. 106.

but first of all in reality, as the mutual interdependence of the individuals". The abstract general interest is always reliant on the reality of "real ties existing in every family conglomeration and tribal conglomeration – such as flesh and blood, language, division of labour on a larger scale, and other interests".[15] Marx's formation of the general interest can at first appear as egoism rationalized, egoism that takes others into account, but still with the ultimate goal of promoting its own ends. Yet here Marx makes it clear that common interest doesn't arise out of such an egotistical calculation, but from the social fact of living in relation to other beings. We have real existing ties with others that exist materially our shared states, be that a shared DNA, language, or class position within society. Though Marx resisted and openly mocked the supposed existence of a codified morality, he took relationships and the care that emanates from them to be a material fact of life.

The hope for a solidarity with nature, between the proletariat and the natural world, which are both exploited by the bourgeoisie, rests in this dialectic. The ascetic-egoist dialectic is most easily read as referring to purely human relations, but there is good reason to believe that nature is involved as well. The dialectic arises precisely because general interest and private interest comprise each other, that private interest is implied in general interest and vice versa. This same relationship is acknowledged directly by Marx as being the same for human beings and nature. Marx notes that "the *entire so-called history of the world* is nothing but the begetting of man through human labor, nothing but the coming-to-be of nature for man… man has become for man as the being of nature, and nature of man as the being of man".[16] Man is realized through nature, and nature is realized through man, and so they are just as dialectically intertwined as general interests and private interests. This happens not just abstractly but through an actual, interdependent relationship between man and nature. The relationships between an owner and a pet, a fisherman and the ocean, or a zoologist and the animals they study are concrete relationships in which the collapse between human and non-human interests occurs. The owner of a pet owns them simultaneously for selfish reasons, e.g. for the pleasure that the pet brings into their life,

[15] Marx 1988b, p. 96.
[16] Marx 1988a, p. 113.

but also because they care for said pet, they are bound by a material relationship. The question of being an anthropocentric egoist or self-denying deep ecologist disappears once we recognize man and nature to be in a dialectical, interdependent relationship. Egoism is just as one-sided and false as pure, self-denying asceticism. In understanding my own private interests, I know that they are intertwined with the general interest, which includes nature. In understanding the general interest, I know that it is intertwined with my own private interest. When I fight against climate change, do I do it because I need a planet to live on if I want to continue to live, or do I do it because I don't want to see the deaths of countless species? When I fight for clean water and clean air, do I do it because I need clean water and air, or because everything needs water and air? The answer, in typical dialectical fashion, is not either/or.

Going too far towards ecological asceticism (i.e. ideology) can have two results: the first being a quite literal asceticism where one ventures out into the woods and refrains from any anti-ecological behavior whatsoever; the second being a Herr Daumer esq mistake where one romanticizes an external nature outside of themself and therefore loses the interdependent relationship between man and nature. The first denial assumes that there is an external nature and that all that is required for ecological progress is to change my attitude and my conception of this nature. Along with this comes some behavioral changes, but these are not aimed towards structural change; they are instead aimed towards becoming a virtuous ascetic who may escape *personal* blame for the ecological collapse. One may have to burn fossil fuels on the drive to an organizing meeting or kill a tree in printing off agit-prop – better to stay in the woods where one's ascetic virtue cannot come into question. This asceticism is simply a distraction from the concrete business of destroying the mode of production that is degrading nature – i.e. capitalism.

The second asceticism does not fully deny the possibility of systemic action, but it does erode the possibility of having a personal stake in ecological action. One fights for "nature in-itself" and so any personal connection to the struggle is seen as egotistical – precluding a class basis for ecological struggle. Taking an interest in the environment because you are a worker who needs clean drinking water, clean air, or out of concern for your house sinking in the Atlantic Ocean, is viewing nature on a use-basis rather than as an in-itself.

That the fight for the environment will require serious sacrifices, ones which are hard to justify when your skin isn't in the game, limits this ideology to cursory, minor actions that do not pose a significant challenge to capital. It also limits the base of those who take part in such actions to those who are comfortable enough to feasibly set their own self-interest to the side. Indeed, it is hard to imagine the vast majority of people living paycheck to paycheck taking on an issue that exists entirely separate from themselves.

For human beings, nature becomes actualized only through our use of it, and similarly, human beings become actualized only through their use of nature. The "use-relationship" paradigm that Marx lays out does not reduce nature to a mere end that must always surrender itself to human needs and wants. On the contrary, it is only through actually being in, laboring upon, and using nature that it becomes real and that I am able to form interdependent relationships with it.

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Metabolic or Anthropological Rift? Hegelian Marxism contra Eco-Marxism

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Abstract

This paper argues that Hegelian Marxism offers a more cogent paradigm to think our ecological crisis than the Eco-Marxist paradigm of the "metabolic rift," as articulated by John Bellamy Foster and Kohei Saito. I begin by explaining the thesis of the metabolic rift, and arguing that its most coherent and plausible interpretation is that capital necessarily transgresses natural limits. I then argue that this thesis is false, and that it lacks normative resources to amount to a critique. In the second half of the paper, I develop a positive alternative, by defending the Hegelian-Marxist thesis that what capital contradicts is freedom. After giving a brief account of Hegel's understanding of freedom as Ethical Life, I present and concur with Marx's 1843 criticism that in maintaining a rift between civil society and the state, between the human as *Bürger* and *citoyen*, Hegel limits self-conscious self-determination in the sphere of civil society. I therefore conclude by suggesting that the anthropological rift between *Bürger* and *citoyen* remains more relevant than the so-called metabolic rift as the main contradiction to be overcome. Even in the interest of sustainability, it is crucial to maintain, in the Hegelian-Marxist line, that what capital contradicts is not nature, but freedom.

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Keywords: Metabolic Rift, Marx, Hegel, Nature, Freedom

1. *Introduction*

The concept of the "metabolic rift" has taken center stage in Eco-Marxist debates. Spearheaded more than twenty years ago by John Bellamy Foster, and recently further popularized by the bestselling work of Kohei Saito, the concept has become the heading of a veritable school of thought, one that continues to generate a whole host of valuable literature showing the different ways in which capitalism drives our ecological crisis. At the same time, this school purports to put the Western Marxist tradition back on the right track. On many occasions, both Foster and Saito lament how Western Marxism after Lukács became, in their words, exclusively concerned with the pole of the subject – society – and thereby neglected the other pole in the dialectic – the object: nature.[1] This is, in their view, part of that long idealist hangover that Western Marxism simply cannot shake off, and that the pathbreaking paradigm of the metabolic rift is supposed to finally sober us up from. But what exactly is the central thesis of the metabolic rift and is it plausible? Does this school offer better resources to theorize our ecological crisis than Hegelian Marxism? In this paper, I argue that it does not. After presenting the thesis of the metabolic rift, and showing that it is either incoherent or false, I argue that a more promising concept to diagnose the pathologies of modern liberal capitalism – including but not limited to the ecological crisis – can be constructed out of the early Marx's critical engagement with Hegel, a concept that I will call the anthropological rift: the split between *Bürger* and *citoyen*. Not nature, but freedom, must remain the ground of any critique of capitalism.

2. *Metabolic Ambiguities*

What exactly is meant by "metabolic rift"? Let us begin with the concept of metabolism, or *Stoffwechsel*, meaning literally exchange of matter. The term was originally used in 19th century physiology to describe the processes of consumption and excretion undertaken by living organisms. Towards the middle of the century, it became a popular metaphor to describe other processes of material exchange,

[1] Saitō 2022, p. 81; Foster & Clark 2016.

from agricultural chemistry to political economy. Marx himself began using the term in the 1850's, but his use is not always consistent. Following Saito, we can distinguish between three uses. The first and most well-known one comes from Marx's famous description of the labor process in volume one of *Capital*: "Labour is, first of all, a process between man and nature, a process by which man, through his own actions, mediates, regulates and controls the metabolism between himself and nature."[2] The first use of metabolism is thus about the *interaction* between society and nature. Marx's second use of the term metabolism is qualified by the adjective "social": "In so far as the process of exchange transfers commodities from hands in which they are non-use-values to hands in which they are use-values, it is a process of social metabolism."[3] Social metabolism thus refers to the circulation of commodities considered as use-values. The third and final use of the concept is usually qualified by the adjective "natural": "use values … are dissolved by the simple metabolism of nature if they are not actually used."[4] Natural metabolism refers to physico-chemical processes of degradation governed by natural laws that operate independently of human activity. So the metaphor of "metabolism" is used to describe these three quite different processes.

Let us now turn to the concept of a rift. The term comes from Marx, who uses it on a single occasion in the third volume of *Capital*.[5] As is well known, Marx refers there to the process acutely diagnosed by Justus von Liebig of how the overexploitation of capitalist industrial agriculture was robbing the soil of nutrients, which later ended up in the sewers of overcrowded cities with no mechanism for them to circle back; the robbery of the soil's fertility, Liebig argued, was unsustainable, and it was driving European civilization to collapse. This is undoubtedly a suggestive and informative case. But it is not clear why it should be called a rift. A rift is a separation between two things. What are the two things in this case? Both Saito and Foster oscillate between locating the rift *between* social and natural metabolism and *within* the metabolism of nature itself.[6] However, in either case, it

[2] Marx 1990, p. 283.
[3] Marx 1990, p. 198.
[4] Marx 1993, p. 271.
[5] Marx 1991, p. 949.
[6] For examples of both authors making both contradictory points, see Saitō 2017, p. 198; Saitō 2022, p. 24; Foster 2022, p. 27; Foster 2013.

is not clear at all how the image of a rift could be appropriate here. For we saw how natural metabolism refers to the processes that occur governed by natural laws that are non-social, non-historical, and factual. But clearly anything that happens at all must happen within the parameters of those natural laws. It therefore seems incoherent to say that there can be a rift either within natural metabolism, or between natural metabolism and anything else.[7]

More promising is another notion that gets used almost synonymously, though the imagery is quite different: that of a natural limit. It seems more appropriate to say that industrial agriculture pushed the fertility of the soil to its limits, than to say that it caused a rift or separation with the metabolism of nature. But here we come up again against what is essentially the same ambiguity. Both Saito and Foster explicitly describe natural limits as something that *cannot* be overcome, as a matter of fact. Saito writes, for example, that there are "absolute limits of nature which capital cannot overcome."[8] Crossing a natural limit here is a matter of physical, perhaps even metaphysical impossibility. But this clearly cannot be the kind of natural limit that we're interested in. For if a natural limit really cannot be overcome, then it seems like a trivial thing to theorize about. If we set limits to the amount of carbon to be released into the atmosphere, or the amount of degrees that the temperature of the earth can rise, we set these limits precisely because they *can* be overcome: that is precisely the reason why they *should* not. As we have seen with the infamous 1.5 degrees, "the limit is not a limit," as it turns out.[9] The relevant kind of limit is therefore precisely not absolute – whatever that may mean – but relative. Natural limits are not externally given as brute facts, but internally decided on in light of these facts. Our reasons not to overcome them are not physical, but normative. This might seem like a matter of course. But it is common to find in the writings of both authors a dismissal of normative questions.[10] This is important because the contradiction that they diagnose is supposed to be more fundamental than that.

[7] Foster and Saitō also speak about spatial and temporal dimensions of the rift. But this only adds further inconsistencies and ambiguities about why they should be understood as dimensions of the same phenomenon.

[8] Saitō 2022, p. 21.

[9] See Malm & Carton 2024, p. 1.

[10] Saitō 2017, p. 271.

So, what is that contradiction? We can now reconsider the central thesis of the metabolic rift. If this thesis is anything coherent and specific, it is that nature and capital are in a *necessary* contradiction. The argument is simple: whereas capital's drive for valorization is in its very essence infinite – capital's demonic loop M-C-M' has no end – the material substratum on which this valorization process depends is finite. "Since the earth is finite, it is obvious that there are absolute biophysical limits to capital accumulation."[11] Nature is finite, capital is infinite: the contradiction is presented as irreconcilable, metaphysically necessary, almost a priori, like a married bachelor or a square circle. Nature, then (or natural metabolism, natural limits), is turned into an Archimedean point from which capital can be critiqued and resisted. And although, they claim, it has taken time for this contradiction to painfully unfold and intensify into its current fever pitch, it already existed, *in nuce*, between the very "formal logic of capital and the material logic of nature."[12] The metabolic rift school thus implicitly submits a solid, new normative ground for the critique of capitalism: that ground is nature, it is the earth itself.

3. *The Limits of Nature*

The metabolic rift thesis is false, I now argue, for two reasons. First: nature is not finite, at least not in any relevant sense. If the earth is finite, capital goes to space: thus preach the techno-futurists. If resources are limited, they can be recycled and sold again: so argues the green capitalist. If nature's finitude eventually leads economies to stagnate – so tell us the warmonger – there is no better way to reanimate it than through the business of war: both destruction and reconstruction are highly profitable, and capital may resume its orgies. Furthermore, as Saito admits, nature is "elastic": "its limits are ... modifiable to a great extent."[13] Science discloses the internal grammar of nature and technology pushes its limits. The civilizational collapse predicted by Liebig simply did not happen because the Haber-Bosch process was invented, allowing the fixation of nitrogen from the atmosphere,

[11] Saitō 2022, p. 18.
[12] Saitō 2017, p. 295.
[13] Saitō 2022, p. 33.

and with it the artificial production of ammonia and industrial fertilizers. The natural limit to the soil's productivity was dissolved in the blink of an eye. Saito and Foster are of course aware of this history. In their view, however, this was a mere "technological shift," a quick fix that only led to further problems – the contamination of aquifers and oceans, the use of more natural gas and oil, etc. "The invention of new technologies," Saito writes, "cannot repair the rift. The rift remains 'irreparable' in capitalism."[14] This sounds admittedly intuitive. But it is a blunt assertion. The empirical set of problems that followed this invention are simply different from the original one of the soil's exhaustion. My point is not to defend an ecomodernist fantasy of the omnipotence of technology. It is more philosophical: that Saito does not have the resources to distinguish between a "mere technological shift," and a real solution to the rift. Once nature is made elastic it cannot be solidified again to serve as a fixed Archimedean point. We cannot determine the limits of nature's elasticity in advance. If Žižek exaggerates when he says that "nature too melts into air,"[15] it nevertheless seems right to say that nature, when understood, bends to our will, with no a priori limits.

Secondly, the concept of nature is normatively underdetermined. Even if capital did contradict nature, this would not suffice to amount to a criticism. According to Saito the "metabolic rift is ... most fundamentally ... the material disruption of cyclical processes in natural metabolism."[16] By this logic, it would follow that every practice or technology that breaks with some preordained cycle of nature would fall under the purview of this critique; this would include the contraceptive pill and the lightbulb. The metabolic rift thesis thus succumbs to the naturalist fallacy: the conceit that it follows from something being natura – in this case, some vaguely defined natural metabolism – that it is good. Against their pretension to find a critical standard in nature, in the earth, we are reminded of the question posed by Hölderlin in the poem "In Lieblicher Bläue": "Is there a measure on earth?" he asks. No, he answers, there is none.

[14] Saitō 2022, p. 29.
[15] Žižek 2020.
[16] Saitō 2022, p. 24.

4. *The Anthropological Rift*

Is there a measure at all, then? If not nature, then what *does* capital contradict, what *can* serve as a ground for criticism? I want to conclude by suggesting, though this cannot amount to more than a programmatic hypothesis, that the answer must be: freedom, understood as self-conscious self-determination, and that therefore a Hegelian-Marxist framework remains indispensable.[17] Let us begin by noting the first positive insight that should emerge from our determinate negation of the metabolic rift thesis. If critique cannot be grounded in nature, then it must be grounded in some minimally normative unit. Life, as the most elementary being that is teleologically structured, that can set ends for itself, is an initial candidate. Life is very different to the bare idea of nature or natural metabolism. Indeed, if natural metabolism for Marx referred to physico-chemical processes of degradation, life is the exact opposite of that: it is an organization that resists mechanical dispersal; it is not a state of quiet equilibrium, but a disturbance of equilibrium, a negation of entropy. Of course life alone is a very low bar. If every metabolism, every living thing, is disturbed, is a disturbance, then it seems like we need further criteria to decide whether a given disturbance is good or bad. As a matter of fact, we have more robust normative expectations than the mere survival of life in any shape or form. We want life to flourish, we want it to be happy, self-conscious and free. Hegel's concept of objective spirit, as presented, for instance, in his *Philosophy of Right*, is precisely an attempt to make explicit what this "living good,"[18] what the "actualization of freedom… as second nature,"[19] consist of.

I of course cannot summarize the contents of the whole book, how Hegel runs through different conceptions of freedom, shows their limitations and presuppositions until arriving at the most developed form of freedom, *Sittlichkeit.* Instead, let us go straight into the latter, and say very cursorily that it is an account of the three main subspheres of modern societies – the family, civil society and the state – and how through them, societies reproduce themselves not only

[17] Battistoni 2025.
[18] Hegel 2012.
[19] Hegel 2012.

materially but also freely, insofar as particular and universal wills receive an institutional structuring that guarantees their reciprocal self-production. Hegel grasps ethical life as a dynamic process, as a living organism that provides the stable institutional channels for a particular will to first universalize itself in the family, particularize itself in civil society, only to again concretely universalize itself in the state. Now, there are many specifics in Hegel's theory of *Sittlichkeit* that one would be right to take issue with. What I take to be appealing though is his view that freedom cannot be understood merely as sovereignty over the natural world for which the will of another is only a limit (as conceived by abstract right), nor as sheer obedience to the universal moral law to the detriment of my internal nature, my desires and inclinations (as conceived by Kant); freedom must be understood from the perspective of the totality of society, as the dynamic process by which particular and universal wills construct and interpenetrate one another; freedom is the process, both material and ideal, in which an "I" is produced and maintained in both identity and difference with a "we". But Hegel himself failed to reckon fully with the consequences of this conception of freedom when he grasped modernity as a reconciled, rather than a contradictory whole. This, I argue, is the main insight to be gleaned from the Young Marx's 1843 *Critique of Hegel's Doctrine of the State*.

Early on in these unpublished manuscripts, Marx praises Hegel for seeing "that the political state is an organism and that, therefore, its various powers are no longer to be seen as mechanical but as the product of living, rational divisions of functions."[20] Throughout the manuscript, Marx refers approvingly to the Hegelian notion of a "true state," and indeed takes it as a standpoint from which to criticize the falling short of the Prussian state, even in the reformist articulation given to it by Hegel. He nevertheless offers an instructive diagnosis for the shortcomings of Hegel's political philosophy by attributing them to a commitment from Hegel's *Logic*. Marx quotes a remark from Hegel's *PR* in which Hegel says that "It is one of the most important discoveries of logic that a specific moment which by standing in an opposition, has the position of an extreme, ceases to be such and is a moment in an *organic* whole by being at the same time a mean."[21]

[20] Marx 1992, p. 66.
[21] Marx 1992, p. 134.

Crucially, this means for Hegel that it is decided in advance that because society is just such an organic whole, apparent oppositions dissolve into mere appearance.

Marx then goes on to show how Hegel lays bare one such opposition, which he then, in conformity with this logical prejudice, goes to great pains to cover up, dissolve and dismiss as merely apparent. That opposition concerns civil society on the one hand, and the state on the other. Civil society, as we have seen, is the sphere of particularity and economic self-interest, of the material reproduction of life; the state on the other hand is the sphere of universality and political common interest, of freely deciding on the good life. Because these cannot, according to Hegel's organicist conviction, be opposed, they must be somehow mediated. He thus introduces various institutions to fulfill precisely this role. From the side of civil society – and on this point Marx is much less critical – Hegel theorizes the corporation as a kind of grassroot association of workers that from the ground up and out of their fragmented atomization, aggregate and identify their common interests, and therefore form a point of transition into the state.[22] But from the side of the state, Hegel theorizes the second and third branches of government as providing mediation in the opposite direction. The executive, he argues, consists of a bureaucracy that carries out the affairs of the state by profession; because the post is open to anyone (provided they are, of course, male, of age, property-owning), it represents the universality of the state to civil society.[23] Similarly, in the branch of government called the legislative, Hegel presents the estate assemblies – a kind of house of representatives – as what gives the different estates of civil society (the agricultural and the urban working class) a political character: "Just as the bureaucrats are deputies from the state to civil society," Marx glosses, "so too the estates are deputies from civil society to the state."[24] The economic and the political, the natural and the free, are therefore, according to Hegel, thanks to these various institutions, mediated: freedom, triumphant modernity hails, is actualized through them as second nature.

[22] Hegel 2012.
[23] Hegel 2012, §§ 287-297.
[24] Marx 1992, p. 130.

What Marx most ardently disputes in this and other writings from this period, is that these two spheres are indeed reconciled. The modern human being according to Marx is split by what we could call an anthropological rift: "there is an apparent identity, *the same subject,* but it has *essentially different* determinations, i.e. in reality there is a *double* subject."[25] With this diagnosis, Marx links up with the problem, sharply formulated by Kant, of the irreconcilably amphibian character of the human – both object and subject, both natural and free – which the Post-Kantian tradition was constitutively concerned with resolving; a task at which Hegel, according to Marx, fails. The human being, Marx concludes through his critical engagement with Hegel, is indeed split into a natural, and a free determination, but this is not due to an ahistorical fact of the human condition, but rather to the very specific structure of modern societies: the human is split into a *Bürger* and a *citoyen*. Marx identifies the inaugural moment of this split in the French Revolution, where the human being reclaims its freedom, its political existence, as its essence; but achieves this only by relegating its material life, its concrete life, to the realm of the natural, the apolitical, the unfree. Marx makes the point even more forcefully in another essay from the same year, *On the Jewish Question*: "The *constitution* of the *political state* and the dissolution of civil society into independent *individuals*…are achieved in *one and the same act.* But man, as member of civil society, inevitably appears as *unpolitical* man, as *natural* man."[26] As *Bürger*, the human is concrete and material but merely particular; as *citoyen*, it is universal and spiritual but immaterial and abstract. This is the anthropological rift that Marx is able to articulate *with* and yet also in a sense *against* Hegel. And we can already anticipate what a sublation of this contradiction would amount to: that civil society become politicized, that freedom, as self-conscious self-determination, in order to be actual, must expand to our very material relations themselves. If the liberal state is premised on the separation of these spheres, and if the fascist state negates the rift to overtly become an instrument of capital, both are cases of particular interests masquerading in the guise of universality; the opposite negation, the genuine overcoming of the rift, the free and self-conscious determination of all and for all in our material relations, cannot be given another name than communism.

[25] Marx 1992, p. 149.
[26] Marx 1992, p. 234.

5. *Conclusion:*

I do not mean to overblow the importance of these unpublished texts of the Young Marx. But it is essential not to lose sight of them in order to appreciate to what extent Marx remains indebted to a Hegelian understanding of freedom, as much as he seeks to rework and expand it. For without an articulation of this commitment to freedom, his later work becomes unintelligible. We have seen this exemplarily in the Eco-Marxist tradition that attempts to grasp the central contradiction theorized by Marx as involving nature and capital, or nature and civil society (as ruled by capital). I have tried to show the fundamental philosophical and political problems that this position quickly runs into. The central contradiction of civil society under capitalism, I maintain, is not with nature, but, as it were, in the other direction, with freedom. This theoretical lens is more fruitful even but not exclusively to grasp our ecological crisis. For the real philosophical mystery is not that capital continues to undermine the sources of all wealth – the earth and the worker – and is thereby turning the planet into a living hell, a fact that is well-known, well-documented and scientifically beyond real controversy. The real riddle continues to be that we seem unable to do anything about it, that the mute compulsion of capital imposes itself with iron fist on the workers even though it is made by workers; the comprehension and negation of that riddle is therefore still the main task for Marxist philosophy and politics. For this, the Hegelian notions of freedom and alienation remain the indispensable background. At the risk of ending up with an Eco-Marxism that confuses materialism with vulgarity, and that dubiously posits nature as something good in itself, it is essential to preserve a Marxism that overcomes Hegel in the right way, that is to say, from a place of extreme proximity. For their fundamental commitment is and remains the same: universal emancipation.

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"Environment"
On Friedrich Engels' Critique of an Evolutionary Concept

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Abstract

This contribution offers a historical analysis of the concept of "environment", emphasising its philosophical, scientific, and political implications in Friedrich Engels' critique of evolutionary natural philosophy. Central to the discussion is Engels' interpretation of Darwinism in *Dialectics of Nature*, where he distinguishes between "adaptation" and the "struggle for existence", opposing the Malthusian and social-Darwinist reduction of evolution to competition. The contribution argues that Engels assumes the evolutionary definition of "environment" not as a static backdrop but as a dynamic field of interaction, and then integrated it with reference to human labor and production. Thus, Engels offers a materialist critique of dominant evolutionary narratives, exposing the ideological dimension of their a-historical application to social relation, at the basis of the legitimation of inequalities.

Bio: My research interests span from Malthus to Malthusianism, from the birth of ecology as a political and social movement to theories of the Anthropocene and Artificial Intelligence. On these topics I published a book for il Mulino (2025) and scientific articles for Italian and International journals.

Keywords: Environment, Engels, Malthusianism, Evolution, Labour

1. *From "Ape" to "Man"*

A historicisation of the concept of "environment" is crucial to laid the ground for assessing its philosophical, scientific, and political implications.[1] Starting from evolutionary re-semantisation, "environment" began to refer to the connection between humans and nature, understood as the object of a new scientific and political knowledge aimed primarily at legitimising order as the result of a process of adaptation. Nowadays, expressions such as "climate crisis" and "ecological catastrophe", as well as concepts such as "Anthropocene" and "Capitalocene", reveal the inadequacy of an order paradigm that has historically relied on this very definition of the environment. The historical and conceptual intent of this contribution is therefore to examine the seminal evolutionary definition of "environment" together with its critique proposed by Friedrich Engels. What is at stake is the possibility to observe how "environment" has given normative meaning to the relationship between humans and nature, and how historicising this relationship has been the first step towards criticising the neutralisation and naturalisation of social conflicts that resulted from it. To this end, this contribution reconstructs the formation of a new, evolutionary knowledge on the interaction between humans and nature, and then assesses Engels' immersion in that intellectual laboratory to criticise the a-historical application of those lenses to history and politics.

In the first half of the 19th century, variegated fields of knowledge – from physics to biology, from morals to sociology and politics – and authors belonging to different linguistic and semantic fields – at least, German, English, and French – contributed to the evolutionary re-semantisation of the concept of "environment" (in French *milieu*, in German *Umgebung*). With this contribution, I will only briefly touch on those texts and authors, to try to single out the role of the concept of "environment" in the process of formation and formalisation of evolutionary sciences. This is a step towards understanding the political meaning of Engels' critique of that concept in his *Dialectics of Nature* (1882). This implies that, by approaching Engels' text, I won't try to establish the possibility to find in it some sort of an "ecological conscience" before the "Anthropocene", nor to deal

[1] Benson 2020.

with Engels' definition of dialectics, so to single out his intellectual relationship with Hegel.[2] There is an already established scholarship on both these topics, so my choice is rather to highlight an important feature of Engels' immersion in the evolutionary "laboratory" of definition of "environment": going back to the theories developed by natural scientists was instrumental in contrasting their a-historical application to the realm of society. In order to do so, two relevant quotations from Engels' work constitute a valuable starting point for this brief pattern.

These are the quotation from *Dialectics of Nature*, in particular I refer to the chapter entitled *The Part Played by Labour in the Transition from Ape to Man,* which Engels wrote in 1876, and to the unfinished notes on Biology. In 1876, Engels stated:

> Animals, as has already been pointed out, change the environment (*Umgebung*) by their activities in the same way, even if not to the same extent, as man does, and these changes, as we have seen, in turn react upon and change those who made them. […] But animals exert a lasting effect on their environment unintentionally and, as far as the animals themselves are concerned, accidentally. The further removed men are from animals, however, the more their effect on nature assumes the character of premeditated, planned action directed towards definite preconceived ends.[3]

Then, in the "Notes on biology", Engels affirmed what follows:

> *Struggle for Existence.* Above all this must be strictly limited to the struggles resulting from plant and animal *over-population*; […] but one must keep sharply distinct from it the conditions in which species alter, old ones die out and newly evolved ones take their place, without this over-population. […] If there the individuals which become adapted survive and develop into a new species by continually increasing adaptation, […] this can and does proceed *without any Malthusianism.* […] The whole Darwinian theory of the struggle for existence is simply the transference from society to organic nature of Hobbes' *bellum omnium contra omnes* and of the economic theory of competition, as well as the Malthusian theory of population. When once this feat has been accomplished, it is very easy to transfer these

[2] Kangal 2020; Saito 2023.
[3] Engels 2010a, p. 471.

> theories back again from natural history to the history of society, and altogether too naive to maintain that thereby these assertions have been proved as eternal natural laws of society.[4]

The first quotation shows Engels' understanding of the radical change happened in natural sciences imposed by evolutionary theories: the living cannot be understood anymore as part of a fixed nature, but it is to be assessed as part of a changing environment on which any organism act upon, and which in turn reacts on every living being. The separation between men and animals or plants is due to the ability of the formers to use the hand and to speak – as Engels confirms in another passage of that chapter – which give them the ability to plan their activity and transform intentionally the environment they are part of. The second quotation on the "struggle for existence" is a direct critique of social Darwinism, the widespread doctrine which sought to transplant that concept from nature to society by contaminating it with Malthusianism[5]. Engels, in other words, proposes not to overlap natural selection for overpopulation and adaptation, two fundamental categories used to explain evolution, but to distinguish them. Adaptation and heredity can start a process of evolution of organisms and living beings for adaptation to their environment. This distinction, which Engels can advance as a result of his studies of Jean-Baptiste Lamarck, Charles Darwin and Ernst Haeckel, is the tool he chooses to criticise that strand of social evolutionism which attempts to reduce evolution to a struggle, thus justifying existing market relations of domination, or to reduce "environment" to a given, natural and social dimension to which only the fittest can adapt to. To criticise this ideological operation is one important political stake of Engels' immersion in natural sciences.

2. *The Evolutionary Definitions of "Environment"*

In 1828, the essayist Thomas Carlyle translates Johann Wolfgang von Goethe's text entitled *Aus Meinem Leben, Dichtung und Wahrheit* (1814) from German, in English, using the term "environment" for the first time to translate the lemma *Umgebung*. The choice would not

[4] Engels 2010a, pp. 572-573.
[5] Schmieder 2011; Hale 2014; Bonasera 2025.

be without consequences. In 1853, in fact, Harriet Martineau, when translating Auguste Comte's *Cours de philosophie positive* (1830-1842) for British readers, again uses the term "environment", this time to translate from the French *milieu*. In the Fortieth lecture of the *Course*, Comte assigns a certain relevance to the *milieu* for grasping the relationship between organisms and the external circumstances in which they develop their faculties. In particular, when dealing with the difficult task to find a synthesis between the biological knowledge of humans and that of the external conditions in which they develop their faculties, Comte writes: "the life of any living being in any environment [milieu] becomes impossible when the environment suffers from radical perturbations […] plants and animals can barely change their environment; men, on the other hand, can stand more complex variations thanks to the ability to react on the environment".[6] Even before Comte, in his *Philosophie zoologique* (1809), Jean-Baptiste Lamarck conceived the living being as an always provisional result of the dialectic of relations with its environment; the two laws he introduces in that volume – of the use and disuse of organs, and of the heredity of acquired characters – are possible only in light of his new conception of the environment. *Milieu,* for Lamarck and then Comte, becomes the necessary support and irreplaceable stimulator of vital functions, which without it would not be able to manifest themselves even at the most basic levels. So, in their seminal definitions of the living as a modifying being, *milieu* assumes a new connotation which is important to understand the conceptual function of "environment" in first English evolutionary theorists.[7]

In his 1855's *Principles of Psychology*, written after reading Comte translated by Martineau, Spencer starts recurring to the lemma "environment" extensively. First, he states that the "progress of correspondence between an organism and its environment"[8] is a fundamental variable in the study of the evolution of life, of which it is no coincidence that in this very volume he provides an original definition: the "progress of life consists in a continuous adaptation between organic processes and those of the environment"[9]. This is a theoretical acquisi-

[6] Comte 1838, pp. 290-292.
[7] Canguilhem 1952; Barsanti 1979.
[8] Spencer 1855, p. 294.
[9] Spencer 1855, p. 293.

tion that not only Spencer would then cultivate throughout his long intellectual career, but that runs through the different phases of his intellectual production, significantly orienting its content. Thus, in 1876, in his monumental *Principles of Sociology*, he not only reiterates the idea that the "organic and inorganic" environments determine "the industrial organisation of a society", thus the degree of evolution and internal normativity of its economic and social relations, but he adds that the relationship between "different neighbouring societies" constitutes a "super-organic environment" that determines the "organisation of the government of each of them".[10] Finally, in *Man Versus the State* (1884), "the environment" is what the "structures of society" act upon, in the form of "both a co-operation and an antagonism" that Spencer sees unfolding in a manner similar to how the "internal organs" of living things operate in their evolutionary development.[11]

With "environment" Spencer gains an insight into social phenomena, as he does not look for their cause in individuals alone; then, he is able to name a dynamic factor which is part and parcel of the general law of evolution. For Spencer, it is not only the physical environment, i.e., the climate, the conformation of a territory and the availability of resources that are crucial objects of study for sociology. What he puts at the core of the evolution of societies are the adaptive capacities of social institutions, which can be examined in light of how they behave in their environment. This is a crucial turning point in the history of "environment": with Spencer, you can evaluate the adaptive capacities of social relations and entities only *ex-post facto*. In this way, "environment" becomes a crucial concept to understand evolution as the natural-historical foundation of competition and capitalist relations of power and domination.[12]

In the same years, Charles Darwin – both in the *Origin of Species* (1859) and then in *The Descent of Man* (1876) – exposes his theory of evolution without referring to "environment". For Darwin, the environment does not push the species to change, as it did for Lamarck, Comte and Spencer, but rewards the more gifted individual and pun-

[10] Spencer 1876, p. 12.
[11] Spencer 1981, p. 448.
[12] Burrow 1966; Pearce 2010; Rudan 2024.

ishes the less fit. In other words, in Darwinian view the environment does not "initiate" the process of organic transformation, but rather "concludes" it by sanctioning the superiority of the species which is able to provide a greater number of superior performances within it. The environment thus provides also to Darwin the possibility to look at the evolutionary process from the standpoint of its provisional conclusion, as a "feedback" mechanism. In Germany, on the other hand, prominent naturalist Ernst Haeckel, who in 1866 introduces the term "ecology", in his *Generelle Morphologie der Organismen,* a text widely commented by Marx and Engels in various letters, insists that variations in the species must be traced back to the combined action of adaptation and hereditary transmission, the former being the agent of "modification", the latter the one of "conservation" of the species.[13]

The sketch here provided shows that without a conception of action and reactions between different entities in a common environment, an alternative view to the mechanistic definition of those relationships in terms of strict causality, no evolutionary understanding of nature would have been possible in the 19th century. To refer to the environment not only as certain specific meteorological agents, as a static *climate*, but as the material condition of existence of the living, and above all not only as physical dimensions, but as a more complex and stratified reality of interactive relations with the living, is the turning point that allows the affirmation of evolutionary thinking. At the same time, evolutionary theories fill the concept with original and contended contents which open up the theoretical space for its translation in social and political discourses.

However variously defined, in each case the evolutionary concept of environment begins to radically challenge the traditional understanding of nature, to mediate the relationship between human history and the history of nature.[14] Hence, this problem is also at the heart of Engels' interpretation of evolutionism and the political role that its scientific vocabulary begins to play from the mid-19th century onward.

[13] Haeckel 1866, p. 195.
[14] Lepenies 1991.

3. *Labour as the Missing Link*

In 1893, in a letter to George Lamplugh, Engels writes: "in the end, nature and history are what make us live and be who we are".[15] This confirms Engels' enduring interest to find a way to conceptualise nature and history, the history of men and the history of nature, as the two fundamental dimensions in which humans are inevitably immersed, thus also defining their possibilities to act and radically change their social condition. For Engels, evolutionism is the theory that allows for a redefinition of that relation. Crucial, for him, is not to deny that nature plays a role in the history of human beings, but to prevent nature from being fixed in laws which, in a flat and a-historical way, would forever determine the political structure of society.[16] This is how Engels continues his argument in the notes on Biology already quoted at the beginning of this contribution:

> Let us accept for a moment the phrase "struggle for existence", for argument's sake. The most that the animal can achieve is to collect; man produces, he prepares the means of subsistence. […] This makes impossible any unqualified transferrence of the laws of life in animal societies to human society. Production soon brings it about that the so-called struggle for existence no longer turns on pure means of existence, but on means of enjoyment and development, which are socially produced. […] Hence the so-called struggle for existence assumes the form: to protect the products and productive forces produced by bourgeois capitalist society against the destructive, ravaging effect of this capitalist social order.[17]

As the ability of men to change their natural environment is incomparable to that of animals and plants, because the formers can make plans about it, so production makes humans' social environments incomparable to those of animals and plants. "Labour", Engels is sure, "created man himself", as it made its evolution from apes possible. What is to be noted is that by taking into consideration the evolutionary distinction between men and plants or animals, Engels turns the political conclusion of that argument upside down: the ability to

[15] Engels 2010b, p. 133.
[16] Vidoni 1985; Liedman 2023; Rudan 2025.
[17] Engels 2010a, p. 573.

change or to adapt to a given environment is not the characteristic of a historical process that legitimises the present, but the indicator of a possible radical change in the structure of social production. Already in *German Ideology*, written by Marx and Engels in 1846, production is what makes men what they are: what they produce, and the way they produce it, determines their "mode of life".[18] This is the expression that Marx and Engels choose to signal the historical determination of the relationship that always exists between humans, between themselves and the nature around them, and between the organisation of production and the sphere of social reproduction. The latter is not reducible to mere physical existence insofar as production and reproduction are from the outset caught up in a historical and social dynamic that shapes life. In the following pages of *German Ideology*, this assumption becomes a fundamental presupposition of the possibility to overthrow the ideology that conceals the relations of production and reproduction of society itself. Then, in *Capital*, Book 1, Marx would state that through labour man "opposes to Nature as one of her own forces […] By thus acting on the external world and changing it, he at the same time changes his own nature", as humans develop faculties they can then learn to master.[19] Marx-Engelsian's criticism offers a potential avenue for historicising the definition of nature as a given, human environment. In other words, their critique allows to unveil how attempts have historically been made to bring order to conflictual social relations by de-historicising them and reducing them to expressions of potential disorder, or lack of "adaptation" to the "social environment".

Labour is the missing link between men and nature, it allows to see production not as a general activity, but as a historical and social one; it allows to see exchanges and relations between men and nature in political terms, avoiding that work of naturalisation of capitalist society done by Malthusianism and Darwinism. The introduction of the lemma "environment" in evolutionary sciences brings about a change in the conceptual constellation through which the relationship between entities can be theorised, and historicised. With his *Dialectics of Nature*, Engels enters systematically in this 19th century's semantic laboratory on "environment", so to criticise the idea that evolution is a natural movement without history.

[18] Marx & Engels 2010, p. 31; Basso 2001; Ricciardi 2019.
[19] Marx 2010, p. 187; Ball 1979.

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Theory of Second Nature: from Hegel to Marx (and Back Again)

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Abstract

The concept of *second nature* (German: *zweite Natur*) occupies a significant role in Hegel's philosophy. It serves to articulate how human beings transcend their given biological 'first nature' through socialisation, habit, institutions and the mediation of spirit while at the same time embodying this transformation in an internalized form – that is, a nature formed by spirit. To this purpose, Marx's critique to Hegel's philosophy has appeared as targeting the dimension of conscience operating unreflectively in the domain of second nature. This reading captures only part of Marx's intentions. Accordingly, the objective of this paper is: (1) to elucidate Hegel's theory of second nature in its systematic and practical dimensions in order to reveal an internal contradiction; (2) to suggest that Marx's interest in Hegel's view on second nature, particularly with regard to the materialist critique of society, labor and the social forms was aimed to *overcome* (not simply to put aside) the dichotomy between 'first' and 'second' nature as well as to see both notions as interconnected wholes.

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1. *Hegel's Notion of Second Nature*

In Hegel's philosophical system, human beings are not simply natural organisms isolated from culture, but beings whose rationality, self-consciousness and sociality transform their given first nature. Second nature refers to those habitual dispositions, social customs, ethical institutions and mediated forms of life that have been *internalised* by the conscience and become for the subject, in effect, a nature – though one produced by spirit rather than one simply given. This is also what Hegel calls a 'habit'. As he writes in §410 of the *Anthropology* section of the *Encyclopaedia*:

> Habit [*Die Gewohnheit*] has rightly been called a second nature (Hegel 2012b, §410, p. 93)

In this passage, habit is portrayed as "immediate being of the soul" (Hegel 2012b, §410) (i.e., something that in appearance is natural) but 'second' because it is shaped by the soul itself (i.e., by Spirit).

However, it is through the mediating function of habit that the subject enacts a reflexive differentiation from the manifold of its sensory determinations, thereby positing itself as an absolute unity – the 'I' – while simultaneously preserving those determinations as the constitutive content of sensuous consciousness. In designating habit as a second nature, Hegel emphasizes that the spirit, in its incipient or subjective phase, retains within itself a determinate *moment* of natural immediacy. This persistence of the natural, constitutes both a limitation upon the autonomy of spirit – marking its residual dependence on corporeality – as well as an essential precondition for the actuality of perceptual consciousness.

The necessity to detect a mediating moment of the second nature within the subjectivity of the spirit (habitus, character, will) finds a parallel in the necessity to identify an *objective* dimension of the *spirit* in institutions, social customs, and the ethical life – the *Sittlichkeit*. In the *Philosophy of Right*, Hegel describes ethical life as a *second nature* insofar as the ethical will become homologous with the law and institutions rather than to a purely spontaneous individual will. Here both the habit and the second nature reappear. As Hegel puts this point:

> But if it is simply identical with the actuality of individuals, the ethical [*das Sittliche*], as their general mode of behavior, appears as *custom* [*Sitte]*; and the *habit* of the ethical appears as a *second nature* which takes the place of the original and purely natural will (Hegel 2012a, §151, p. 195, emphasis in the original).

However, Hegel expresses again here the ambiguity of habits. In so far as ethical habits are scrutinized social expectations where the state entraps unreflectively its own citizens:

> Habit blinds us to the basis of our entire existence. It does not occur to someone who walks the streets in safety at night that this might be otherwise, for this habit of [living in] safety has become second nature, and we scarcely stop to think that it is solely the effect of particular institutions (Hegel 2012a, §268 *Addition*, p. 289).

Habit and institutions are part of self-formation (*Bildung*) of individuals. A person whose second nature is formed in good institutions and ethical customs is freer because her will is not fighting against sheer nature or brute impulses but is embedded in a rational ethical life. However, this same person is also unfree: if habit remains unexamined and conformist, second nature turns into automatisms.

S*econd nature* can be regarded as truly rational, and thus as meeting the criteria of rational adequacy, only insofar as it has overcome its internal contradictions and self-negating tendencies. It follows that what is *in fact* mine is actively appropriated only to the extent that it is subjected to a specific critique – precisely in the process in which "knowing is directed against the representational thought which has come about through this immediacy" (Hegel 2018, §30, p. 19). Consequently, I cannot *take possession* of my second nature – nor *transform it into the form of being-for-itself* (Hegel 2018, §29) – without simultaneously *defetishizing* its appearance as first nature and critically transcending it.

Let's explore this problem.

2. *On the Inherent Contradiction of Second Nature*

As recalled, for Hegel, second nature touches upon freedom, normativity and social practice. Second nature is the *socialised* nature of subjects: institutions become habit, habit becomes nature, nature be-

comes social. At the same time, however, the concept preserves the tension between freedom and necessity: second nature is a site of potential autonomy and also one of unreflective automatism. Hegel's second nature is neither a purely deterministic notion like the causal laws of nature, nor a concept of pure freedom as the will of the Spirit in an unmediated form. Second nature as habit occupies a middle ground, something which allows freedom to become habitual and yet – in its habitual character – also susceptible to automatism. In this respect second nature is characterized by an *undecidable ambiguity*. As observed by Menke (2013, p. 31): "Spirit can only realise itself, in creating (1) a second nature as an order of freedom, by losing itself, in creating (2) a second nature – an order of externality, ruled by the unconscious automatisms of habit."

Second nature is the place where the natural encounters the spiritual: the subject has a nature shaped by spirit but still carries the mark of nature. Second nature functions both positively (as the successful incorporation of freedom into life) and negatively (as the possibility of alienated habit). Accordingly, there cannot be simply a linear transformation from first to second nature. Rather, there must be a dialectical shift: the freedom of spirit generates its own world as a second nature (not simply by opposing itself to an external first nature); however, in so far as second nature is determinate, it contradicts the freedom of the absolute spirit. As an entity situated in between the freedom of the spirit positing itself and the necessity of nature in which this is realized, second nature betrays the free rationality of the spirit. While originating from the free rationality of the spirit, habit reproduces unreflectively itself along identitarian replicas of unconscious automatisms. Individuals are unconscious to themselves in so far as their actions are not guided by 'reasons'. Absolute spirit thus realizes its own inversion in positing itself into an objective determinate being which becomes unreflective habit.

Finally, the duplicity of habit as both an instantiation of freedom and of mechanic laws of nature – in the *Science of Logic* is considered by Hegel as a condition in which "the freedom of individuality is still lacking in it, and since this freedom does not appear in it, the mechanical act appears as a merely external one" (Hegel 2010, p. 631)

This constitutes the primary mode in which the spirit relates and manifests itself in nature. However, this manifestation generates a contradiction. Spirit's freedom gets entrenched into natural neces-

sity. While it liberates itself from the causal determinations of nature, spirit produces a world of nature that is at the same time mechanic. As second nature, such world expresses a critical standpoint: it shows not only the inadequacy of itself to the concept, but also it reveals the way in which this came about.

In his early writing on the *Critique of Hegel's Philosophy of Right* [1843-44], Marx sees the domain of second nature as a place for a critique since this shows "the act of its birth".[1] In the process of generation of the nature-like spirit, second nature is the condition of the finite spirit when entering into contradiction with its own concept, the rationality of its same idea. Marx's critique of Hegel's idealism finds here a privileged standpoint of analysis. The free will of the absolute spirit gets naturalized into a mechanical unconscious repetition of habits incompletely instantiating its original vocation to rationality.

3. *Reception and Transformation of Second Nature in Marx*

Karl Marx famously said he stood on Hegel's shoulders but turned his system 'right side up'. In this respect, Marx inherits Hegel's account of human being as a social, historical and mediated being, but emphasizes labour, social relations and material conditions rather than the spirit or institutions. Marx rejects a fixed human essence set apart from history. In the sixth *Theses on Feuerbach* [1845] he says: "The human essence is no abstraction inherent in each single individual. In its reality it is the ensemble of the social relations." (Marx 1969, p. 14). While Marx does not use the expression '*zweite Natur*', he implicitly employs a parallel concept: the socialised world. This domain is produced by human labour and it becomes for humans a second nature.

In the *Economic & Philosophic Manuscripts* of 1844, Marx writes:

> The *human* aspect of nature exists only for *social* man; for only then does nature exist for him as a *bond* with *man* […] and as the life-elementof human reality (Marx 1959, p. 44)

This passage implies that nature becomes human reality when mediated socially. The socio-natural world, produced by men in their activity is part of their being. Furthermore, in *The German Ideology*, Marx and Engels write:

[1] See Menke 2013, p. 41, quoting Marx 1970, pp. 201-336.

> The first historical act is thus the production of the means to satisfy these needs, the production of material life itself (Marx & Engels 1998, p. 47).

Here Marx indicates that what is socially produced becomes apparently naturalised for human beings. In Marx, the transformation from second nature as internalised spirit/institution to second nature as social-material product highlights the shift from idealism to materialism, from subject to object, from institution to commodity. Unlike Hegel, Marx emphasizes the material and socio-economic dimensions of second nature. The result of human labour – machines, technologies, institutions, customs – becomes for human beings a world *that appears as a given nature*. A human-madeworld becomes objective, external, alien: that is, in effect, a second nature. The human species forms a nature of its own production: humans create a second nature through labor, thereby transcending pure nature and yet remaining embedded in nature.

In Marx's analysis, the distinction between first and second nature corresponds to the opposition between the natural form and the value form of commodities. As Marx writes in *The Capital* [1867], "The value of commodities is the very opposite of the coarse materiality of their substance, not an atom of matter enters into its composition" (Marx 2010, p. 57). The objectivity of value is thus purely social. With the advent of commodity production, humanity's natural and social environments become decoupled from one another. The social reality of exchange possesses spatiotemporal and historical dimensions, yet it is a reality solely of the social sphere – of second nature. However, along a series of periodic reproductions and preceding accumulations where the capital may have passed through, this always preserves its original form. If the laws of exchange are maintained, the mode of appropriation might even be completely revolutionized without affecting in any way the property rights corresponding to commodity production.

Marx sees clearly the necessity to formulate a negative-transformative moment accompanying the dialectical relation between nature and spirit. Such negativity is regained, first, at the cognitive level in the self-awareness of the proletariat as an exploited class and, second, at the pragmatic level, in the revolutionary redefinition of the social

relations of production and labor. As capitalism distorts human nature, Marx sees socially produced nature in need of a transformation. However, the political outcome of such decoupling process is next reconnected to nature in a secondary dimension.

When Marx asserts that from the standpoint of market competition all phenomena appear inverted he considers that the fundamental form of competition is precisely that of *exchange*. Because consciousness in capitalist society is necessarily inverted, awareness of this inversion can only manifest itself through critique; Marx's use of the concept of second nature becomes tied to critique of alienation: when the products of labour confront the workers in terms of independent objects, human relations and the human world fossilize into something that seem natural and unchangeable. This is the sense in which second nature becomes ideological and an emblem of capitalist spirit.

Second nature in this respect calls for a mediated return to the natural once that a system of production has been transformed *from within*. The transformation of the external natural world regains an alienated self, that is, results in the re-appropriation of an emancipatory process of self-liberation. In this regard, naturalism and humanism (*vollender Naturalismus/vollender Humanismus*) in Marx rejoin altogether (see also Khurana 2022). As Alfred Schmidt hints at this point in his seminal study of Marx's conception of nature:

> The artificial, humanized, 'second' nature that has been constructed upon the foundation of 'first nature' ultimately reverts to it. The 'transformation' of natural materials by human beings is undone by the destructive forces of extra-human influences exerted by nature itself (Schmidt 2014, p. 74).

Even if transformed, second nature remains always in a fundamental sense a first nature. Marx's development of naturalism is thus neither a reductive materialism that seeks to dissolve the genuine reality of spirit, nor an idealism that identifies reason with the whole of reality. Rather, it is a form of naturalism that is at once a form of humanism, and a humanism that is at one with a form of developed naturalism.

4. *A Hegelian Rejoinder to Marx?*

In the 1820 Preface to the *Elements of the Philosophy of Right*, Hegel famously claims that "what is rational is actual [*wirklich*], and what is actual [*wirklich*] is rational" (Hegel 2012a, p. 20). To rightly interpret this dictum helps at saving Hegel from certain Hegelianism and provide a rejoinder to Marx.

In the *Science of Logic*, 'the real' (*das Reale*) designates that which, marked by the finitude of its qualitative determinations and by the variability of its quantitative limits, is always capable of becoming other than what it presently is. Indeed – this is the force of the well-known triad *being-nothing-becoming* with which the *Logic* opens – the real is necessarily and perpetually engaged in the process of becoming other than itself. Whereas 'existence' (*Dasein*), whose reflective determination is termed 'reality' (*Realität*), is 'being-with-non-being' and it is traversed by an insuperable negativity of being-in-itself and being-other; the idea of effectuality (*Wirklichkeit*) denotes the dynamic, processual unity of inner and outer – whether expressed as substance and accident, necessity and contingency, or cause and effect.

Wirklichkeit, therefore, constitutes the 'becoming-concept' (*werdender Begriff*) of being – being that is already mediated by the negativity proper to essence. The analysis of *Wirklichkeit* in the *Science of Logic* thus traces the movement by which the rational attains the position of subject within the real or within objectivity itself. This final determination expresses nothing less than the immanence of thought within the world: the unity of thought and actuality in the logical sense of *Wirklichkeit*. This, indeed, explains why from paragraphs §5 to §28 of the *Introduction* to the *Elements of the Philosophy of Right* Hegel recapitulates the culminating stages of this dialectical process. The entire domain of objective spirit – that is, of right understood in its broadest sense – bears the imprint of such fundamental determination. The movement proper to this sphere, whose successive phases constitute the various strata of the Idea of Right, functions as the negative counterpart to the movement of subjective spirit.

While subjective spirit attains its own determination – of freedom – through the overcoming of the natural immediacy in which it is first immersed (under the figure of the soul), right begins from the standpoint of freedom and seeks to give it objective existence as a second

nature. This nature is second in essence, insofar as it presupposes the spirit whose concept it renders is objective. It is therefore qualitatively distinct from first nature, since the objective world it establishes is not given but rather it is *produced and to be produced* by spirit itself.

The Idea of freedom is objective, or more precisely, nothing other than the process of becoming-objective. Yet the full manifestation of this idea, at once subjective and objective, presupposes the traversal of all the determinate figures of objective freedom.

To say that freedom expresses itself in the register 'of its other' – that is, in the register of necessity – is to define, in speculative terms, the very essence of objective spirit or of right itself. Law is freedom speaking to itself in the language of necessity. The identity of freedom and necessity is not an accomplished fact that is statically given, but the very stake and outcome of an infinite process of mediation between concept and being. Hegel's *Science of Logic* establishes the fundamental structure of this process, while its concrete manifestations are unfolded by the real sciences, above all by the doctrine of objective spirit.

However, how do we come to reckon the objectification of the spirit in our subsistent world?For Hegel, since the thought of spirit in its making of actuality emerges only at "dusk" (Hegel 2012a, p. 23) – that is, at the moment when one of its concrete configurations exhausts its vitality and passes out of actuality, this thought reaches its fulfillment only by overstepping the bounds of this objectivity, revealing itself in this self-transcendence as philosophy in the strict and proper sense of the term. It is in this respect – I consider – that Hegel maintains himself faithful to the philosophical mission of critique of the subsistent as 'that which it is'. At the same time, he maintains himself faithful to the recognition of the contradiction of the real with itself as with the uncomplete fulfillment of the object with its same concept. However, if for Hegel this task remains limited to philosophical engagement, for Marx it becomes a revolutionary task.

In either case, though, both strategies are in line of continuity with one another.

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Capitalism's Verkehrung Of Nature

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Abstract

In *Philosophy of Spirit* Hegel describes spirit's process of becoming through the death of spirit and nature. This destructive yet constructive form of death brings about a resurrection. With the emergence of capitalism, a different form of death occurs, resulting, instead, in a material form that is reified. Marx describes the pre-capitalist relationship between man and nature as *Stoffwechsel,* or material exchange, wherein both man and nature lose something as they are changed. Capitalism perverts (*Verkehrt*) this structure and, instead, man annihilates nature materially. As a result, nature's nature is denatured. Nature is reduced to an object out of which man extracts value. This exploitation of nature is the locus of man's exploitation of otherness, an act reproduced not only with nature in the destruction of the earth but also in man's destruction of animals and other humans. While spirit tames madness with habit, in capitalism, man tames nature with habit. This practice begins with man's initial treatment of nature as an object for man's profit which, through repetition, becomes second nature. Once nature becomes natural, when we are able to reproduce nature for our own profit, nature loses its nature while, at the same time, transforming human nature.

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Keywords: Hegel, Marx, Nature, Capitalism, Perversion

Hegel's *Philosophy of Nature* ends with the death of an animal. From out of this death, spirit arises: "The death of the animal is the becoming of consciousness."[1] Spirit facilitates its coming into being with and against nature. By passing through nature, negating what it is not, spirit becomes spirit. As Hegel indicates, "Above this death of Nature, from this dead husk, proceeds a more beautiful Nature, *spirit*."[2] Spirit's being removed from its nature is spirit's nature. Through these negations, or *Vernichtungen,* spirit emerges: "[S]pirit has nature as its presupposition, though spirit is the truth of nature, and is thus absolutely first with respect to it." [3] Each time spirit engages in the act of negation, both spirit and nature vanish.[4] In addition to negation, *Vernichtung* also indicates catastrophe and death. And yet, these forms of annihilation are not material but, rather, the death of what spirit is not.

Because spirit brings forth its being through its death, death is its nature. Nature's nature is also its death because nature's death brings truth, in the form of spirit, to the fore. Unlike spirit, nature is finite and unable to work universality into it. In contrast, spirit only achieves its full being by recognizing its limits and passing through them. Propelling itself past the limits of its unknowing, spirit transcends its limits, transforming itself. Were spirit to remain in its subjectivity, it would become diseased and go mad. Like spirit, were nature to attempt to pass beyond its subjectivity, surpassing its natural limits, the result would be disease. But, unlike spirit, this state would result in nature's death.[5] And yet, when nature attempts to sublate its subjectivity with the universal, the resulting death is its coalescing with truth. This truth is spirit.[6] For Hegel, thus, "The goal of Nature is to destroy itself and to break through its husk of immediate, sensuous existence, to consume itself like the phoenix in order to come forth from this externality rejuvenated as spirit."[7] This destructive constructivity that produces novelty is at the core of Hegel's system.

[1] Hegel 1967, p. 164.
[2] Hegel 2004, p. 443.
[3] Hegel 2007a, p. 9.
[4] Hegel 2007a.
[5] Hegel 2004, p. 441.
[6] Hegel 2004, p. 443.
[7] Hegel 2004, p. 444.

Hegel describes spirit's process of becoming as the liberation struggle, or *Befreiungskampf.* This three-stage process consists of, first, *dreaming through* (*durchträumen*), where spirit "still lies in *immediate, undifferentiated* unity with its objectivity."[8] The second stage is madness (*Verrücktheit*). When spirit negates nature, spirit experiences a moment of radical instability. In this state of momentary madness, spirit is between natures and does not know what its nature is. In addition to this form of madness, Hegel also describes madness as a state of stuckness. If spirit is confronted with a particularity it is unable to assimilate into its interior, spirit can become stuck in this state, leading to madness. The third stage of spirit's liberation process is habit, or *Gewohnheit,* through which spirit masters this moment of crisis by categorising and finding a place in its interior for the particularities it is confronted with. Once this practice becomes habit, it becomes second nature.

Spirit still immersed in the slumber of nature is *Naturgeist*, or what Hegel also calls *Seele,* or soul. Spirit originates in this state of undead where it is neither itself nor nature. In this state of what Hegel calls *Seelenhaftigkeit*,[9] spirit works nature, or subjectivity, out of itself. Out of the difference between spirit and nature emerges a suspension between the two. In this initial state of soul, spirit is still asleep, and not yet for itself. Spirit begins, in other words, in the suspension between worlds. Describing this zone, in the *Phenomenology of Spirit*, Hegel writes*:*

> The inequality which takes place in consciousness between the I and the substance which is its object is their difference, the *negative* itself. It can be viewed as the *defect* of the two, but it is their very soul or is what moves them.[10]

This inequality is the motor for spirit's progression. That Hegel refers to this difference as a "defect of the two" illuminates the negativity innate to the process as well as the affirmative nature of the negative.

In the convergence of nature's death with spirit's ascendence, something in spirit falls away in the form of death. In its place, a new iteration of spirit emerges. Through this process of self-annihilation,

[8] Hegel 2007a, p. 87.
[9] Hegel 2007b, p. 72.
[10] Hegel 2018, p. 23.

spirit redoubles itself, but with difference. As Catherine Malabou writes, "[T]he transition from nature to spirit occurs not as a sublation, but as a *reduplication*, a process through which spirit constitutes itself in and as a *second nature*."[11] Spirit, in this redoubling, changes places with, and replaces, nature. And yet, it is the nature of spirit not merely to be nature, but to break with nature and set itself in opposition to it. This replacing of nature with spirit, and spirit's redoubling of spirit into another nature, will be reduplicated as spirit reproduces itself repeatedly, differentiating itself from what it is not. Spirit also doubles in its separation from soul, what Malabou describes as spirit's haunting of itself: "[S]ubjectivity does not reside in its own being, it 'haunts' itself. The soul is possessed by the possession of itself."[12] This doubling is inherent to spirit. And yet, this doubling can go wrong due to the uncanny nature of doubling: experiencing oneself outside oneself can lead to madness if it is unclear which of the doubles is us.

Spirit's falling out of its nature is a crisis that threatens to fragment spirit. Dismemberment, or *Zerrissenheit,* the term Hegel uses for this fragmentation, indicates a shattering into many individual parts. Despite this crisis, spirit, nevertheless, is able to remain intact. Indeed, spirit's dismemberment protects spirit from this fragmentation. Spirit's movement, because it is negation, is, itself, a form of differentiating that results in a fragmentation. It is this further fragmentation of what is already fragmented that frees spirit from its state of internal fragmentation. As Daniel Berthold-Bond writes, "The being of consciousness is never a state of repose, but involves the perpetual dissolution (*Auflösung*) and dismemberment (*Zerrissenheit*) of its self-identity since consciousness is animated by an internal drive to reach out beyond – and hence to uproot – its present reality toward a fuller self-determination."[13] This provides another perspective to the concept of spirit's death as a form of destructive constructivity. Spirit not only propels itself into the void, it constructs itself out of its dismemberment. The void of annihilation is the site where drive is reproduced and spirit is transfigured. It is also the locus where motion originates. Death is the void spirit and nature both vanish into. Thus, the drive is death. And yet, it is a form of death that is

[11] Malabou 2005, p. 26.
[12] Malabou 2005, p. 35.
[13] Berthold-Bond 1995, p. 45.

constructive in its destruction. With spirit, death is ubiquitous: spirit arises out of the death of nature and is resurrected through its own death. Nevertheless, this form of death is not material but, rather, a psychic form of death.

Spirit is nothing but its resistance to spirit. In order to move out of its initial state of being, spirit confronts, resists, and negates itself. This is spirit'sprocess of becoming. By opposing the obstacle of this estrangement – itself as limit – spirit ceaselessly pushes itself beyond its limits, changing its nature. These negations are a form of death through which spirit passes. This self-othering, or *Sichanderswerden*, is crucial. Spirit's liberation occurs through the process of these annihilations, the result of which is the production of its true being. What spirit becomes through this liberation struggle already exists, as Hegel shows, "Spirit is free, but first it is merely implicitly free in itself. It has to bring forth what it is implicitly in itself."[14] This nothingness is not a lack but, rather, a substance that is inexistent until spirit brings it into existence vis-à-vis negation.[15] Spirit's becoming, its continuous transforming of itself through itself, is a revolution. Beginning in nothing, spirit slowly develops itself from out of this nothingness. And yet, spirit does not form itself solely of itself but with nature. As Hegel indicates, "[T]he transition of nature to spirit is not a transition to an out-and-out Other, but is only a coming-to-itself of the spirit that is outside itself in nature."[16]

In *Capital,* Marx introduces the concept of metabolism (*Stoffwechsel*), the process by which man transforms nature for his own use. This process, necessary for human survival, occurs, as Marx shows, in all forms of society.[17] Just as spirit does not create itself out of nothing, but only through its labor with nature, man does not create anything *ex nihilo.* As Marx writes, "[L]abour is the father of material wealth, the earth is its mother."[18] Man does not create anything but, rather, reorganises nature's creations: "All the phenomena of the universe, whether produced by the hand of man or indeed by the universal laws of physics, are not to be conceived of as acts of creation but solely as

[14] Hegel 2007b, p. 71.
[15] Hegel 2010, p. 51.
[16] Hegel 2007a, p. 15.
[17] Marx 1990, p. 133.
[18] Marx 1990, p. 134.

a reordering of matter[19] (*nur die Formen der Stoffe ändern*)."[20] This reordering is a form of displacing, or *Verrückung*. The word *Verrücken,* in addition to "displacing," also indicates madness. Everything man creates, in other words, is generated through a form of madness.

Marx's concept of metabolism coincides with Hegel's concept of spirit formation. As with spirit, the annihilation of both man and nature is inherent to man's relationship with nature and, indeed, to man's survival:

> Labour is, first of all, a process between man and nature, a process by which man, through his own actions, mediates, regulates and controls the metabolism between himself and nature. He confronts the materials of nature as a force of nature. He sets in motion the natural forces which belong to his own body, his arms, legs, head and hands, in order to appropriate the materials of nature in a form adapted to his own needs. Through this movement he acts upon external nature and changes it, and in this way he simultaneously changes his own nature.[21]

As with spirit, in the process of metabolism, something of man and nature vanish in the exchange. Both man and nature lose something in the transformation.

Whereas spirit's form of death is constructive through its destruction, with capitalism, we have a material form that is reified: with capitalism, man annihilates nature materially. This process begins with man's treatment of nature as an object for man's profit, an act that, through repetition, becomes second nature. Once nature becomes natural, when we are able to reproduce nature for our own profit, nature loses its nature. Nature is no longer nature. It vanishes. Though nature doesn't physically vanish, we, nonetheless, no longer see it. Or, rather, we see nature, but we see only the ways we can extract value from it. We no longer see nature for what it is.

When man sees only value in nature, this is a perversion of Marx's original conception of metabolism. It is also a perversion of spirit's system of becoming vis-à-vis nature. Both Hegel's and Marx's conceptions of nature indicate a denaturing of nature. Conceptualising nature through the naming of nature and thus, capturing it in the

[19] Marx 1990, p. 133, n. 13.
[20] Marx 2022, p. 47.
[21] Marx 1990, p. 283.

symbolic, nature already loses its nature, and its strangeness. Capitalism, nonetheless, introduces another form of denaturing nature that, in a sense, un-does nature. With the help of science, capitalism is able to manipulate nature for its own purposes, leading to the belief that nature is an infinite source that can be exploited without regard for the destruction it causes.

Capitalism's introduction of exchange value transforms the process of metabolism. Rather than occurring between man and nature, we have instead what Marx calls "social metabolism," where one man purchases another man's labor power to produce an object through nature. In other words, capitalism's system of exchange appropriates Hegel's system of spirit, perverting, and displacing nature with capitalism. In replacing nature, capitalism becomes second nature. Having replaced nature, capitalism replaces nature's role of subject formation. The displacement (*Verrückung*) of nature with capitalism is a form of madness. The result is capitalism's formation of subjects, which, in turn, becomes second nature. Unlike spirit, a process whereby nature generates spirit, when capitalism replaces nature, capitalism generates itself. But, unlike nature and spirit, it does not vanish in the process.

Marx describes the commodity form as the *Verrückte Form*,[22] the crazy form, locating madness in the process of exchange value at the core of capitalism. Indeed, Marx refers to exchange value in its more radical form, interest-bearing capital or fictitious capital, as the "Mother of all crazy forms"[23] ("*die Mutter aller verrückten Formen*). In spirit's process of becoming, spirit, by negating what it is not, brings what it is to the fore. As Hegel shows, "Just as the living creature generally, everything is already contained, in an ideal manner, in the germ and is brought forth by the germ (*Keim)*itself, not by an alien power (*Fremde Macht*)."[24] In contrast, capitalist *Verkehrung* transforms an object from what it is, to what it is not. The word *Verkehr* suggests the circulation of goods, or exchange, but also to turn, invert, or pervert, which is precisely what this process does. Indeed, early Marx draws a direct connection between the two, writing that, with regard to "the inversion [*Verkehrtheit*], we may well say the madness [*Verrücktheit*]."[25]

[22] Marx 2022, p. 90.
[23] Marx 1987, p. 433.
[24] Hegel 2007a, p. 7.
[25] Marx 1975a, p. 86.

Spirit's passage through its limitations are constructive through their destruction, leading to spirit's emancipation. In contrast, nature is finite, providing limits to human nature in, for instance, night's darkness or freezing weather. Due to capitalism's capacity for inherent reproduction and science's ability to surpass the limits of nature, man believes the destruction capitalism and science bring into the world are, nonetheless, surpassable. The result is material death and destruction. Because the relationship between man's behavior and the resulting destruction of nature have been abstracted and thus, invisibilized, manmade catastrophes now appear natural. Additionally, because the power that determines whether or not to pass through such limits remains unseen, in the hands of the bourgeoisie and the state, the resulting catastrophes are experienced as natural and, therefore, beyond the limit of the individual to determine.

Capitalism's destruction of nature results in a state in which, as Marx writes, "All that is solid melts into air."[26] Such a state ultimately manifests in a world where, as Žižek writes, "it is simply *nature itself* which melts into air."[27] Due to man's alteration of nature, nature's nature changes human nature. Climate change, for example, and its resulting erratic and destructive weather, leads to famine, death, and mass migration, but also to wars for diminishing resources, resulting in further famine, death, and mass migration. These radical changes to both man and nature lead to further cycles of material death.

The human subject formed through capitalism is without its nature, its nature having been replaced by capitalism. While spirit tames madness with habit, in capitalism, man tames nature with habit. In the process, man denatures his nature, the result of which is his new nature, "egoistic man." This new subject appears as natural, and yet, his nature is animal nature. This is due to his having forgotten his animal nature, which is inherent to human nature. Man's knowledge of his animal nature is what makes man not an animal or, rather, a human animal that is not an animal.[28] For Hegel, the animal is distinct from spirit, or the human animal, because the human animal has the ability to discern and differentiate the representations it

[26] Marx 1976, p. 487.
[27] Žižek 2022.
[28] Hegel 1975, p. 80.

comes in contact with. When we fail to differentiate and sublate the representations we are confronted with, when we forgo our capacity to think, we drop back to this lower, animal, state.

Hegel makes a further distinction between the human and animal in regard to need (*Bedürfnisse*). For Hegel, animal need is limited. The animal needs food and water, for example, and these needs cannot be extended. Though human need, like animal needs, also originates in survival, it is expandable through the human will. As Hegel indicates:

> The tendency of the social condition towards an indeterminate multiplication and specification of needs, means, and pleasures – i.e. *luxury* – a tendency which, like the distinction between natural and educated needs, has no limits [*Grenzen*], involves an equally infinite increase in dependence and want.[29]

Because need is bound to human survival, we continue to strive after objects that are presented to us as if they are aspects of human need even when these objects are unnecessary. In contrast to need, desire is spirit's drive to sublate its otherness. As Hegel shows:

> Where something identical with itself bears within itself a contradiction and is filled with the feeling of its implicit identity with itself as well as with the opposite feeling of its inner contradiction, then there necessarily emerges the urge to sublate this contradiction.[30]

Desire is what drives spirit to transcend "the self-centredness of merely destructive desire (Hegel 2007a, p. 157)." It is spirit's drive to metabolize contradiction, liberating itself from what it is not. "Self-consciousness is *desire*, full stop,"[31] as Hegel writes in the *Phenomenology of Spirit.* In other words, spirit's desire is for desire itself.

With the emergence of capitalism, man's desire is perverted by becoming bound to objects. As a result, man is reduced to "the animal reality bound to individuality."[32] This shift transforms society from one in which subjects are dependent upon one another to one in which each is focused on fulfilling their individual desires. Human

[29] Hegel 1991, p. 231.
[30] Hegel 2007a, p. 154.
[31] Hegel 2018, p. 103.
[32] Hegel 2007a, p. 15.

nature is replaced with the worship of money and commodities. This new form of greed provides a means of placing oneself in the world through the acquisition of objects, changing one's relation to others, the world, and oneself. Because one has something by which to stabilise oneself, one is protected from the disorientation of madness. And yet, this form of orienting oneself through the acquisition of money and objects is, itself, a form of madness.

In *Grundrisse,* Marx describes greed as "a particular form of the *drive*, i.e., as distinct from the craving for a particular kind of wealth, e.g. for clothes, weapons, jewels, etc."[33] Though there were instances of greed during, for example, antiquity, what Marx calls "driven greed," these were exceptions. With capitalism, such exceptions become the norm.[34] As Marx writes, "Money is the estranged essence of man's work and man's existence, and this alien essence dominates him, and he worships it."[35] For both Marx and Freud, drives are not givens but mediated by the social, resulting in the altering of structural, as well as phenomenal, dimensions. As Adrian Johnston shows, capitalism alters the libidinal configuration of subjects from pre-capitalism's "more constrained and implicit (in itself [*an sich*]) to becoming more unbound and explicit (for itself [*für sich*])."[36] This new form of greed renders the drive an object, and the (drive) object, then, alters the subject.

Capitalism's incessant pursuit of profit and its resulting need for more land and resources necessitate the annihilation of entire populations along with the theft of their land, homes, and belongings. Because primitive accumulation is the original form of capitalism, each time it occurs at a new site, it restarts the process of capitalism all over again. These displacements are a form of *Verrücking.* Furthermore, because capitalism necessitates its constant reproduction, it is incapable of slowing down or stopping, regardless of the destruction such reproduction creates. "The more developed the capital," as Marx writes in the *Grundrisse*,"the more extensive the market over which it circulates, which forms the spatial orbit of its circulation, the more does it strive simultaneously for an even greater extension of the market and for greater annihilation of space by time."[37]

[33] Marx 1993, p. 222.
[34] Johnston 2017, p. 321.
[35] Marx 1975b, p. 172.
[36] Johnston 2017, p. 272.
[37] Marx 1993, p. 539.

Moreover, capitalism's emergence coincides with a change in maps, as David Harvey shows, from a sensual depiction of land with hills, plants, and homes during feudal times to the flattening of land in contemporary depictions. This shift, by reducing the earth to abstractions, serves as a tool for breaking up and dividing the land. No longer Earth with its diverse forms of nature and animals, Earth is reduced to nothing but an abstract object to be sold. This radical shift transforms the way we comprehend space. Indeed, as Harvey shows, categories of time and space are fluid, constantly changing alongside capitalism.[38]

And yet, it is not only space and time that have changed. As Peter Sloterdijk points out, even the atmosphere has changed.[39] This change in atmosphere and space, what Sloterdijk describes as an alteration of the globe, with a shift, for example, of the horizon line, also alters lived space. Space and time are intrinsic to the world, as Kant shows. The horizon line is what orients us:

> In the proper meaning of the word, to *orient* oneself means to use a given direction (when we divide the horizon into four of them) in order to find the others – literally, to find the *sunrise.* Now if I see the sun in the sky and know it is now midday, then I know how to find south, west, north, and east.[40]

When time and space are altered, we lose our ability to determine reality from illusion or, *Wahn*, madness. Without the ability to orient ourselves, we are oriented or, rather, dis-oriented, by capitalism. Because capitalism's form of orientation is repeated, this form of disorientation becomes habit.

Habit can be understood as a form of plasticity with madness as its substance. Because habit provides stability, habit is necessary for both a subject's interior cohesion and also for social cohesion. With habit, feeling becomes second nature, allowing one to engage in the world, and not get stuck on a particularity: "The essential determination is the *liberation* from sensations that man gains through habit, when he is affected by them."[41] Habit, thus, is a form of reproduction through which one reproduces more and more levels of freedom.

[38] Harvey 1989, p. 254.
[39] Sloterdijk 2013.
[40] Kant 2001, p. 8.
[41] Hegel 2007a, p. 131.

In capitalism, capitalism becomes habit, short-circuiting spirit's process through momentary madness, the necessary stage for subjective formation. With capitalism, we have a new form of habit, capitalist habit. The very mechanism that ought to provide a remedy for madness becomes, itself, a form of madness. If habit is the practice of repeating an act that becomes nothing over time, then capitalist habit is habit that, sublimated into capitalism, makes, through the act of repetition, everything the same. As a result, difference vanishes. Capitalist habit makes natural that which is not. We become accustomed to the shocks and crises inherent to capitalism, while, at the same time, forgetting the cause of our forgetting, capitalism.

With capitalist habit and capitalism's reification of death, not only does material death become ubiquitous. But, like capitalist habit, death gains a quality of plasticity with the ability to supersede the plasticity of habit. As with madness and habit, there are constructive and destructive forms of plasticity. What Malabou calls destructive plasticity, unlike spirit's plasticity's constant transformation, "does not repair."[42] Rather, destructive plasticity destroys dialecticity, rendering subjects stuck without the possibility of change. Unlike spirit's active forming of itself, this new form of human does not determine itself, does not differentiate, and also does not know that it is not doing these things. Without habit, habit having been transformed by capitalist madness into capitalist habit, the human subject remains stuck in this suspension in a state of undead.

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[42] Malabou 2012, p. 6.

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Reconsidering the Marxist critique of Hegel's concept of nature

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Abstract

In this paper, I argue that certain aspects of the classic Marxist critique of Hegel's conception of nature should be reconsidered in light of Hegel's *Anthropology*. According to this Marxist critique, one of the most important expressions of the difference between Marx and Hegel lies in their divergent conceptions of nature. Hegel sees nature as ultimately subordinate to spirit, while also denies the possibility of any meaningful natural history. By contrast, Marx has an integrated vision of natural and human history as inherently interconnected. I show how this position, exemplified by Marx's arguments in the *Economic and Philosophical Manuscripts* and reproduced by later commentators, ascribes to Hegel a view of the distinction between nature and spirit in which the latter is directly identified with human consciousness. I then point to features of Hegel's transition between nature and spirit which partially undermine this view and argue that Hegel's true position involves a more complex understanding of the relation between nature and spirit. In particular, I argue for the importance of considering the *Anthropology* to do justice to Hegel's position.

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Keywords: Hegel, Marx, philosophy of nature, anthropology, natural history

1. *Introduction*

In this paper, I examine the classic Marxist materialist critique of Hegel's conception of nature. Specifically, I consider that aspect of the critique which is based on Hegel's rejection of the philosophical relevance of natural history. I argue that this critique is based on an overly simplistic view of Hegel's system and point to features of Hegel's thought which run against the critique, or at the very least complicate the image of Hegel which forms its basis.

In the first section, I set out the Marxist line of attack against Hegel's conception of nature, as put forward by Marx himself, and a range of his interpreters. On my reading, this line of attack is based on the idea that Hegel overemphasises the distinctiveness of spirit in relation to nature – only spirit is truly historical, and capable of producing genuine novelty. As a result of this focus, Hegel is unable to account for the fact that human history is also part of natural history, and that humanity's emergence out of nature is ultimately a part of nature itself.

In the second section, I argue that the Marxist critique is based on an overly simplistic conception of Hegel's systematic philosophy and sketch out some of its features which suggest the need for a more nuanced consideration. Specifically, I suggest that a reading of Hegel in which nature and spirit are understood in terms of a simple opposition between externality and self-consciousness is inadequate. For example, Hegel's *Anthropology* – to my knowledge rarely discussed in the Marxist literature on this issue – suggests that a much more complex understanding of the relation between nature and spirit is required to do justice to Hegel.

2. *The Marxist critique of Hegel's philosophy of nature*

In my interpretation, the main charge of the classic Marxist critique of Hegel's philosophy of nature is that Hegel's idealism fails to account for material, mind-independent reality, and thus overvalues human agency relative to nature. The elements of this critique in Marx can be found in the posthumously published *Economic and Philosophical Manuscripts*.

Specifically, the third manuscript concludes with a general critique of Hegel's philosophy, perhaps most famous for its discussion of alienation. A basic point underlying this critique is that Hegel's philosophy

privileges abstraction, beginning with abstract logic and terminating in absolute philosophical (abstract) knowing. As a result, while Hegel grasps the truth of how labour is man's "act of self-creation", he can do so only in inverted form, as abstraction.[1] Hegel's abstract approach also has implications for his understanding of nature.

In the final pages of the Manuscripts, Marx discusses Hegel's conception of nature in more detail. Once again, its shortcoming is that it is mere "abstract nature" which "only repeats to him in a sensuous, external form the abstractions of logic."[2] By contrast, "nature as nature", that is, taken by itself, is simply nothing, or "only has the sense of an externality to be superseded."[3] On this account, nature's only function and ultimate fate is to be superseded by spirit.

Against this Hegelian understanding of nature, Marx argues for a form of "naturalism" which recognises that human beings are both fully part of the natural order, and also specific human beings within that natural order, which he calls species-being (*Gattungswesen*).[4] Only such a position, he argues, can provide an adequate understanding of history and the place of humans within it. The idea that "history is the true natural history of man" forms the basis for the insight that the distinctive feature of humanity, its history, is linked to its characteristic feature as a natural being, as species-being.[5] Thus, Marx formulates the demand that human history should be understood as a distinct part of natural history.

Academic commentary on Marx and Hegel's conceptions of nature has largely followed Marx's own portrayal of his break with Hegel on the question of nature and natural history. In *Der Begriff der Natur in der Lehre von Marx*, Alfred Schmidt shows how Marx's views on nature are based on a radicalisation of Feuerbach's critique of Hegel. Marx follows Feuerbach in exhorting the "priority of nature" but refuses to absolutize a metaphysical conception of nature.[6] Instead, Marx insists that, just as nature cannot be understood separately from the human, humanity is not outside of nature, so that thought itself is a product of natural history. Schmidt points out that this involves an inversion of

[1] Marx 1975, p. 395.
[2] Marx 1975, p. 399.
[3] Marx 1975, p. 399.
[4] Marx 1975, p. 389.
[5] Marx 1975, pp. 389-391.
[6] Schmidt 1993, pp. 18-19.

our standard understanding of natural history as pre- or non-human – our own history remains natural history as long as we allow ourselves to remain governed by economic and social forces as forces of nature.[7]

Schmidt goes on to point out that Marx's understanding of natural history departs significantly from Hegel's, for whom natural history simply plays no meaningful role. Schmidt cites a passage from the introduction of Hegel's *Naturphilosophie* (*Philosophy of Nature*) rejecting the view that there could be real evolution within nature, for example from lower to higher forms of life.[8] In connection to this point, Schmidt makes the important observation that, for Marx, the evolutionary development of different lifeforms is simply a self-evident fact, as shown by explicit admiration for Darwin which he expresses in his later work.[9]

The characterisation of natural history as a key issue for understanding the divide between Hegel and Marx unites those who otherwise sit in opposed camps on other issues in Marxist scholarship. For John Stanley, in an article sharply critical of Schmidt's rejection of the dialectics of nature, Marx's break from Hegel consists precisely in the reversal of the ontological priority between nature and spirit.[10] Stanley points out that, for Marx, "plurality is the very core of nature itself", so that a basic dialectic of simultaneous objectivity and subjectivity characterises all of natural being, not only humans.[11]

Stanley goes further in characterising what he sees as the full consequences of Hegel's idealist commitment to a view of spirit centring on consciousness. In rejecting natural history, Hegel betrays his discomfort with "nature as such", thus "seeking to escape from it by stamping subjectivity onto it".[12] Here, Hegel's inadequate view of nature is portrayed as a direct consequence of his idealist bias in favour of consciousness and spirit.

John Bellamy Foster and Paul Burkett argue that Marx's use of the conceptual couplet of the organic and inorganic was heavily influenced by Hegel's concept of organic being. At the same time, Foster and Burkett stress the centrality of Marx's rejection of Hegel's overall

[7] Schmidt 1993, p. 37.
[8] Hegel 1970a, pp. 31-32.
[9] Schmidt 1993, p. 38.
[10] Stanley 1997/1998, p. 460.
[11] Stanley 1997/1998, p. 461.
[12] Stanley 1997/1998, p. 468.

conception of nature as arguably his most fundamental point of disagreement with Hegel. The difference between their materialist and idealist dialectics is thus aptly expressed by the contrast between Hegel's "denial of evolution" and the "rigid separation of human beings from the rest of nature" on the one hand, and Marx's goal of explaining how "human history and natural history were interconnected within sensuous existence".[13]

From this brief survey of parts of the relevant literature, a set of basic themes can be discerned regarding the understanding of the relation between Hegel and Marx's respective conceptions of nature: Hegel's concept of nature is the basis for his denigration of natural history, denial of evolution, and unjustified anthropocentrism, and Marx's rejection of it is one of, if not the most crucial differences between the two thinkers.

3. *Nature and spirit in the context of Hegel's system*

In this section, I show that the basic dichotomic model for the relation between nature and spirit which underlies the Marxist critique of Hegel's conception of nature is too simplistic. For Hegel, nature and spirit become determinate as concepts within the entirety of the philosophical system which encompasses them. Nature and spirit are indeed two of the most important axes of Hegel's system, constituting, alongside logic, the basic tripartite structure of the *Encyclopaedia of the Philosophical Sciences*. However, the interpretation of the relationship between these systematic divisions, and the status of the transitions between them, is not a straightforward matter.

The suggestion that Marx's understanding of Hegel is, at least in certain respects, too simplistic, echoes Roberto Finelli's reading of Marx's early critique of Hegel in terms of a generalised inversion. According to Finelli, the young Marx remained clouded by Feuerbach's interpretation of Hegel, resulting in an insufficient grasp of the latter's complexity and enabling only a superficial critique on certain core points.[14] This insight is highly compatible with the central point that I advance in this paper, which is that Marx's understanding of the status of nature for Hegel is not sophisticated enough.

[13] Foster & Burkett 2000, p. 411.
[14] Finelli 2016, p. 251.

I want to focus on the moments of systematic transition within Hegel's system. Undeniably, the transition between nature and spirit is one of the most structurally significant cases of such a transition. My aim here is simply to suggest that the 'global' transition between nature and spirit, must be considered alongside more specific, 'local' transitions such as those between nature and the soul as the first form of spirit, and the soul and consciousness as specific forms of spirit. In doing so, I highlight the importance of the *Anthropology* section of the *Philosophy des Geistes* (*Philosophy of Spirit*).

Paying attention to these further moments of transition introduces complexity to a picture which the Marx of the *Manuscripts* depicts very simply. As we have seen, Marx's interpretation of the systematic status of nature turns on the idea that nature's mediate position between logic and spirit is evidence of its transitoriness, as that whose ultimate purpose is to be there only to be sublated by spirit. On Marx's reading of Hegel, nature's externality stands for its inherent defectiveness, which means that it necessarily supersedes itself because "it is already posited [...] as a potentially *superseded* being".[15]

I will now briefly complicate this picture by pointing towards some further features of this transition. The beginning of the *Philosophy of Nature* states that "nature has yielded itself as the Idea in the form of otherness".[16] For Hegel, what distinguishes the sphere of nature as a whole is the determination of externality. The development of the *Philosophy of Nature* as a whole can be characterised as the process by which this externality sublates itself. This process culminates in the final moment, the death of the individual, at which point nature is no longer determined as externality and thus becomes spirit.[17]

There is no obvious or straightforward interpretation concerning the status of death as both the culmination of the conceptual development of nature and the emergence of spirit. However, the *Additions*, based on posthumously compiled lecture notes appended to the text of the *Encyclopedia*, characterise this development as being internal to the concept of nature itself.[18] If spirit emerges as a result of the devel-

[15] Marx 1975, p. 400.
[16] Hegel 1970b, p. 205.
[17] Hegel 1970a, p. 537.
[18] Hegel 1970a, p. 538.

opment immanent to the concept of nature itself, it cannot simply be seen as an absolutely foreign substance from nature in the manner sometimes suggested by the Marxist critique.

Further complications are introduced by the unfolding of the transition from nature to spirit in the final part of the encyclopaedic system, the *Philosophy of Spirit*. The *Philosophy of Spirit* covers the varied forms of spirit which Hegel further divides into the subjective spirit (roughly equivalent to philosophy of mind), objective spirit (social and political philosophy), and the absolute spirit, which includes art, religion, and, finally, philosophy itself. For the purposes of this paper, the most relevant aspect of spirit is the first form of subjective spirit, the soul, which is developed in the first section, titled *Anthropology*.

At the outset of the *Anthropology*, Hegel returns to the transition of nature to spirit. He reiterates the idea that "spirit's coming into being means therefore that nature of its own accord sublates itself as being inadequate to truth."[19] Hegel goes on to emphasise that the initial result of this transition is not yet fully spirit, but rather soul, which he defines as "the universal immateriality of nature, the simple ideal nature of the life of nature".[20] Hegel uses the term "Naturgeist" (natural spirit) to point to this continuity between nature and spirit – as soul, spirit is not yet fully differentiated from nature.[21]

In fact, the different forms of the soul, distinguished as the natural, the feeling, and the actual soul, are characterised by their progressive degrees of individuation within, and differentiation from nature. The *Additions* to the *Anthropology*, which are by far the most extensive of the entire *Encyclopaedia*, cover a wide range of material, from geographic and racial differences between peoples, the individual senses, psychic disorders, to habits and body-language.

Despite the *Anthropology*'s title, the issue of a specifically human form of soul only starts to be consistently thematised in its final parts. For example, Hegel sees habit as the means by which human beings are liberated from their dependence on their natural existence, since habituation enables the modulation and ultimately the control of bod-

[19] Hegel 1978, p. 3.
[20] Hegel 1978, p. 3.
[21] Hegel 1970c, p. 40.

ily responses to external sensations.[22] The human figure, characterised by its upright stature, is the culmination of soul, and also marks the point of transition to the next form of spirit, consciousness.[23]

A central feature of this entire progression, worth highlighting in the context of my discussion of the Marxist critique, is the ambiguous status of soul as a bridge between the systematic spheres of nature and spirit. The characterisation of soul as natural spirit outlines this in-between status of the category: it is no longer fully nature, but also not yet properly spirit, while at the same time mediating between the two spheres.

This ambiguous systematic status of the soul points to the complexity which characterises the relation between nature and spirit within Hegel's system. This complexity is not captured by Marx's discussion of this relation in the *Manuscripts*, in which neither the specific character of the transition from nature to spirit in the moment of death nor the systematic status of soul are considered. The subsequent literature on the issue seems to perpetuate the consequences of this omission through its strong identification of spirit with consciousness and anthropocentrism. But as my brief sketch of the *Anthropology* shows, the human figure only begins to play a significant role later in the section, while consciousness is not a part of the *Anthropology* at all.

Marx may yet be right in saying that the Hegelian category of nature necessarily surpasses itself. Consciousness is clearly a central characteristic of spirit, and there are undoubtedly anthropocentric aspects of Hegel's thought. I have tried to argue that paying attention to the specific character of the systematic transition from nature to spirit, and especially to the role played by the *Anthropology*, requires placing an asterisk after these received characterisations of Hegel's thought. Until we consider the nature of the qualification introduced by this asterisk, our evaluation of Marx's reading of Hegel may suffer from some kay deficiencies.

4. *Conclusion*

The central point that I have developed in this paper is that a common version of the Marxist critique of Hegel is based on an overly simplistic understanding of Hegel's concept of nature. I have tried to

[22] Hegel 1970c, p. 184.
[23] Hegel 1970c, p. 192.

point towards the roots of this misunderstanding in Marx's early critique of Hegel and shown how it has been taken up in the subsequent academic literature. Further, I have pointed to specific features of the systematic transition from nature to spirit which point to the need for a more complex understanding of Hegel's systematic concepts.

In advancing this argument, I aim to identify textual features and themes which could potentially help to further stimulate the existing philosophical discourse on Marx and Hegel in relation to the issue of nature. In this regard, I have been most forceful in arguing for the significance of the *Anthropology*.

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Labour as Mediation: Reconstructing Nature in the Young Marx

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Abstract

This article examines the relation between labour, nature, and emancipation in Marx's *Economic and Philosophic Manuscripts of 1844* by situating them in a comparative frame with Feuerbach's early 1840s writings. While Feuerbach conceives nature as an immediate, pre-social ground of human essence, Marx redefines nature as a historically mediated relation constituted through labour. Through close textual analysis, the article reconstructs Marx's emerging materialist conception of nature and identifies the *Manuscripts* as introducing a key theoretical innovation: labour as the metabolic nexus through which the human-nature relation is produced, estranged, and rendered transformable. Estranged labour appears as the mechanism that disrupts this metabolism, while emancipated labour becomes the condition for its restoration. The conclusion critically engages leading interpretations – Foster and Burkett's ecosocialism, Clark and Collier's naturalism, the Althusserian rupture thesis, and Butler's anthropological account – to argue that, although elements of this view are present across these readings, Marx offers a more explicit claim: ecological emancipation requires the historical reorganisation of the social relations that mediate humanity's metabolism with nature.

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Keywords: Marx, nature, labour, estrangement, metabolism

1. *Introduction*

In the manuscript of *The German Ideology*, one reads: "In so far as Feuerbach is a materialist, history does not register with him, & in so far as he brings history into consideration, he is no materialist. With him materialism & history diverge completely."[1] This well-known passage offers a useful point of departure for showing that the very specificity of historical materialism entails, from its foundations, an intense engagement with the configuration of nature as such – an engagement that turns the status of "nature" into a decisive theoretical problem rather than a neutral background.

The most recent wave of ecosocialist research – above all the works of Paul Burkett, John Bellamy Foster, and, more recently, Kohei Saito – has decisively reconfigured the analytical framework and theoretical import of Marx's reflections on nature over the past three decades.[2] The renewed interest in Marx's ecosocialism has, in turn, revived attention to the material premises underlying his theory of value and, more broadly, to the potential theoretical uses of his mature *Critique of Political Economy*. In this respect, the notion of "metabolic exchange with nature [*Stoffwechsel mit der Natur*]"[3] is now widely regarded as the most conceptually generative category by contemporary interpreters of Marxian ecosocialism.[4] Yet this focus on the so-called "metabolic rift" has often displaced a deeper question: how did Marx first arrive at a conception of nature that could be mediated, ruptured, and socially reorganised?

[1] Marx & Engels 2014, pp. 59-60.
[2] Burkett 1999; Foster 2000; Saito 2017.
[3] Marx 1973, p. 488.
[4] See Burkett 1999, pp. 25-47; Foster 2000, pp. 141-177; Foster & Burkett 2016, pp. 70-78; Saito 2017, pp. 63-137.

The *Economic and Philosophical Manuscripts of 1844* (hereafter *Manuscripts*) have received a more ambiguous reception within recent critical literature. On the one hand, the thesis of nature as "man's inorganic body" has prompted some of the earliest critical contributions to Marx's "ecosocialism" and continues to attract significant interest.[5] On the other hand, the interpretative framework surrounding these notebooks continues to be overshadowed by Louis Althusser's judgment: that they are at once "brilliant" yet intrinsically marked by a philosophical theory of "alienation", viewed as a residual and ultimately superseded mode of philosophizing from which the young Marx was already beginning to depart.[6] This tension – between ecological potential and humanist embarrassment – has left the *Manuscripts* theoretically underdetermined in much of the secondary literature.

A further line of interpretation – most prominently in the work of Axel Honneth and Rahel Jaeggi – deploys the categories of "reification" and "alienation" as diagnostic tools for contemporary "social pathologies." Yet this move tends to push these concepts beyond the methodological framework within which Marx first formulated them in the *Manuscripts*. In doing so, it relocates "reification" and "alienation" into a conceptual horizon severed from their original Marxian grounding.[7] The consequence is that the *Manuscripts* risk appearing either as philosophically immature or as endlessly adaptable – precisely the opposite of their actual theoretical specificity.

Our aim here is to illuminate certain aspects of the triangulation between labour, nature, and emancipation in the *Manuscripts*. The argument unfolds in two main movements. First, it offers a comparative analysis of the concept of nature as it emerges in Marx's *Manuscripts*, read alongside key passages from Ludwig Feuerbach's writings of the 1840s – above all the *Theses for the Reform of Philosophy* and the *Principles of the Philosophy of the Future*. Second, it examines how these divergent conceptions of nature shape the respective understandings of "species-being" (*Gattungswesen*) in the two thinkers. While Feuerbach's notion of "species-being" remains predominantly naturalistic,

[5] See Marx 1988, pp. 75-76. CfR. – to mention only the principal contributions to the debate – Clark 1989; Collier 1991; Foster & Burkett 2000; Clark 2001 and Butler 2019.

[6] Althusser 2005, p. 158.

[7] Honneth 2008; Jaeggi 2016. For a discussion of Honneth's 2008 account in relation to Lukács 1971, see Gargani 2018.

Marx's account – already in the *Manuscripts* – is defined by a constitutive historical and economic mediation. By foregrounding this shift, the article argues that the *Manuscripts* do not simply anticipate Marx's later critique of political economy: they already recast the nature-humanity relation as a site of material, historical contradiction. It is precisely this genesis of Marx's notion of "species-being" that determines the distinctive inflection of his conception of emancipation, one that situates the human and the natural within an inseparable horizon.

2. *Nature in Feuerbach's Writings of 1843*

Marx himself, in the *Manuscripts*, attributes to Feuerbach's *Theses for the Reform of Philosophy* and the *Principles of the Philosophy of the Future* the merit of having "in principle overthrown the old dialectic and philosophy."[8] The proximity of this Marx to the Feuerbachian project articulated in the two celebrated essays of 1843 is further underscored by the fact that the first of these appeared in the sole year of publication of Arnold Ruge's *Anekdota*, alongside – albeit anonymously – Marx's own article on censorship.[9] Yet Marx, in a private letter to Ruge dated 13 March 1843, strikes a more cautious note regarding Feuerbach's first essay: "Feuerbach's aphorisms seem to me incorrect only in one respect, that he refers too much to nature and too little to politics. That, however, is the only alliance by which present-day philosophy can become truth".[10]

For the Feuerbach of 1843, "nature" appears, not without ambiguity, as the authentic horizon to which humanity must return in order to free itself from theological and speculative alienation. The prospect of a radical philosophical new beginning grounded in a "return to nature" – more proclaimed than effectively realised at that stage – had,

[8] As Marx observes (1988, p. 143), he further adds: "Feuerbach's great achievement is: the proof that philosophy is nothing else but religion rendered into thoughts and thinkingly expounded, [...] the establishment of true materialism and of real science, since Feuerbach also makes the social relationship 'of man to man' the basic principle of the theory; his opposing to the negation of the negation, which claims to be the absolute positive, the self-supporting positive, positively grounded on itself." (Marx 1988, p. 144).

[9] See Feuerbach 1843 and Marx 1843. For a historical-philosophical contextualisation of the two essays, see Tomasoni 2015, pp. 252-257 and Tomasoni 2015, pp. 272-289 (with extensive bibliography).

[10] Marx 1975, p. 400.

in fact, already been announced in Feuerbach's 1839 essay *Towards a Critique of Hegelian Philosophy*. There, where Feuerbach sketches the contours of his new "genetic-critical philosophy," intended to revise the presuppositions of idealism, one reads: "However, the all-inclusive and all-encompassing reality is nature [...]. The only source of salvation lies in a return to nature."[11]

A few years later, once Feuerbach's break with Hegel had assumed a clearer profile, he states in the *Theses for the Reform of Philosophy*: "All science must be grounded in *nature*. A doctrine remains a *hypothesis* as long as it has not found its *natural basis*. […] *Philosophy must again unite itself with natural science, and natural science with philosophy.*"[12] Nature thus functions as a principle of truth, set against the falsifying abstractions of speculative thought – operating, in effect, as a kind of anti-speculative counter-principle, a "non-philosophy."[13] In its "immediacy," nature marks both the foundation and the positive limit of human essence – a dimension to be reclaimed in order to overcome the idealist-theological distortions that estrange humanity from reality itself.[14]

A similar orientation emerges in the *Principles of the Philosophy of the Future*, where Feuerbach locates naturalistic anthropology as the necessary foundation for the realisation of human essence – an essence that unfolds through a sensuous and corporeal dimension. He writes: "The new philosophy makes *man*, *together with nature* as the basis of man, the *exclusive*, *universal*, and highest object of philosophy; it makes *anthropology*, *together with physiology*, the *universal science*."[15] In Feuerbach's framework, the relation between humanity and nature does not appear as historically or socially mediated, but rather as an unambiguously positive pole to which humanity must return. Yet this appeal to "immediacy" remains confined within an essentially contemplative register, unable to transcend the very limitations it seeks to overcome.

[11] Feuerbach 2012a, p. 94. On the "genetico-critical philosophy", see Feuerbach 2012a, pp. 85-86.

[12] Feuerbach 2012b, p. 172.

[13] See Feuerbach 2012b, p. 164.

[14] On "immediacy," see – among others – Feuerbach 2012b, pp. 157 and 164. For an interpretation that seeks to highlight the positive elements of Feuerbach's account of immediacy, see Löwith 1972. Contra Thies 1972; Arndt 1990; and Arndt 1998.

[15] Feuerbach 2012c, p. 243.

Feuerbach, as he appears in the two essays of 1843, therefore, does not conceive nature as a field of historical or social transformation, but rather as an abstract domain posited as pre-social and pre-historical, within which humanity is called to rediscover its authenticity. Such a view lacks any notion of "praxis" understood as productive activity – one capable of transforming both nature and the social conditions of human existence. For Marx, this absence is decisive: a thinker committed to conceiving emancipation not merely as "political" but as fully "human" could no longer accept Feuerbach's framework as a viable theoretical point of departure.

3. *Nature in the Economic and Philosophical Manuscripts of 1844*

In the *Manuscripts*, nature occupies a central place, serving both as the locus in which estrangement manifests itself and as the field in which its overcoming must be materially grounded. What marks Marx's position is not simply the claim that nature is historically mediated, but the identification of labour as the specific modality of this mediation. Nature appears only within the specific nexus of social relations that organise human productive activity; it is not an external datum, but a category constituted through historically specific forms of praxis. In contrast to Feuerbach's appeal to an immediate and presocial nature, Marx treats nature as intelligible only through the concrete organisation of labour.

Marx writes: "Nature is man's inorganic body – nature, that is, insofar as it is not itself the human body. Man lives on nature – means that nature is his body, with which he must remain in continuous intercourse if he is not to die. That man's physical and spiritual life is linked to nature means simply that nature is linked to itself, for man is a part of nature."[16] This passage does not describe a merely organic continuity between humanity and nature; it articulates a relation that is materially mediated and historically shaped. The metabolic relation Marx evokes is neither biological nor philosophical, but socially material: it names the process through which human beings constitute themselves as natural and social beings in and through determinate forms of labour – forms that, under capitalism, are structurally estranged.

[16] Marx 1988, p. 76.

The *Manuscripts* are the first place in Marx's corpus where labour acquires a definite conceptual function: it becomes the principle through which the human-nature relation is rendered intelligible. In the slightly earlier writings of the *Franco-German Annals*, Marx had foregrounded the proletariat and its historical vocation, yet without analysing the internal structure of productive activity or its latent forms of estrangement.[17] What the *Manuscripts* introduce is therefore not simply a typology of "estranged labour," but a shift in Marx's methodological horizon: estrangement is presented as the distortion of a fundamental metabolic relation between humanity and nature.[18] The familiar fourfold schema of estrangement should thus be read not primarily as a description of the failure of "species-objectification," but as the effect of a rupture in this metabolic process. For the first time, labour appears as a practical-material mediation through which the interchange between the human and the natural becomes possible. Marx offers a response to the problem Feuerbach had posed but confined to a contemplative register. Where Feuerbach called for a "return to nature," Marx identifies in labour the concrete point of access to such a return – not as a regression to immediacy, but as a historically mediated process. Labour constitutes the site where the passage between humanity and nature is actualised; estranged labour is precisely what obstructs this passage, interrupting the material process by which human beings both sustain and transform their relation to nature.

To conceive praxis – labour – as the osmotic site of exchange between the human and the natural is to locate the Archimedean point at which their relation becomes materially operative. Seen in this light, "estranged labour" appears not merely as a social pathology but as a structurally determinate obstruction to the restoration of metabolic unity between humanity and nature – an obstruction that Marx held to be invisible to his predecessors. Feuerbach had indeed called for such a restoration, but lacked the conceptual means to determine the mediations through which it might be historically realised.

[17] See Marx 2000b, p. 82.

[18] Unless otherwise indicated, we render *Entfremdung* as "estrangement" and *Entäußerung* as "externalization," bearing in mind that, as Quante notes, "Marx [in the], in contrast to Hegel, does not terminologically distinguish between *Entfremdung* and *Entäußerung*" (Quante 2009, p. 248).

For the young Marx, Hegel's image of nature as "the Idea in the *form* of *otherness*"[19] expresses, in philosophical form, a determinate social condition grounded in material reality: "To him, therefore, the whole of nature merely repeats the logical abstractions in a sensuous, external form."[20] It is in the *Manuscripts* that Marx, for the first time with sustained results, deploys his critique of the "standpoint of political economy"[21] – the ideological presuppositions structuring modern scientific knowledge – extending it both to the founders of classical political economy in the First Notebook and to Hegel in the Third.[22] From this perspective, Hegelian philosophy not only mirrors but also legitimates the rupture between humanity and nature, a rupture that the capitalist mode of production necessarily generates and reproduces through the logic of estranged labour: "Hegel's standpoint is that of modern political economy. He grasps *labor* as the *essence* of man – as man's essence in the act of proving itself: he sees only the positive, not the negative side of labor."[23]

The philosophical originality of the *Manuscripts* lies in Marx's ability to read Hegelian philosophy as the conceptual expression of capitalist estrangement. As Marx writes, Hegel "grasps man's self-estrangement, the alienation of man's essence, man's loss of objectivity and his loss of realness as finding of self, change of his nature, his objectification and realization."[24] For Marx, Hegel can speak of nature's "otherness" only because what appears as "otherness" is in fact a real social condition that speculative philosophy unwittingly reproduces.[25] Yet Hegel lacks the analytical means to uncover the historical genesis of this estrangement. For Marx, the overcoming of estrangement becomes conceivable only through a redefinition of the site at which the relation between humanity and nature is materially enacted – namely, labour. The estrangement of nature, which Hegel believes philosophy

[19] Hegel 2004, p. 13, as quoted in Marx 1988, p. 166.
[20] Hegel 2004, as quoted in Marx 1988, p. 166.
[21] Hegel 2004, p. 25.
[22] Hegel 2004, pp. 25-68 and Hegel 2004, pp. 141-168.
[23] Hegel 2004, p. 150.
[24] Marx 1988, p. 161. The first to grasp this aspect with clarity is Lukács 1975, pp. 537-568.
[25] See "Hegel speaks of 'externalization' and its annulment by philosophy. He does not suspect, however, that the philosophy which is supposed to annul 'externalization' is itself an egregious instance of 'externalization.'" (Lukács 1975, p. 551).

must resolve, amounts in Marx's view to a philosophical ratification of a condition that has a concrete socio-historical origin – one Hegel cannot perceive because he remains bound to the standpoint of political economy: "But he expresses this contrast in such a way as to make this externality to nature, its contrast to thought, its defect, so that inasmuch as it is distinguished from abstraction, nature is something defective."[26]

Yet within the capitalist mode of production, this relation becomes structurally distorted. Labour – rather than functioning as the active expression of humanity's relation to nature, and thus as a mode of human freedom – assumes the form of alienation. The worker no longer recognises themselves in the product of their labour and thereby loses access to nature itself, the very point of metabolic contact that now confronts them as an estranged and hostile force. Marx writes: "Thus, if the product of his labour, his labour objectified, is for him an *alien*, hostile, powerful object independent of him, then his position towards it is such that someone else is master of this object, someone who is alien, hostile, powerful, and independent of him."[27] Under capitalism, nature ceases to function as humanity's "inorganic body"; it presents itself instead as an external power – dominated, exploited, and estranged from the human essence it once mediated, fundamentally severed from the very process of life it sustains.

The concept of "*Gattungswesen*" – humanity's species-being – thus acquires in Marx a meaning radically distinct from that found in Feuerbach. Human essence is no longer a natural property but a historically variable capacity to transform nature and oneself through labour. Humanity is "*Gattungswesen*" insofar as it relates to nature in a manner that is at once creative, self-reflexive, and world-constituting. Marx writes: "The animal is immediately identical with its life-activity. It does not distinguish itself from it. It is *its life-activity*. Man makes his life-activity itself the object of his will and his consciousness."[28] From this perspective, nature in the *Manuscripts* is never an original or primordial substrate. It appears only in and through historically specific forms of labour, as a relation continually constituted and mediated by the social organisation of production.

[26] Marx 1988, p. 167.
[27] Marx 1988, p. 80.
[28] Marx 1988, p. 76.

There is, for Marx, no pristine nature to which humanity could return – only a materially mediated nexus that is continuously reproduced through human praxis.

4. *Conclusion*

A comparison between Feuerbach and the young Marx reveals not simply a divergence of doctrines but a divergence of method. For Feuerbach, nature constitutes the immediate and pre-social ground of human essence: emancipation requires a recuperation of an original unity obscured by theology and speculative philosophy. In the *Manuscripts*, Marx decisively breaks with this framework. Nature is no longer an ontological substrate but a historically produced relation, intelligible only through the mediations of labour. What Feuerbach posits as the foundation of human essence is recast by Marx as the product of determinate social forms. This reading stands in sharp contrast to several influential interpretative lines.

A first and dominant orientation – represented by Foster and Burkett – treats the *Manuscripts* primarily as a precursor to the ecological critique elaborated in *Capital*. For Foster, in the *Manuscripts* "Marx was developing a dialectical view which, although inspired by Hegel, took into account the alienation of nature from a materialist perspective" and anticipates the later theory of the "metabolic rift."[29] Burkett likewise maintains, with regard to the young Marx's writings, that "this book only refers to those passages in Marx's (and Engels's) earlier works that do not contradict Marx's mature conceptions of human nature and human labor."[30] Within this developmental schema, the 1844 notebooks matter insofar as they anticipate later categories, not because they generate any conceptual innovations of their own.

A second line – advanced by Clark and Collier – interprets the "inorganic body" as evidence of a residual naturalism and productivism. Clark warns that "the 'inorganic' quality of 'external' nature signifies its instrumental character in relation to an abstracted humanity, which is taken to be the source of all value,"[31]while Collier argues that the "'inorganic body' thesis was not in the foreground for Marx

[29] Foster & Burkett 2000, p. 404 and Foster 2000, pp. 155-162.
[30] Burkett 1999, p. 23.
[31] Clark 1989, p. 245.

himself. It is an aside, and he never works out its implications."[32] According to this view, the *Manuscripts* are theoretically unstable, torn between instrumentalism and an abstract naturalism.

A third position derives from Althusser's classical verdict. The *Manuscripts*, he argues, remain tied to the theoretically disastrous category of "estrangement" and belong entirely to the ideological problematic that Marx would only rupture in 1845. Within this frame, the 1844 notebooks cannot provide any systematic theory of nature: they remain pre-scientific and still immersed in a "philosophical problematic."[33]

Finally, Butler has recently reinterpreted the "inorganic body" as an index of anthropological vulnerability. In her reading, the *Manuscripts* register humanity's dependence: "As mediated, as species, we are always more and less than this body, and this body extends to others and to the conditions of life itself. Neither persistence nor the desire to live can be taken for granted."[34] The category thus signals exposure, not yet socio-material mediation.

The interpretation advanced in this article departs from all four of these orientations. Against the ecosocialist developmental reading, it argues that the *Manuscripts* do not simply anticipate later ecological categories: they already recast the nature-humanity relation in fully materialist terms. Their novelty lies not in forecasting the "metabolic rift," but in discovering labour as the structure through which nature becomes a social relation. Against the naturalist critique, it shows that the "inorganic body" is not an ontological claim about human dependence but a category of historically produced mediation. Against the Althusserian "rupture" thesis, it claims that the *Manuscripts* mark the moment in which Marx first reads philosophy itself – Hegel above all – as a conceptual expression of socio-material estrangement. Against Butler's anthropological reading, the point is that the *Manuscripts* do articulate human dependence on nature in historically specific terms: as a metabolism organized through labor, and therefore open to transformation.

The central thesis defended here is that the *Manuscripts* introduce a new category of mediation: labour as the metabolic nexus through which nature becomes a social relation. "Estranged labour" is thus not

[32] Collier 1991, p. 6.
[33] Althusser 2005, p. 45.
[34] Butler 2019, pp. 14-15.

merely an ethical or anthropological notion. It is the precise mechanism by which capitalism ruptures the human-nature metabolism. The alienation of nature is nothing other than the alienation of labour's mediating function; conversely, the liberation of labour from the determinations of capital would restore – not a pre-social immediacy, nor a pristine nature – but a historically transformed metabolic relation. Seen in this light, nature in the *Manuscripts* is not an ontological given but a social relation produced by determinate forms of praxis. The notebooks therefore do more than introduce the theme of estranged labour: they furnish the first outline of a material critique of the domination of nature, a critique that Marx will later expand in the *Grundrisse* and in the *Capital*.

A final consequence follows with theoretical urgency. If nature is produced – and estranged – through determinate forms of labour, then human emancipation and the emancipation of nature coincide not by identity of essence, but by identity of mediation grounded in labor itself. Already in 1844, Marx locates the possibility of ecological emancipation not in a return to immediacy, but in the reorganisation of the socio-material metabolism that binds humanity to nature.

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The Reversal of Ends, On Limit and Purpose in Marx's Critique

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Abstract

The research explores the vast semantic field of end, purpose, and limit in *Das Kapital*. This linguistic methodology acknowledges Aristotle as a key source for critiquing the economic and religious culture of limitlessness. Marx utilizes the Aristotelian distinction between economics and chrematistics to demonstrate the reversal of ends. The results show capital's circulation is an infinite movement, without limit or end. This operation is deemed purposeless because of its limitless expansion. This fetishism establishes surplus-value making as the sole end and aim of humanity, constituting the new secular cult. The implications are profound: Marx defines humanity as a social animal characterized by shared intentionality. Since purposes are given by the workers, limitless exploitation is not an ineluctable historical-geographical end of history, but a mere accident of it.

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Keywords: Marx, Aristotle, Aim, Purpose, End, Limit, Bound, Barrier

Marx is not an academic topic for me, but a working tool for criticizing the political economy of the Anthropocene.[1] Marx uses the concept of end to criticize the capitalist mode of production and its dominant religion. Thanks to the semantic field of end (which contains the concepts of limit and *purpose*), Marx describes the mode of production of the Anthropocene as an (economic and religious) culture of limitlessness; something very similar to what Serge Latouche argues: "The Western paradox lies in the fact that the West, in a sense, establishes a culture of limitlessness" (Latouche 2012, p. 39). This vast semantic field of end, purpose and limit is what allows us to better understand the *critique of political economy,* which is the new field of knowledge opened up by Marx. The neglect of these concepts derives from the Marxist-Leninist tradition, which did not consider Aristotle as one of Marx's sources: today the time has come to carry out a *Deleninization* of Marx's thought and words.[2]

1. *Aristotle, the great thinker of limits*

I will not follow the current interpretations (McCarthy 1992; Levine 2021; Jaffe 2016) that see Marx in a humanist perspective: as a classical humanist rather than a materialist thinker. In my view, Aristotle is a materialist scientist (as Marx himself defined him) and also the anthropologist who discovered economics, as Polanyi defined him. Marx certainly read Aristotle in a Hegelianized way, that is, dialectically-deductive, rather than dialectically in the ancient sense of problematizing and tending to bring different points of view into dialogue (Natali 1983, p. 187).[3] Aristotelian concepts dominate the difficult beginning of *Capital,* which takes up three core topics from Aristotle:

– the definition of wealth;
– the distinction between economics and chrematistics;
– the distinction between use value and exchange value.

[1] My research is pedagogical, oriented towards understanding how screen time reduces the cognitive potential of the upcoming generations.

[2] Lenin abolished all references to Aristotle from Marx's sources.

[3] Marx interprets Aristotle through Biese's Hegelian reading. Aristotle's logic is appreciated by Hegel (Jaulin 2016). In his youth, Marx translated *De Anima*. Aristotle's impact on Marx has certainly been underestimated up to now. I therefore agree with Vadée: "When Marx is quoting philosophy, Aristotle's categories come to mind as well as Hegel's! This is perhaps a conscious choice, isn't it?" (Vadée 1998, p. 322).

Thanks to Polanyi, we now know that Aristotle discovered economics precisely because he lived in a historical period in which "he could observe the emergence of money" (Polanyi 1968). Finally, according to Aristotle, the end can be expressed in different ways, as can the limit. In *Metaphysics*, referring to the polysemy of the concept of limit, he notes: "The end is also the limit of each thing: in this sense, the limit is that towards which movement or action tends" (*Metaphysics*, V, § 17, 1022a).

Marx has a completely materialistic idea of finality and the *semantic field of the end* is essential to understanding *Das Kapital, Kritik der politischen Ökonomie, Erster Band*, which is the only work Marx published and the subject of my analysis (Lanza 2019; 2025). The German word *das Ende* has the double meaning that persists in French, in Italian and also in English, where it means *end* and also *purpose*. In this work the wider semantic fields are those of "work" (*Arbeit*) and "capital" (*Kapital*) with 6,430 and 2,233 occurrences, respectively. The semantic field of "value" (*Wert*) also features prominently, with 1,952 occurrences. The semantic field of end/purpose/limit with 592 total occurrences is still significant.[4] This field includes the following German terms and their respective counts in the first book of *Das Kapital*:

German Term	Occurences	Meaning
End*	211	*End, Aim*
Zweck*	89	*Purpose, Aim, End*
Ziel*	25	*Goal, Aim*
Grenz*	69	*Limit, Bound, Boundary*
Schrank*	75	*Barrier, Limit,*
Semantic field of End	469	

[4] Marx, following Hegel, distinguishes between limits: *Grenze* is an external, physical boundary, while *Schranke* is the intrinsic, systematic, qualitative determination of a concept. However, the complexity of Marx's use of these terms was noted by the Italian translator Fineschi, who observed that the solution of translating *Schranke* as *barrier* and *Grenze* as *boundary* proved to be inapplicable in a consistent manner throughout the text. Marx, after all, does not possess the linguistic cult of Hegel. This semantic ambivalence suggests instead that Marx's language is polysemic, similar to that of Aristotle, without strictly adhering to a rigid Hegelian linguistic differentiation.

The 469 occurrences of the end/purpose/limit semantic field holds a significant place, as it is greater than that of alienation. The terms associated with alienation, Veräußern* (37) and Enfremd* (7), have a combined total of only 44 occurrences. Let's remember that Marx's style is not very "Marxist": his *esprit critique* is quite far from being an *esprit de système*; rather, it is dense with literary metaphors. In particular, note that he does not use some of the key concepts of the Marxist tradition, such as: *historical materialism, dialectical materialism, capitalism, ideology, base (or substructure) and superstructure*.[5]

2. *Value*

Marx draws on Aristotle precisely in the difficult opening chapter of his work, where he explores different concepts and their relationships. His well-known starting point is the definition of wealth, and therefore of value: "The wealth [*der Reichtum*] of those societies in which the capitalist mode of production prevails, presents itself [*erscheint*] as an immense accumulation of commodities" (K., I, § 1, p. 45). However, it is use values that "constitute the substance of all wealth [bilden den stofflichen Inhalt des Reichtums]" (p. 46). Some things only have use value and are not commodities: "air, virgin soil, natural meadows, & c." (p. 50). Aristotle is described as "the great thinker who first analyzed the form of value" (K., I, § 3, p. 69), while Marx explains its content. However, the concept of wealth is defined by the priority of use value over exchange value: use values constitute the material substance of all wealth, whatever form it may take in different societies. The separation between wealth and money is essential, because only part of energy becomes work and only part of work becomes value that creates money.

However, value derives both directly from nature and indirectly through the mediation of work, which always has a purpose: "every other element of material wealth that is not the spontaneous produce of Nature, must invariably owe their existence to a special productive activity, exercised with a definite aim [*zweckmäßige*]" (K., I, § 2, p.

[5] Using Benveniste's semantic field theory, my research attempts to analyze Marx's literary style (Silva 1971), trying to reconstruct the polysemic meanings of concepts and metaphors within the critique of political economy (Lanza 2019; 2025). The still-ongoing research is based on textual analysis of the original text and translations, the use of glossaries, and also statistical methods using the *Voyant* program.

52). Everything that constitutes material wealth is created by human beings through work keeping this purpose in mind: the purpose is therefore essential to define the meaning of work and wealth. The enormous planetary effect resulting from the new production aim (Money) began in the 16th century. This is evident in the agricultural sector, where the replacement of workers with machines is "more intense" than in factories, leading to a surplus of labor: "Capitalist production completely tears asunder the old bond of union [*Die Zerreißung des ursprünglichen Familienbandes*] between agriculture and manufacturing." (K. XIII, § 10, p. 506, rev. trans.; MEW, p. 528). Consequently, capitalist production "disturbs the circulation of matter between man and the soil"; still more specifically, it "violates the conditions necessary to lasting fertility of the soil".[6]

3. *Chrematistics*

The fourth chapter *Das Kapital* begins by explaining that the capitalist mode of production emerged in the 16th century and that money "is the first phenomenal form of capital". The current era, critically recognized on the basis of its effects as the Anthropocene, can only truly be interpreted by examining its root causes: a fundamental reversal of ends. This reversal originated in the historical rupture of the 16th century, when Marx described the capitalist mode of production as an economic and religious culture of limitlessness.[7]

[6] It is useful to remember that in English, Rift refers more to rocks, the sky, and inorganic nature, while in German, the relational connotation of Riß is fundamental. The concept of unheilbaren Riß ('irreparable tear') in Book III of Capital should be approached in the same way as that used in Book I (ch. K., XIII, § 10), where Marx summarizes the impact of the industrial revolution on agriculture with the term Zerreißung (a more violent and destructive process, both physical and emotional). The same root (reißen) describes the tearing of social and natural bonds. So here, rather than a Rift Theory, we are faced with a process of social and natural laceration.

[7] In a certain sense, the concept of the *Anthropocene* has moved beyond the field of geology and has been adopted by the humanities as a synonym for modernity, while various Marxist currents propose replacing it with *Capitalocene*. In my opinion, the geological aspect cannot be ignored: the history of the planet has entered a phase characterized by mass species extinctions and atmospheric changes, which in the past were caused only by telluric forces. Today, however, similar changes are caused by humans with a telluric impact. The interesting discussion focuses precisely on the dating of this change. In this sense, I agree with the l*ong durée* positions of old historiographical approaches (Braudel, Wallerstein, Cipolla, Galeano) but also those

From an Aristotelian perspective, the C—M—C cycle differs from the M—C—M cycle precisely because of the end and the purpose of the movement [*Bewebung*]. We are dealing with an infinite movement, without limit or end: "it appears to be an operation as insipid [*abgeschmackt*] as it is purposeless [*zwecklose*]" (K., IV, § 1, p. 161, rev. trans.; MEW p. 165). Being without end (limitless) equals being without purpose (purposeless): right here in these pages, Marx introduces the concept of *surplus value* and explains that the *movement of surplus value* is a purposeless movement.

At the end of this passage Marx summares his view as follows: "The circulation of money as capital is, on the contrary, an end in itself [*Selbstzweck*], for the expansion of value takes place only within this constantly renewed movement. The circulation of capital is in fact without measure [*masslos*]" (K., IV, § 1, p. 163, rev. trans.; MEW p. 167).

In the following note 6 of Chapter IV, then he quotes Aristotle: "Therefore also wealth [*Reichtum*], such as Chrematistic strives for, is unlimited. Just as every art that is not a means to an end, but an end in itself *[letzter Endzweck gilt]*, has no limit to its aims, because it seeks constantly to approach nearer and nearer to that end, while those arts that pursue means to an end, are not boundless [*unbegrenzt*], since the goal itself [*Zweck selbst*] imposes a limit [*Grenze*] upon them, so with Chrematistic, there are no bounds to its aims, these aims being absolute wealth. (...) By confounding these two forms, which overlap each other, some people have been led to look upon the preservation and increase of money ad infinitum [*unendliche*] as the end and aim [*Endziel*] of *Ökonomik* (Aristotle)" (K., IV, § 1, p. 163, n., rev. trans.; MEW p. 167 ; cf. P., 1257b). In translating Aristotle into German,

of more recent ones (Mann), specifically sharing those of Lewis and Maslin (2018), which are close to those of Moore (2016). Specifically, the reversal of ends described by Marx applied to the market for land, labor, and money, i.e., the main factors of production, was a driving force in the creation of the great Pangea, violently tearing millions of humans from their lands for the first time. Marx was unequivocal: "world trade and the world market opened up modern capital life in the 16th century." While acknowledging valid criticisms (Moore; Barca; Malm) that prefer the term *Capitalocene* to emphasize the historical specificity of capital in ecological destruction, I prefer to retain the term Anthropocene. The challenge in the future may be that a non-capitalist society will have to deal with the social and natural destruction that capitalism will leave behind. In this sense, we hope today for socialism in the *Anthropocene*, and we cannot think of a socialism that overcomes the Anthropocene.

Marx modifies Stahr's German translation of Aristotle with two terms taken from modern political economy: *Ökonomik* and *Chrematistik,* modernizing the reading of Aristotle (Natali 1983, p. 167).[8]

Aristotle is useful to Marx in explaining that exchange in the capitalist mode of production is an infinite movement, without limit, without purpose.[9] The two cycles can be distinguished by the final purpose (*Endzweck*) or the ultimate goal (*Endziel*). In economics it is limited, unlike in chrematistics, where it is endless.

The radical and fundamental point is that Marx uses Aristotle to explain that the limitlessness of the movement of commodities in the capitalist mode of production is an insipid and purposeless operation. For both Aristotle and Marx, ontology and axiology do not coincide but neither can one be explained without the other; the key concept of purpose is essential to this operation on human praxis.

However, Marx develops the concepts of end, purpose and limit to apply his critique of the capitalist mode of production in at least four other sections of *Capital* that explain the depth and importance of these concepts suppressed by the Marxist tradition:

– the struggle for the working day; the natural and insuperable concept of the limit of the day is introduced to explain the concept of the class struggle, which revolves around time limits: the maximum length of the working day and the minimum age of the worker.

[8] "He adds very few personal contributions to the transcription: among the most notable are the transformation of the terms Hausverwaltungskunst and Gelderwerbskunst, used by Stahr, into Ökonomik and Chrematistik. In this way, Aristotelian theory is somewhat modernized" (Natali 1983, p. 167). Marx reorganizes Aristotle's text, deduces its internal logic, and retranslates it in a simplified form: "Marx uses Aristotle's work more as an aid in constructing his critique of modern economics than as a source for reconstructing ancient economics" (Natali 1983, pp. 176-177).

[9] Foster and Clark (2020) link capitalism's "economy of robbery" and metabolic rift to the expropriation of land and labor, drawing Marx near Polanyi. They, however, inexplicably distance Marx from Aristotle, asserting his broader critique relies on the Hegelian framework: "In developing this wider critique of the system, Marx employed the Hegelian dialectic of barriers and boundaries." (Foster & Clark 2020, p. 47). After all, this idea that Marx's concept of boundary is understandable within the dialectic of functional limits, where obstacles are redefined by development. The idea that the articulation of capital is a dialectic of functional limits to development, where barriers constitute propelling elements, constitutes the classical Marxist interpretation (Negri 1979, p. 127; Calabi 1975; Cesarale 2018). In reality, the dialectic of limits must be encompassed within the dialectic of ends, following Aristotle's categories used by Marx.

– the critique of technology and capitalist progress, where Marx explains very well how the arts and techniques of the crafts were functional to the use value, in the modernity technology serves the capitalist in the class struggle against the worker; the entire history of the struggle shows how technologies are used for this sole purpose in order to increase the exchange value.

– the critique of the expropriation and robbery of the common land, which can only be understood with the concept of purpose and natural limit.

– the critique of capitalist religion and the theological role of the economy (fetishism).

I cannot quote here the constellation of passages from *Capital* that concern these four criticisms, where the concepts of end, purpose, and limit exercise their critique. I will only focus on the fourth and last aspect because here Marx uses Aristotelian concepts to criticize the finalism of Hegel and Kant. His arguments also allow us to critique Nietzsche's idea of the Modernity as the end of religion.

4. *The ultimate aim in the modern religion*

The new religion of money is mysterious because money leaves no footprints. In the Modernity, religion operates invisibly: "The intermediate steps of the process vanish in the result and leave no trace behind. […] Hence the magic [*Magie*] of money. […] Hence the riddle of the money fetish [*Das Rätsel des Geldfetischs*] is therefore only the riddle of the commodity fetish that has become visible and dazzles the eyes" (K., II, § 10, p. 113 rev. trans.; MEW p. 108). The power of the secular cult (*weltlicher Kultus*) for a secular God (*weltliche Gott*) lies precisely in the invisibility of the Money God in the world. If the power of modern religiosity is therefore invisible, this does not mean that the Idol is not visible. However, the Idol is only recognizable ("commodity fetish dazzles the eyes") if we describe its cult and its religious character: according to Marx, the Modernity is not an era without deities, but a world enchanted by the idolatry of Money. In the name of Money, in the Anthropocene we sacrifice plant, animal and human lives, and we remove or deport people and peoples. Recently, Latouche described the elements of this religion: Growth is the cult; progress is an article of faith; shopping malls are the sacred places; the temples of the economy are the market and the

department stores; advertising is its creed; consumption is its liturgical ritual; sales are its ritual festivals; competition dictates the Tables of the Law; its mysteries are the tax havens accessible to a few initiates. Faith in money has always required religion, as we are well reminded by the American banknotes that read: "In God We Trust" (Latouche, 2019). Marx no longer uses the term ideology in *Capital* because the object of his critique is precisely the "sensible suprasensible" [*sinnlich übersinnliches*] (K, I, §4, p. 82, rev. trans.; MEW p. 85) power of Money. This critique is very similar to Benjamin's in *Capitalism as Religion*, where he describes the uniqueness of the capitalist religion (Dussel 1993).

While Nietzsche claims to be carrying out a *revaluation of all values* (*Umwertung aller Werte*) and describes the Anthropocene as the age without divinity (the end of idols), Marx reveals the mysterious, the invisible, the *surplus value* (*Mehrwert*), the hidden and worshiped god of this age. Having reversed the ultimate purpose, the Anthropocene Age is not the end of values, but the triumph of the unique value & thought and ultimate purpose. In this age dominated by fetishism, goodness has been replaced by Value.

In light of all that has been said about the semantic field of end, limit and purpose, we can now understand Marx's critique of the philosophy of history of Hegel and Kant, who interpret capitalist modernity as the end of history: according to Hegel and Kant, history had ended with the capitalist world mode of production, which they described precisely as the sole end and aim (Marini 2004). In Marx's view, the aim of the capitalist mode of production is instead fetishism, the religion of Money: capitalist globalization, the new Pangea of the Anthropocene, indeed has a global religious leveling effect, whose ultimate goal is fetishistic globalization: "It was 'the strange God' who perched himself on the altar cheek by jowl with the old Gods of Europe, and one fine day with a shove and a kick chucked them all of a heap. It proclaimed surplus-value making as the sole end and aim of humanity [*letzten und einzigen Zweck der Menschenheit*]" (K., XXIV, § 6, p. 742; MEW p. 782).

But what Kant and Hegel present exactly as the end of history and the final purpose of history is, in Marx's view, nothing more than the idolatry of Money, the religious and economic characteristic of the Anthropocene.

5. *Social animal*

According to Marx, the human species remains a *zòon politikón:* "man is, if not as Aristotle contends, a political, at all events a social animal [*gesellschaftliches Tier*]" (K., XI, § 1, p. 331; MEW p. 346). This quotation should be interpreted correctly by following Iacono: "in today's terms Marx advocates a system where there is *shared intentionality*", that is, "a cooperative faculty that precedes civic organization" (Iacono 2018, pp. 42-44). The *zòon politikón* is characterized by praxis, that is, activities in the realm of necessity (which link us to the organic exchange with nature) as well as in the realm of freedom. In describing the human being as characterized by work, Marx points out the difference between the architect and the bee in the presence of purpose, that is, the common human intention that orients and enables the human work of mediation.

According to Vadée: "The human being, that is, each individual, is the end and purpose of himself, the ultimate end [*Endzweck*]. Marx understands history as having a human meaning, this ultimate end being the free development of human faculties and potentialities" (Vadée 1998, p. 492). Thanks to the biological sciences (Tomasello), we know that our practice of self-transformation of the surrounding environment unites us with lizards, squirrels and primates, but that it also has specifically human characteristics: we are *born to cooperate* and our mind is formed in an extracortical way thanks to joint attention and joint intentionality, which precede and enable the development of language, both ontogenetically and phylogenetically. If human beings have a particular language it is because they are "animals equipped with speech" and not because they are rational, just as Aristotle argued when he defined Man as a *zoòn lògon èchon*. However, thanks to Tomasello, today we know that human communication is an exchange of intentionality and not a simple exchange of information.[10]

[10] In light of current biological debates on human qualities, the key question is no longer the difference between a beaver's dam and a human's. Human dams have caused the migration of a hundred million other people. Marx's idea of humans as architects who first plan their creations, or as tool-making animals, is not what is relevant today. What matters is shared intentionality and joint attention – elements of a cooperative psychological structure that precedes language and enables its transmission from generation to generation.

6. *Conclusion*

Marx's lesson is that purpose does not develop historically according to a *telos*, but is immanently given to human beings to orient their activity, especially the collective organization of work. Money became the sole end and aim of humanity only when two limits were broken: when land and labor became productive factors, that is, commodities on the world market. The Anthropocene is the biogeological effect of the destruction of the human capacity to set aims through the unlimited exploitation of land and human labor. It is characterized by the idolatry of money, which becomes the dominant characteristic of an age, the sole and ultimate end of production. Marx therefore borrows from Aristotle to go beyond the Anthropocene. Thanks to the vast semantic field linked to end, limit and purpose, the critique is applied to the object of the class struggle, that is, to the timing of work (working day and age); it is applied to the exploitation of nature and the deportation of populations from the indigenous, to the blacks, has generated, reaching today's forced migrations; it is applied to technical progress and technological regression; it is applied to the critique of religion understood as the fetishism of Money and the general character of an entire age. This critique cannot be understood without the concept of the end, in the double meaning of purpose and limit.

Precisely because the purposes are given by the subject (by the workers) and not by the object (capital), the capitalist mode of production is not an ineluctable historical-geographical destiny, but a mere accident of history. With Marx, the post-human and materialist meaning of purpose is not left to the religious power of the fetish for which there is always an ultimate purpose of Money, but is entrusted to human becoming, to the struggle of human beings for a better world. Marx's concepts of end, purpose and limit are essential today to move towards a free association of individuals who set limits and goals for themselves.

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Nature and Society: Revisiting Marx's early ecological reflections through Spinoza

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Abstract

In the *1844 Manuscripts*, Marx's considerations on alienation delineate the gradual subsumption of social life under capital. At the same time, this process of subsumption constitutes a specific ideological representation, i.e. an image of nature as a distinct entity that serves capitalist relations of production and eventually merges with them. Therefore, insofar as the 'domination' over nature takes on an increasingly coherent form based on a generalised sense of possession, humanity is unilaterally pinned down to property and relations between *things* within a homogenised existence that becomes largely anthropocentric. Following Spinoza's view that society and the natural world constitute modes of a single substantial order and, also, that every singular thing is embedded within the infinite complex of natural causes, we will try to unpack Marx's early ecological reflections. We argue that Marx not only understands the critical interconnection between human activity and nature, but also shows that the dynamics of community constitute the locus of agreement or balance between individuals and the natural world.

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Keywords: Marx, Spinoza, Nature, Society, Alienation

1. *Introduction*

In this paper, we will argue that Karl Marx's *Economic and Philosophical Manuscripts* (1844) develops a dynamic and historicised conception of nature, expressed by the formula 'naturalism = humanism'.[1] To elucidate Marx's 'dynamic naturalism', we read the critical categories of the *Manuscripts*, alienation, capitalist subsumption and communist sociability, through Spinozist lenses. Specifically, we aim to show that this 'Spinozist detour' foregrounds the ecosophical rather than purely ecological character of Marx's critique, thereby repositioning its relevance vis-à-vis current discussions in political ecology.

Our exposition unfolds in two stages. First, we briefly situate our reading regarding recent accounts that treat the *Manuscripts* as the locus of the Spinoza-Marx encounter. Subsequently, we undertake a close reading of Marx's *Manuscripts* and, with reference to Spinozist themes, show that Marx conceives of a 'natural and historical continuum' of human and nonhuman agency. We acknowledge that, if human nature is primarily defined by its capacity to transform the conditions of its own activity and reproduction, while nonhuman nature provides the conditioning milieu in which this transformation historically unfolds, Marx's schema appears tied to the instrumentalisation of nonhuman nature and to human privilege. However, as we argue, a more delicate exchange between the two poles of 'dynamic naturalism' is possible, residing in 'the becoming' of communist sociability, which emancipates all forms of human and nonhuman relationality. Finally, we conclude that Marx's concerns in the *Manuscripts* can be understood as ecosophical, according to Guattari's tripartite definition of ecosophy based on a mental, social, and environmental register.[2]

[1] Marx 1992, p. 354.
[2] Guattari 2000, p. 41.

2. *Readings of Marx's 1844 Manuscripts in recent literature*

A comprehensive overview of the works exploring (young) Marx's intellectual affinities with Spinozism seems impossible, let alone within the limited scope of this paper. Notably, alongside Althusser, who set the tone by declaring that 'we can regard Spinoza as Marx's only direct ancestor from the philosophical standpoint',[3] figures such as Macherey, Balibar, Negri, Matheron, and Tosel, among others, have highlighted Spinoza as a key reference in their interpretation of Marx.[4] Despite their differences, these readings commonly identify that Marx's attraction to Spinozism lies in the question – pressing for both Spinoza and Marx – of 'how to think about humans as at once fully determined by their material conditions – governed by the laws of nature – and also capable of changing those conditions'.[5]

Particularly concerning Marx's early writings, Spinozism is seen as the catalyst that enabled him to move beyond the dualistic schemas that defined the debates among the young Hegelians.[6] In fact, it is in the *Manuscripts* where Marx's critique of such dualisms becomes more intense, leading to their resolution:

> [i]t can be seen how subjectivism and objectivism, spiritualism and materialism, activity and passivity, lose their antithetical character, and hence their existence as such antitheses, only in the social condition […] that the resolution of the theoretical antitheses themselves is possible only in a practical way, […] and how their resolution is for that reason by no means only a problem of knowledge, but a real problem of life […].[7]

Crucially, as the above extract reveals, Marx reverses the traditional schema that prioritises theoretical over practical knowledge and foregrounds knowledge acquired through worldly human activity. More recently, several commentators have paid tribute to the *Manuscripts* as the key textual reference for the Spinoza-Marx connection. In this context, Franck Fischbach contends that Marx's texts themselves invite a Spinozist treatment, and that 'the Spinozist detour is to some extent

[3] Althusser et al. 2015, p. 250.

[4] See Fischbach 2023, p. 15. We should add Lordon 2014 and Kordela 2018 to the list of figures above.

[5] Matysik 2022, p. 2.

[6] See Fischbach 2023, pp. 15-17.

[7] Marx 1992, p. 354.

already included and required by them', especially 'the *1844 Manuscripts*'.[8] Similarly, Bianchi argues that it is with the *Manuscripts* that Marx's materialism becomes distinctly Spinozist, emphasising, though (contra Fischbach), Feuerbach's influence in this development.[9] On her part, Matysik takes up a historiographic rather than theoretical exploration of Marx's early immersion in Spinoza. Focusing on the 'enigma' of his thorough note-taking on Spinoza's *Theological-Political Treatise (TTP)*, while completing his doctoral dissertation on Ancient Atomists, she traces Marx's interest in Spinozism to themes explored in the dissertation itself.[10] As she argues, Marx seemed to have found in Spinoza 'a puzzle very similar to the one he was exploring in his treatment of Epicurus and Democritus and that he would continue to ponder all his life', namely the possibility of reconciling natural determinism and freedom, necessary for socio-political emancipation.[11]

In addition, Fischbach is concerned with broader questions about Marx's method, especially whether it is possible to isolate the philosophical component of Marx's thought from the compound of methodologies and discourses that comprise his writings.[12] He proposes a hermeneutic strategy based on the eclectic affinities between Marx's 'philosophical practice' beyond his castigation of abstract philosophy, and the ethical and political implications of Spinoza's naturalist ontology.[13] According to Fischbach, the aim is not to reconstruct a systematic philosophical corpus of Marx, which would betray his anti-dogmatic aspirations, but, with Spinoza's aid, to instigate unexpected effects in Marx's texts – especially the *Manuscripts* – opening them up in new directions for critical engagement. Such 'productivist hermeneutics' can be traced back to Althusser's assertion that the

[8] Fischbach 2023, pp. 20-21.

[9] Bianchi 2017.

[10] As Matysik points out, there is an ambivalence among scholars about how to interpret Marx's notes. According to Matheron, Marx may have been projecting his own ideas onto Spinoza or finding in Spinoza a foil for those ideas. On the other hand, Rubel has argued that the young Marx found in Spinoza's TTP a 'guide to an "ethics of democracy" that not only would facilitate his political radicalisation in the early 1840s'. See Matysik 2022, p. 99.

[11] Matysik 2022, pp. 1-2, 108.

[12] Fischbach 2023.

[13] 'While there is a critique of philosophy in Marx, this critique would still be a determinant practice of philosophy'. Fischbach 2023, p. 2.

truth of a philosophy exists 'not as a Presence but as a Product'.[14] In a similar vein, Matysik claims to be attentive to 'the materiality of the text', with her own method following 'the imperative to read Spinoza and Spinozism as a series of products or effects'.[15]

Conclusively, we may note that, while Fischbach and Matysik readily accept the historiographic risks of their projects, they seem rather ambivalent about affirming their theoretical implications. Being overly cautious in framing the validity of their readings with regard to 'the effects produced' through the 'material connections' of the texts betrays a certain uneasiness in addressing these texts philosophically. Perhaps a remnant of the everlasting debate around the theme of rupture, or 'epistemological break', a term introduced by Althusser on account of the discrepancy between the 'humanist' vocabulary of the *Manuscripts* and the anti-philosophical quality of Marx's later writings.[16]

3. *From individualism to collective activity*

Marx's central idea in the *Manuscripts* is the following: a) social reality evolves through contradictions that result in the separation of human beings from their essence (or the separation of subjects from themselves); b) this 'nuclear' division occurs through the subsumption of the whole of social life under capital; c) it therefore becomes necessary to formulate a materialist and historical critique that will reveal the generalised alienation of the human species and seek a way out.[17]

It is widely agreed among scholars that young Marx's thought is primarily anthropocentric.[18] From this perspective, many argue that Marx never departed from the well-known idea of man's domination

[14] Althusser 1976, p. 137.

[15] Matysik 2022, pp. 12-13.

[16] Althusser 2005, p. 33. On the status of the *Manuscripts* within the corpus of Marxism and beyond, see Musto 2015.

[17] Rancière 1996, pp. 85-89. As Marx writes in a letter to Ruge: 'In order to secure remission of sins, mankind has only to declare them for what they actually are'. Rancière 1996, p. 85. See also Maramathas 2015, p. 58.

[18] On Althusser's criticism of young Marx's humanism, see Althusser 2005; Althusser et al. 1996. Foster claims that the abstract concept of alienation of nature was surpassed by his materialist concept of the metabolic rift. See Foster 1999, pp. 398-399. Cf. Marcuse 2023.

over nature, which treats nature merely as a means to satisfy human needs. Consequently, they contend that there cannot be a genuinely ecological Marxist thought.[19]

Although the *Manuscripts* apparently articulate an anthropology based on the assumption that the essence of man is grounded in his labour, we will argue that young Marx, *by privileging collective activity over individualism and property*, highlights an ecological orientation based on concepts such as 'sustainability' and 'agreement between humanity and nature'. We believe that our reference to some of Spinoza's main metaphysical doctrines can enrich the Marxian problematic while also highlighting its limits.[20]

4. *The state of alienation: alienated labour and the separation of humanity from nature*

The materialist starting point of the *Manuscripts* is placed in what Marx describes as 'an actual economic fact'. With the prevalence of this phenomenon, the separation of human beings from their essence through the alienation of labour is irreversibly put into effect.

More specifically: a) the increase in the production of commodities and, therefore, the utilisation of the world of things, brings about the devaluation of the world of humans; all useful things appear in the commodity form; b) the more commodities the worker produces, the more his labour is transformed into a commodity, thus the more he himself is subordinated to the commodity form and the more he is devalued; c) labour produces and reproduces itself and the worker as commodities, consequently the product of labour appears as something alien to the producer, as an independent power over him; d) therefore, labour is substantialised to a thing (i.e. the commodity) and is objectified; this objectification appears simultaneously *as a loss of the object and as an enslavement to the object*, while

[19] McLaughlin argues that Marxism has no interest 'in the liberation of nature from human domination'. See McLaughlin 1990, p. 95. For Eckersley, any attempt to articulate a Marxist ecocentric perspective will distort Marx's theoretical concepts. See Eckersley 1992, pp. 94-95. Foster defends the ecological orientation of Marx's thought, even in the early period. Cfr. Foster 1999, pp. 373, 386, 397.

[20] Matysik implicitly acknowledges a Marxist inclination toward the notion of human autonomy, an idea that needs to be delimited. See Matysik 2022, p. 226.

appropriation appears as estrangement and alienation (*Entfremdung* and *Entäußerung* respectively).[21]

The above terms carry significant meaning in relation to the process of separation. *Entfremdung* refers to the condition in which something becomes strange to itself – i.e., alienated – and subordinate to an external power. *Entäußerung* means that something moves outside itself – into the world of things or commodities – and is therefore 'externalised' or expressed in something else. The process of separation – through the poles of *Entfremdung* and *Entäußerung*, that is, through its negative and positive movement – results in the subsumption of social life under commodity and money, as well as in the separation of human beings from their essence, namely their labour.[22]

But what is labour in its essence? According to young Marx, labour is defined as the conscious *mediating* and transformative activity that develops between humanity and nature. Labour constitutes an indissoluble relationship among two non-reducible poles. From this perspective, the predominance of the world of capital and commodities devalues the world of human beings by distancing them from their essence: that is, it brings about the separation of an *original unity* between the producers and the nuclear conditions of their production. These 'conditions' are in a sense expressed *in the relation of the worker with nature*. Thus, the predominance of the world of commodities not only alienates human beings from themselves, from the product of their labour and from their productive activity, *but also distances them from nature itself*.[23]

The argument of the *Manuscripts* can be summarised as follows: since humans cannot create anything without nature, and since they must maintain a constant dialogue with it, it follows that physical and mental activity is connected to nature, and therefore, 'nature is con-

[21] In Marx's description 'labour appears as loss of reality for the workers; objectification as loss of the object and object-bondage; appropriation as estrangement, as alienation'. See Marx 1988, p. 71; 1968, pp. 511-512; see also Rancière 1996, p. 98.

[22] Balibar 2017, note 45, highlights this distinction. See also Marx 1968, pp. 511-512.

[23] Marx's main argument is that, as long as labour is the essential element of sustaining the relation between humanity and nature, it follows that the 'estranged' or 'alienated' labour takes the form of a continuous separation from nature. See Marx 1988, pp. 75-76. According to Saito, from the Manuscripts and onwards, Marx's conception of labour's nature (i.e. mediating and transformative activity) remains largely stable. See Saito 2022, p. 219; 2017. Foster highlights the 'complex interdependence between human beings and nature' which is presented in the Manuscripts. See Foster 1999, p. 381.

nected to itself since man is part of it' [*die Natur mit sich selbst zusammenhängt, denn der Mensch ist ein Teil der Natur*].[24] The historical moment of the prevalence of the relation between capital and wage-labour brings about the universal power of the world of commodities and breaks *precisely* this primary unity of human beings with nature, alienating humanity from the natural conditions of its existence.

5. *Communism as a state of sustainability: the emergence of the unity of man and nature in the form of collectivity*

The complete subordination to the commodity form leads, according to Marx, to the social practice of possession and to the ideological practice of its 'deification'. The combination of individualism and property, as alienation, clearly describes a state of decay: by replacing all senses by the sense of owning [habens], 'property' as Marx argues 'made us utterly stupid and one-sided' [Das Privateigentum hat uns so dumm und einseitig gemacht].[25] Thus, labour and its products, the natural tendency of human beings to cooperate and coexist, and every conscious vital and productive activity – physical and/or intellectual – are subjected to the commodity form, eventually becoming means for the perpetual reproduction of the real abstraction of the money form.[26]

Communism, as described in the *Manuscripts*, transcends private property and removes alienation through the restoration of the *unity* of humans and nature. This unity is secured through *collective or social activity*, that is, through the realisation of human's social essence. Society, in its communist form, by restoring the 'harmonious' dialogue between human beings and the natural world, constitutes, as Marx declares, the 'perfected unity of human's essence and nature' and, thus, expresses 'the actualised naturalism of man and the actualised humanism of nature' [der durchgeführte Naturalismus des Menschen und der durchgeführte Humanismus der Natur].[27]

[24] Marx 1968, p. 516.

[25] Marx 1968, p. 540; 1988, p. 131. In Spinozist terms, Marx describes the consuming sense of ownership and the stupidity it generates as a one-sided passion. The affective aspect of the *Manuscripts*, although crucial for the argument, remains largely unexplored. See also Spinoza 1985, p. 571.

[26] For the crucial role of money form in Marx, see Lotz 2014. For the importance of 'form analysis', see Heinrich 2004, p. 85.

[27] Marx 1968, p. 538; 1988, p. 104. Kangal emphasises that Engels believed Marx's most significant unfinished work was the *Dialectics of Nature*, a project aimed at synthesising philosophy and the natural sciences. See Kangal 2020, p. 112.

Communism resolves the conflict between humanity and nature which is founded on the basis of a false dualism. The 'law of capital' produces this dualism, since it reconstructs all things as commodities and therefore reconstructs nature as inherently commodified and infinitely exploitable. On the contrary, communal activity not only affirms the real connection between people through cooperation, but creates a new *collective consciousness* through the cultivation of all senses [sinne]. This 'sensory', 'affective' and 'cultural' dimension of the *Manuscripts* should not be ignored, as through it, humanity elevates the totality of its creative powers and operates collectively to achieve a sustainable and high-quality life in accordance with – or in 'balance' with – nature, moving toward a 'fully-developed' humanism and naturalism.[28]

In conclusion, Marx addresses the problem of this essential separation, caused by the capital-labour relation, through the dynamic of collective activity. Since humanity relates to itself through its 'working communication' with nature, it follows that its relationship to the natural world is fundamentally social. Therefore, there is no individual relationship with nature of any kind. That's why the atomocentrism and possessive individualism produced by the capitalist condition constitute, primarily, an alienation. *The only 'real' relationship with nature is constructed through the social or communal form*.[29]

6. *Spinozist limits: the eternal laws of nature, the overdetermination of singular things and the various levels of power*

But how will communist society achieve this 'real' relationship? In an important observation, Matysik argues that it is precisely Spinozism that sets limits on Marxist thought whenever the latter imagines humans as different or separate from nature or its other parts.[30] Nevertheless, Marx's position that human beings are part of nature brings

[28] That is why communism, operating as the negation of the negation in Hegelian terms, represents 'the positive transcendence [Aufhebung] of private property'. See Marx 1968, pp. 536-538; 1988, pp. 102-104.

[29] Fischbach on young Marx: 'For humanity there is no individual relationship to nature: *every human relation to nature is a social relationship*' (emphasis added). See Fischbach 2023, p. 49.

[30] Matysik writes about "humans' intrinsic embeddedness in the material world." See Matysik 2022, pp. 10, 226. As Fischbach observes, Marx is strongly influenced by Spinoza's position that humanity is embedded within the natural order. See Fischbach 2023, p. 22.

us, *de facto*, closer to Spinoza, who places human agency, and therefore societies, necessarily within the natural order [ordo].[31] The metaphysical doctrine that humans, like all singular things, must first be conceived as modes of the *one* substance, asserts the modal existence as always already embedded and determined. From this perspective, many contemporary scholars argue that Marxist ecological thought is more consistent with a monistic framework.[32]

Driven by the aforementioned position regarding the Spinozist limits, we will highlight two of them. The first limit concerns the ontological priority of God or Nature [Deus sive Natura] over the modes. From this 'vertical' perspective, when we consider the unity of nature and society, we are not dealing with an equal relation, but one characterised by a strong and a weak pole. The primacy of God establishes the superiority of the laws of nature over any kind of human law. According to the *Short Treatise*, modes are said to 'act' or to be effective only insofar as they abide by the universal natural laws. Whether understood as the one substance or as the infinite 'face of the whole universe' [facies totius universi], nature is regarded as more powerful than singular things. Therefore, it follows that if particular laws are articulated against the natural laws, they will necessarily fail.[33]

The second limit concerns the fact that modes constitute entities that are not self-existent but are necessarily formed together within an infinite causal and relational nexus. From this 'horizontal' perspective, the idea that humans or societies can exist or be conceived independently of other parts of the causal network is largely imaginary. According to the *Ethics*, the priority of the modal overdetermination dictates that modes are able to increase their power of acting [potentia agendi] only insofar as they adequately align with each other.[34]

[31] As Spinoza argues, humans' power 'is part of God or Nature's infinite power'. See Spinoza 1985, pp. 548-549.

[32] Matysik highlights the relation of young Marx with Spinozist monism through Bruno Bauer. See Matysik 2022, pp. 103-107. Malm argues for a substance monism-property dualism framework (society and nature have distinct properties, sharing the same substance), although, strangely enough, he doesn't mention Spinoza at all. See Malm 2018, p. 41.

[33] Sangiacomo and Nachtomy emphasise the importance of the system of natural laws as an insurmountable limit on the activity of finite things. See Sangiacomo & Nachtomy 2018, pp. 108-109; Spinoza 1985, pp. 142-145.

[34] According to Williams, this is precisely the practical outcome of Spinoza's philosophy: our increasing degrees of autonomy through our shared power. See Williams 2019, pp. 118, 125; Spinoza 1985, pp. 555-556.

Thus, if nature is seen as a concrete mode (let us call it 'the planet', 'an ecosystem', 'a forest' etc.), then society can rise to a higher level only to the extent that it is in agreement with nature and in minimal conflict with it. Marx seems to understand the horizontal limit quite well, though he pays less attention to the vertical. *Society, or, later, the ensemble of social relations, always remains the decisive factor for all the other relational types*.[35]

7. *Conclusion*

By highlighting the importance of the social dynamics in fostering a new collective activity and consciousness, Marx ultimately stresses the crucial role of a sustainable relationship between communities and the natural world. Marx's 'monistic' analysis in the *Manuscripts* (in terms of interdependence) shows not only his early ecological inclination but also his action-oriented and practical ecosophical outlook. If social ecosophy consists in 'developing specific practices that will modify and reinvent the ways in which we live' through an 'ethico-political articulation',[36] we contend that the young Marx reveals a deep understanding of humanity's responsibility towards nature as a whole.

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[35] Specifically, we are referring to the sixth thesis on Feuerbach. See Marx 2000, p. 172.

[36] Guattari 2000, pp. 28, 34.

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Energy and Value: towards a Materialist Phenomenology of Nature

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Abstract

In this paper, I propose a possible line of fruitful dialogue between Marxism and Heideggerian Phenomenology by advancing a materialist grounding of the fundamental mode of appearance of Nature in the modern epoch. I do so by taking a central physical concept, Energy, as my guiding thread and using a simple stone as an example. Following Heidegger, I interpret the concept of energy as disclosing the essence of what Nature, as calculable, has come to mean for us. After pointing out some structural parallelisms between Energy and Value, I point to some material conditions for the specifically modern, mathematical way of appearance of Nature. Finally, I indicate a possible extension of this materialist reading to the whole History of Being as presented by Heidegger, and add some disclaimers against any rushed dismissal of energy as a concept.

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Keywords: Heidegger, Marx, Nature, Energy, Value

1. *Introduction*

In this talk,[1] I provide an argument that brings together Physics, Heidegger, and Marxist perspectives. More specifically I will try to highlight the connections between the concepts of energy and economic value, and to point to a deep connection between our mode of production and our understanding of what it means for things to be. Heidegger, as the philosopher who thought the historicity of Being in depth, provides the topic of this talk, i.e. the Mathematization of Nature[2] with energy at its core. Marx, as the thinker who located the material bases to the superstructural phenomena of society, singles out the reference point in terms of which our topic is to be understood.

To make this talk concrete and more understandable, I will use an example of a natural entity, let's say a stone. Immediately, a stone has a set of properties which distinguish it from other things. It has a color, let's say it is grey. It is hard to the touch. It has a shape, and it is made from a certain material. It is heavy when I try to lift it. It can be used to build a house or a windmill.

These were, traditionally, some of the properties that belonged to the stone itself without further ado. In modern times, however, all these qualities have come to be termed 'subjective'.[3] Its color is relative to my senses, so is its hardness. That it can be used to build a house is totally extrinsic to its being, for it only refers to my possibilities as a builder.

[1] I have decided to keep the format of the paper as a talk, merely adding a bit of structure and some footnotes with bibliography and clarifications wherever I saw the need.

[2] The Mathematization of Nature was an important topic of interest for the classical figures of Phenomenology, Husserl and Heidegger. Husserl develops it in his Crisis of the European Sciences (Husserl 1984), and Heidegger first mentions his own conception, the Mathematical Project of Nature, in Being and Time §69 (Heidegger 1996), but develops it in detail in his Question Concerning the Thing (Heidegger 2018). The fundamental aspect to be kept in mind is that, in the context of Phenomenology, Mathematization does not mean merely the external application of mathematical tools to the study of an invariant object. On the contrary, it is the object itself, Nature, and its being, which began to appear as purely mathematical since the inception of modern science (Galileo and Descartes). Any methodological priority of mathematical tools in science (as modern physics perfectly illustrates) is merely a consequence of the prior ontological mathematization.

[3] I am referring to the famous distinction between primary and secondary qualities introduced by Galileo.

What, then, has today become the true, objective being of the stone?[4] What is the stone in reality? According to Heidegger, the real stone is disclosed in the sciences.[5] The most fundamental of the natural sciences is physics. Thus, we will find the most fundamental characteristics of the stone as it really is, in its physical analysis.

2. *Phenomenology of Modern Physics: Energy*

The stone is really a distribution of matter, which evolves according to universal and mathematical natural laws through space and time.[6] In this, all theories of modern physics agree. Whether that distribution of matter is composed of atoms, particles or field excitations, whether the laws are those of Newton or of Maxwell, whether space and time are absolute or relative, flat or curved, is accidental to this essential characterization.

Which are the aspects of the stone that figure here? Those which are mathematizable. Modern physics is essentially the articulation of phenomena through mathematical relations. Thus, it is only sensitive to that which can be assigned a numerical value, which coincides with what is quantitatively measurable, whether mediately or immediately.

Something that Phenomenologists did not explicitly remark is that, out of all the quantities that characterize the modern being of the stone, such as its distribution of mass, its charge, its position or its momentum, one is special: energy. Energy, at least in the classical realm of physics (I won't dive into the intricacies of the contemporary theories to make this talk manageable), is a universal quantity that all natural things possess.

Not only that, but in all natural processes, energy is conserved, and this is grounded on a very profound principle at the basis of our understanding. It is conserved in that, throughout natural evolution, it

[4] Following the Heideggerian approach, we are not asking for the being of the stone as each one determines it to be (just in one philosophy department we would already be at a loss among an irreducible plurality of interpretations), but the being of the stone as the average and paradigmatic way in which it appears to us in the West today.

[5] "Science is no more merely a cultural activity of man than is art. Science is one way, and indeed one decisive way, in which all that is presents itself to us." Heidegger 1977b, p. 156.

[6] This is what Heidegger calls the Mathematical project of Nature: "… the plan or projection of that which must henceforth, for the knowing of nature that is sought after, be nature: the self-contained system of motion of units of mass related spatio-temporally." Heidegger 1977a, p. 119.

merely changes between forms. When I throw the stone upwards, I am transferring energy to it in the form of mechanical work. This energy is transformed into kinetic energy as the stone moves upwards. Throughout its trajectory, this kinetic energy is transformed into potential energy as it rises and slows down, until it reaches the highest point. Here potential energy is again transformed back into kinetic energy as the stone falls back. Finally, the stone hits the ground, transmitting its energy to it in the form of inelastic deformation and residual heat.

All the relevant quantities that constitute the physical description of the stone, that is to say, those that participate one way or another in its evolution, participate in the expression of its energy. Electrical charge appears in electric and magnetic energy, position in potential forms of energy, velocity in kinetic energy. Even mass has an energy equivalent through the famous $E=mc^2$ equation.

I claim that its omni-presence, its universal character, is founded on the fact that energy is an a priori of the mathematization of nature. The subsumption of natural phenomena in terms of universal invariant laws allows us to find an expression whose value at any moment remains constant. I will just mention that it has to do with a mathematical theorem called Noether's theorem. Of course, historically, energy was only identified in the mid-19th century, but it was implicit, more or less completely, in the calculations since the very inception of modern physics.[7]

To summarise: for us moderns, the true being of the stone is its mathematical and objective being as disclosed most fundamentally in physics. This is what Heidegger described in many works. This being implies a universally conserved quantity in all processes. The different mathematical expressions or formulae of this quantity determine the way in which natural processes unfold, as the one we have described with respect to the stone. It determines the proportion in which velocity is transformed into height or deformation and heat during an impact. That is, it lawfully structures all the terms of the interaction in a certain proportion.

[7] For instance, there was already a universally conserved quantity in purely mechanical interactions (what we now call mechanical energy), but it was not recognised as such because, in any real context, mechanical interactions are coupled with thermodynamical, electromagnetic or other kinds of interactions: for instance, mechanical energy is never conserved because a fraction is transformed into heat through the resistance of the components.

Accordingly, in this sense, the modern picture presents a stone which *essentially* is a relatively stable pattern in energy flows.[8] This means that its essence is in fact to be potentially transformable into any other kind of energy through an infinity of possible different processes. I can melt the stone and transform it into a fluid. I can break it and make powder. Even at its most fundamental level, I can transform its mass into radiation, for example if it is made from uranium. In all these changes, not hardness, nor color, nor weight are preserved but only energy.

3. *Energy and Value: a materialist grounding*

As readers of Marx, all that I have been saying must sound familiar. Energy is a universal quantity that only acquires meaning as conserved in transformations throughout physical processes, structuring the proportion in which each of its forms is transformed into each other. It is an a priori idea, one which does not originate in empirical observations even if its concrete functional expressions do: by this I mean that the particular energy expressions of given entities is only determinable empirically, but the fact that there has to be such an expression is a priori. Energy is thus a non-empirical universal equivalent which structures the transformation of natural entities.

Accordingly, energy is the conceptual correlate of economic value in the natural realm. A commodity can only be a commodity, i.e., be exchangeable with a totality of other commodities in certain proportions, if it is an embodiment of value as a transcendental structure. A natural entity can only be, in modernity, a natural entity if it is transformable in certain ways into a plurality of other entities, and this is equivalent to say: if it is an embodiment of energy as a transcendental structure.

I have thus pointed at an isomorphism between energy and value. This can already make us suspicious regarding their relationship. Instead of taking energy as an unproblematic characterization of natural beings, we should inquire into its historical origins.

I said earlier that energy is an a priori of the mathematization of Nature. Thus, the analysis of energy is one with the analysis of this mathematization. In what context did Nature come to be mathema-

[8] Physically speaking, a stone, together with its permanence in time, its hardness, etc., is merely the result of being a stable configuration of continuous binding interactions (transfers of energy) among molecules, atoms, etc.

tized in the first place? Heidegger gives us an indication. He links such a mathematization with a will to control beings. This will is so fundamental that it characterizes not only our concrete actions but even our most basic ontological comprehension. A pioneer in this direction was Descartes, traditionally referred to as the father of modern philosophy, who determined the essence of truth as certainty. The true becomes that of which we can be certain, i.e. what we can secure by controlling it, whether in thought or in practice. Mathematics, as the science in which each step of reasoning follows absolutely certainly from the previous one, such that nothing escapes our oversight at any moment, earns its throne as the ideal for science, as mathesis universalis. What is true is that which we can oversee and control in absolute clarity and distinctness, and true natural knowledge is the one which projects nature mathematically.

Thus, what lies at the basis of this move towards mathematization is an impulse towards certainty, oversight, and mastery. But where is this impulse coming from and why did it extend to become our general standpoint? Heidegger himself gives no scientific or historical explanation.[9] Usually, he either grounds it in a problematic tendency of our (Dasein's) mode of being (in his early works), or in a historical destiny that Being itself has initiated (in his later works).

This is where Marxism is most interesting. We can trace the generalized will to mastery over Nature, with its consequent mathematization, back to the ever-pressing profitability imperative under the capitalist mode of production.[10] Production must always become more efficient, less wasteful, quicker, etc. The only way to always be able to

[9] There are, however, some exceptions (even with some pseudo-materialist remarks): "Concerning the basic principle of motion, the law of inertia, one can ask whether it is not to be subordinated to a still more universal one, the law of the conservation of energy, which on its part is now determined in light of consumption and expenditure, work – names for new basic representations that now penetrate the observation of nature and betray a conspicuous echo of the economic and its "calculation" of the outcome." Heidegger 2018, p. 64.

[10] This is of course a very simplified way of synthesizing it. It does not try to mechanically explain particular events such as Galileo or Descartes' doctrines through the reference to a very underdeveloped capitalist base. Irrespective of individual genius or ideas, what is in need of a structural explanation is why Nature became commonly understood in mathematical terms in a very particular cultural and geographical area consistently throughout centuries. I am thinking along the lines of Joseph Needham here.

do so is to master the natural processes in a way which can always be rendered more precise, that can always improve. The only knowledge and language that allows for a such an unlimited improvement in precision is mathematics.[11]

Thus, the profitability imperative, although it can be at first fulfilled within the progressive specialization of artisans and their tacit and practical knowledge, soon imposes the establishment of mathematical control over processes with its corresponding army of scientists and engineers. This is the rationalization of production characteristic of modernity, which is of course a rationalization in a very narrow mathematical sense.

Energy plays a central role in this picture. As the constant in all processes, it provides the substance of our mastery over nature. If I know a way to transform or stock the energy of my surroundings in an easily conservable medium such as oil or an easily transportable one such as electricity, I can technically use this energy for *any* process that I require in production. Thus, it is energy's universal constancy that grounds its interest from the standpoint of the mastery of natural processes. The same goes for the role of value in commerce. Value is interesting from the standpoint of capitalists because it is that which is universally constant, at least approximately, in commodities, and thus that which can be accumulated. When faced with complex productive processes and confronted with the problem of maximizing profitability, the capitalist will need to measure and keep track of prices; when confronted with complex material processes and confronted with the problem of improving an engine or a power plant, the engineer will need to measure and keep track of energy.

4. *Abstraction*

Lastly, I want to highlight another essential characteristic of energy that serves to relate Heidegger and Marx. Energy is not just mastery over Nature, but specifically *abstract* mastery over nature. By this, I mean to express the fact that *any* form of energy can, in principle, be transformed into *any other* kind, and that energy is the same sub-

[11] We can think of the Husserlian determination of mathematical entities as constituted by a passage to the limit as developed in his *Origin of Geometry,* an annex of his *Crisis* (Husserl 1984).

stance in all its forms. When I accumulate energy, I am not accumulating the power to do *this* or *that* particular thing, but to do in principle *anything*.

This is where Heidegger situates the abyss between ancient and modern technology in his *Question concerning technology*. Ancient technology is oriented towards concrete goals and brought to light within concrete situations, which allowed for a plurality of considerations and ends to guide our actions. On the contrary, modern technology is oriented towards the goal of abstract domination (which Heidegger rightly determines as ultimately meaningless). It is developed within the situationless/universal realm of scientific theory, which only allows for the mathematical criteria of precision and efficiency. Of course, this ontological distinction fits precisely with the distinction between the ancient societies which had at most a C-M-C form of circulation where production was mainly geared towards use-values (to solve concrete needs) and the modern capitalist society with its M-C-M' form of circulation where production is geared towards value (to sell commodities). In a society where production is geared towards a global market in which all kinds of processes anywhere need to be interlinked in a precise and efficient manner, a measure of abstract conserved power that is independent of place and time imposes itself.[12]

However, in keeping with Heidegger's insights, energy is not just a useful quantity among others, which we could dispense with. As I mentioned when I started my text, energy condenses what nature *is* for us, what the stone truly *is* (phenomenologically speaking). Thus, just as a materialist reading of Heidegger is needed if we are to ground the deeper philosophical tendencies that he describes, a phenomenological-ontological reading of the Marxist standpoint is needed if we are to correctly grasp the full extension and impact of his theories.

5. *A possibility for dialogue*

In fact, as Heidegger himself points out in his *Letter on Humanism*, a possible fruitful dialogue can be established with Marx because he offers a sufficiently deep historical understanding of the way in

[12] This path is similar to Sohn-Rethel's attempts at materially grounding Kant's Categories. However, the topic of interest is different, and he doesn't mention energy.

which we meaningfully relate to other beings and each other[13]. I will just quickly point at some possible paths for such a dialogue. Greatly simplifying, both Marx and Heidegger distinguish three main epochs in the history of the West in the economical and phenomenological-ontological planes respectively.[14] Both accounts of these epochs not only coincide in time but are essentially related to each other. From a marxist perspective, this relation could be framed in terms of base and superstructure.

The Greek world with its slave mode of production is the birthplace of theoretical knowledge. This, essentially, is knowledge acquired once we stop practically and productively engaging with beings, as Heidegger explains in *Being and Time.*[15] It was the aristocrats discharged from the denigrated manual work that first laid the grounds of philosophical thought. Accordingly, the first general determination of Being is, unsurprisingly, related to passive observation as opposed to manual activity: the Greek words for seeing, *ideein* and *theorein*, give rise to the Ideas and to Theory. The Middle Ages with their tripartite feudal mode of production are intellectually led by the Church and give rise to a theological determination of Being which orbits around a core creator. In Modernity, this ontological core is transferred to the subject with mathematics as its instrument, and beings are determined as representations and means for the will to become certain.

The Question of Being is implicitly posed and fought out within the realm of Theory, Theology and Epistemology in each respective epoch. The connections between the dominant understanding of Being and the form of class rule are manifold, irreducible to any mechanistic conditioning, and different in each epoch, but they are still there. This dialogue of course opens many problems, for example, regarding the status of modern mathematical science. Is it merely a

[13] "Because Marx by experiencing estrangement attains an essential dimension of history, the Marxist view of history is superior to that of other historical accounts. But since neither Husserl nor – so far as I have seen till now – Sartre recognizes the essential importance of the historical in being, neither phenomenology nor existentialism enters that dimension within which a productive dialogue with Marxism first becomes possible." Heidegger 1998, p. 259.

[14] Heidegger is less interested in giving a final doctrinal classification of epochs than in understanding the general process and the different discontinuities, which is why the number and kinds change from text to text.

[15] Heidegger 1996.

historical mode of knowledge grounded in a certain mode of production? What could possibly ever replace it? We can only pose these questions for now.

6. *Concluding Remarks*

One last question with which I want to finish this talk is the one concerning the role of energy in the possible transition to a communist society. If energy is capitalist in origin and essence, should we do away with it in the transition to socialism? Should we stop talking about energy in general?

Both questions should be answered negatively. In its early stages, especially in the context of ecological catastrophe and struggle against capitalist countries, any revolutionary society not only can but *must* make energy one of its central concerns. Energy should be optimized and controlled, although socially and consciously instead of individually and irrationally. Energy as a tool for natural mastery is essential to oversee and harmonize the different branches of production and to strengthen the solidity of a society against the natural and geopolitical adversities. Communism is indeed, at least initially, "Soviet power plus electrification of the whole country"[16]. In fact, energy provides the perfect framework for a defense of socialism and a critique of capitalism as a system characterized by an enormous waste and an unequal and irrational use of energy.

What the insight that I have presented does imply, on the contrary, is that only in the context of a transition to communism will it be fully possible to fundamentally alter our paradigmatic understanding of nature and our relation to it in a way which transcends the narrow and abstract mathematization that presents each thing as a mere disposable resource to be exploited. Only then can the stone become once again a possible medium for the meaningful and recover its intrinsic value. As the stone, so the river, the animal, the valley, and the sun. The question of whether the essence of nature will ever be for us something beyond energy, beyond its mathematical aspect, is linked to the question of whether we will ever be able to dispense with a mode of production which is mathematically regulated. The question is, as Marx put it, whether we will ever be able to cross the

[16] Lenin 1965, p. 418.

"narrow horizon of bourgeois right"[17] in its entirety and found a society in entirely new principles. Only a social revolution enables an ontological one.

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[17] Marx 1970.

From Science to Metaphysics
The notion of Metabolism in Moleschott's Materialism

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Abstract

In recent years, the concept of metabolism has become central to Marxist scholarship on account of its ecological insight into the rift between processes of value production and the dynamics of nature. This paper contributes to this debate by reconstructing part of the scientific and philosophical context in which Marx developed his understanding of the metabolic relationship between society and nature. It focuses on the pivotal role of metabolism within nineteenth-century German scientific materialism, the so-called "vulgar materialism" later criticized by Marx and Engels, particularly the theoretical contribution of Jacob Moleschott. I argue that Moleschott's notion of metabolism not only designates the network of material and energetic exchanges in nature, but it also functions as a polemical instrument, revealing an ontological and even metaphysical character. In this light, I show how Moleschott's materialism remains indebted to the *Naturphilosophie* of the young Schelling, taking shape as a kind of "religion of matter" or, at any rate, as a circular and romantic conception of nature. The paper concludes by suggesting that this deterministic and speculative materialism helps us contrastively illuminate the specificity of Marx's own conception of metabolism.

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Keywords: Materialism, Metabolism, Nature, Natural Sciences, Philosophy of Nature, Social Mediation

1. *Introduction: metabolism and scientific materialism in nineteenth-century Germany*

Since the early decades of the nineteenth century, the concept of "*metabolism*" – "*Stoffwechsel*", or more rarely "*Metabolismus*"[1] – has played a central role in the development of the natural sciences in Germany. Within this emerging epistemic landscape, the term designates the network of material and energetic exchanges which are essential to the self-preservation of living beings, while also describing the dynamic processes of interaction between biological organisms and their environment[2]. Far from being a merely descriptive notion, *metabolism* functions as a theoretical and methodological device through which the unity of life and matter could be recast in new and profoundly materialistic terms. In Justus von Liebig's chemistry, the concept identifies the circulation of substances between the plant and animal kingdoms, providing a chemical foundation for conceptualizing the continuity of organic processes[3]. In Liebig's physiological research, the concept of *Stoffwechsel* refers to the chemical processes of transformation and conversion that undergird the growth, maintenance, and decay of living beings[4]. This idea also proves crucial to cell biology – especially after Schleiden and Schwann's discoveries that cells constitute the elementary *morphological unit* of all living beings – wherein metabolism came to signify the specific kind of exchanges occurring at the cellular level[5]. Finally, in thermodynamics, metabolism is directly related to the principles of energy transformation within systems, binding organic processes to the universal laws of matter and motion[6].

Stretching across all these different domains, the concept of metabolism marked not only a decisive moment in the scientific understanding of life but also a shift in the philosophical conceptualization

[1] For instance, in his Microscopical Researches Theodor Schwann (1847, p. 193) employs the term "Metabolismus", modelled on the Greek term tò metabolikòn ("that which is liable to occasion or to suffer change"): "These phenomena may be arranged in two natural groups [...] which may be called metabolic phenomena". See also Nail 2020, pp. 100-106.

[2] See Foster 2000, p. 160.

[3] Liebig 1840.

[4] Liebig 1842.

[5] See Jessop 2019.

[6] See Foster & Burkett 2016.

of nature, emphasizing its dynamic, relational, and historical character. Alongside this new, profoundly anti-teleological conception of nature, a deep transformation also took place in the very image of the machines. The nineteenth-century machine was no longer powered by an external source, but by an internal motor transmitting energy through a chain that extended outward from a central core. As Anson Rabinbach evocatively observed, "the body, the steam engine, and the cosmos were thus connected by a single and unbroken chain of energy"[7].

Beyond their practical and thus political significance, these technological transformations were closely intertwined with the same scientific discoveries that conceived nature as the *circulation of matter and energy in constant transformation*. For many physicians, scientists, and intellectuals of that time, the implications of the natural sciences pointed toward the necessity of defending a radically materialist understanding of the universe. In other words, the popularization of science became inseparable from the struggle to affirm a materialist conception of nature, science, society, and the human being itself[8]. It is in this cultural context that figures such as Carl Vogt, Ludwig Büchner, Jacob Moleschott, and Heinrich Czolbe extended the concept of *metabolism* beyond the strictly scientific domains of chemistry and physiology, redefining it as a polemical and philosophical instrument central to nineteenth-century *scientific materialism*[9].

In the work of these authors, the principle of the inseparability of matter and energy assumes an epistemological, ontological, and even political significance. At the core of Ludwig Büchner's influential *Kraft und Stoff* (*Force and Matter*, 1864 [1855]), the indissoluble unity of matter and energy functions as a polemical critique of any transcendent or dualistic principle. By grounding all natural processes onto the eternal circularity of matter, Büchner articulates a thoroughly immanent worldview in which the self-organising power of nature replaces divine impulse as the driving force in nature. This materialist ontology unfolds both as a negation of metaphysical doctrines concerning God and the immortality of the soul and as a secularization

[7] Rabinbach 1990, p. 52.

[8] On the popularization strategy within the Nineteenth-Century materialism see Bayertz 1985.

[9] For a comprehensive reconstruction of the so-called Materialism Controversy (Materialismusstreit), see Bayertz et al. 2007; Pecere 2024; Gregory 1977.

of scientific reason[10]. As Moleschott writes: "Force is not a God that gives impulse [to things], nor an essence separated from the material foundation of things, but a property inseparable from matter, inherent in it from eternity"[11]. Hence, the inner causes and living forces operating within natural entities cannot be derived from any transcendent principle.

Within this framework, the notion of *Stoffwechsel* plays a crucial role. Chemical investigations into the metabolic exchanges between the organic and inorganic realms provided an empirical ground for the critique of religion, vitalism, and spiritualism in general. In other words, the incessant formation, dissolution, and recomposition of substances exemplified the autonomous and dynamic character of matter – a *perpetual metamorphosis* that does away with external or supernatural agents.

> Matter is immortal, indestructible [*Der Stoff ist unsterblich, unvernichtbar*]. There is not an atom in the universe which can be lost. We cannot, even in thought, remove or add an atom without admitting that the world would thereby be disturbed, and the laws of gravitation and the equilibrium of matter interfered with. It is the great merit of modern chemistry to have proved in the most convincing manner that the uninterrupted change of matter which we daily witness, the origin and decay of organic and inorganic forms and tissues, do not arise, as was hitherto believed, from new materials, but that this change consists in nothing else but *the constant and continuous metamorphosis of the same elementary principles* [*der beständigen und unausgesetzten Metamorphosirung derselben Grundstoffe*], the quantity and quality of which ever is, and ever remains, the same[12].

Building on the biochemical and physiological investigations of his time, Büchner could thus affirm that "we change so rapidly that we may be said, after the lapse of four weeks, to be different and new beings; the atoms are exchanged, but the mode of their combination remains the same"[13]. Physiological and scientific materialism extends this logic to the human being itself, insisting on its full inclusion within the material continuum of nature and rejecting any attempt

[10] See Pecere 2024.
[11] Moleschott 1852, p. 323.
[12] Büchner 1864, pp. 9-10.
[13] Büchner 1864, p. 11.

to locate a spiritual essence or immaterial core within it. Against the "aristocracy of the spirit", understood as the supposed unifying principle of human nature, Büchner advances a radical demystification: the human being is no longer the image of a divine order, but rather a provisional constellation of matter or, as Engels put it a "federation of cell-states [*eine Föderation von Zellenstaaten*]"[14].

2. *From science to metaphysics: Moleschott on metabolism*

As we have seen, for the nineteenth-century German materialists the concept of metabolic exchange was no mere physiological mechanism; it was the very *principle governing the balance of the universe*. More explicitly than in Büchner, the notion of *Stoffwechsel* assumes a central scientific and ontological role in the work of Jacob Moleschott[15].

Already in the winter semester of 1850-51, the Dutch physician delivered a course on *Physiology and Metabolism* (*Physiologie und Stoffwechsel*) in Heidelberg. These lectures would form both the core of Moleschott's *Physiology of Metabolism in Plants and Animals* (*Physiologie des Stoffwechsels in Pflanzen und Thieren, 1851*) and the foundation for his more widely known *The Circulation or Cycle of Life* (*Der Kreislauf des Lebens*, 1852). In this latter work, Moleschott sought not only to disseminate recent advances in physiology but also to articulate them within a coherent materialist and organicist worldview[16]. For him, the popularization of science is inseparable from the advancement of a materialist conception of nature, morality, and religion in philosophy.

Yet, Moleschott's scientific materialism does not arise solely from empirical findings in natural sciences. It is also influenced by several intellectual traditions, including Schelling's philosophy of Nature, modern materialism, and notably Feuerbach's "anthropological materialism"[17], with which Moleschott engaged in a productive and mutual exchange after 1848. In his *Doctrine of Nutrition*, Moleschott provocatively declared – echoing Cabanis and the French material-

[14] Engels 1987, p. 14 [MEGA² I/27, p. 497].

[15] For a broad overview on Moleschott's theoretical biography, see Meneghello 2017; Cosmacini 2005.

[16] See Meneghello 2017, pp. 113-139.

[17] See Schmidt 1973.

ists of the eighteenth century – that there is "no thought without phosphorus"[18], a claim that would inspire Feuerbach's famous dictum: "Der Mensch ist, was er isst"[19].

Der Kreislauf des Lebens (*The Circulation of Life*) – composed as a series of twenty letters – was conceived as a critical response to Liebig's *Chemische Briefe* (*Chemical Letters*)[20]. Moleschott does not, however, reject Liebig's scientific contributions; on the contrary, he fully acknowledges that he provided conceptual and experimental *tools* for grasping the material structure of the exchange between organic and inorganic nature. Rather, his critique is directed at Liebig's reference to "causes which must be called providential"[21]; a gesture that reveals a lingering spiritualism. In Moleschott's eyes, Liebig appears as a Janus-faced figure: the chemist of *Stoffwechsel*, whose discoveries had opened the way for a secular, immanent understanding of nature, and the theologian of providence, who sought to reconcile the empirical knowledge of nature with the transcendent truth of Christian doctrine[22].

However, the main target of Moleschott's critique is Liebig's invocation of *Lebenskraft* – the "vital force". In the opening letter of *The Circulation of Life*, he writes: "Whoever speaks of a vital force [*Lebenskraft*], of a typical force, or whatever else one prefers to call it, must assume a force without matter"[23]. To posit such an entity, for Moleschott, means to assert the existence of an invisible and indeterminate principle capable of acting upon matter without itself belonging to it. His argument recalls the early Schelling's philosophy of nature, where *Lebenskraft* was already dismissed as an "expression which merely conveys the hope of making that principle act according to physical law"[24]. For Moleschott, this is not simply a philosophical mistake; it betrays epistemological confusion. The experimental syn-

[18] Moleschott 1850, p. 120.
[19] Feuerbach 1982, pp. 196-197.
[20] Liebig 1878.
[21] Liebig 1878, p. 353.
[22] "In this lies the high value and sublimity of the knowledge of nature: that it mediates true Christianity. Here resides the divine origin of Christian doctrine, which owes the possession of its truths and its correct conception of a being exalted above all worlds not to the human path of empirical inquiry, but to higher illumination" (Liebig 1878, p. 24).
[23] Moleschott 1852, p. 347.
[24] Schelling 1994, pp. 102-103.

thesis of physics, chemistry, and physiology left no room for any "vital force." In its place, Moleschott posits a fully material physiology: a general science of nature capable of grasping the unity of matter and energy as a continuous field of transformation.

Even the problem of life's origin, for Moleschott, is subsumed under the continuous metabolic circulation of matter, in which life itself emerges as matter's own mode of self-transformation:

> The only fundamental difference between organic and inorganic matter consists in this: that organic matter possesses a much more complex composition. […] The maintenance of this state of composition through the *continuous exchange of matter* [*bei fortwährendem Wechsel der Stoffe*] characterizes the life of the individual[25].

Within this framework, life and death emerge as the two poles of a single, continuous *metabolic interchange*. Already in the *Physiologie des Stoffwechsels*, Moleschott had claimed that "life itself can be understood only through metabolism [*aus dem Stoffwechsel*]," and that, consequently, "the doctrine of metabolism [*Lehre vom Stoffwechsel*] possesses a significance that extends far beyond life itself"[26]. In *The Circulation of Life*, this concept becomes "the axis around which the wisdom of the present world turns"[27]. Metabolism, therefore, is not only a heuristic tool for empirical investigation, but also the key principle of a broader "conception of nature" as a "process of circulation", an idea that once again recalls the *Naturphilosophie* of the young Schelling[28]. According to Schelling, nature – understood as the totality of beings – appears as a kind of "universal organization," defined by an infinite "productivity" that perpetually absorbs its own products within a relentless movement of circulation[29].

A similar ontological tension seems to inform Moleschott's own deployment of the concept of metabolism. In this light, the *Third letter* of his *Circulation*, devoted to the eternity of matter, clarifies the ontological and metaphysical meaning of *Stoffwechsel*:

[25] Moleschott 1852, pp. 347-348.
[26] Moleschott 1851, p. 14.
[27] Moleschott 1852, p. 363.
[28] See Schmidt 2014, p. 76.
[29] Schelling 2000.

> What man excretes nourishes the plant. The plant changes the air into solids and nourishes the animal. Carnivorous animals live on herbivorous animals, to fall victim to death themselves and so spread abroad newly germinating life in the plant world. The name "metabolism" [*Stoffwechsel*] has been given to this exchange of material. One rightly utters the word not without a feeling of reverence [*ein Gefühl der Verehrung*]. For just as trade is the soul of exchange [*der Verkehr*], so the eternal circulation of matter [*das ewige Kreisen des Stoffs*] is the soul of the world [*die Seele der Welt*][30].

The never-ending metamorphosis of matter enables us to conceive of nature as a universal organism, a self-transforming totality in which generation and dissolution form a continuous circle. From this perspective, an ontological order emerges in which the concept of material interchange operates on multiple levels: it describes the natural cycles of matter while also expressing the *law that governs their recurrence and balance*. In this sense, therefore, the physician can refer to the *Stoffwechsel* as the *"soul of the world"* [*die Seele der Welt*]. This expression further attests to Moleschott's intellectual debt to Schelling – who, drawing upon the ancient philosophical tradition, had developed the notion of a *World Soul* [*Weltseele*] as the "*organizing principle* that gives the world the form of the *system*"[31]. The concept of *metabolism* emerges as precisely such a unifying principle of nature. In this way, Moleschott on the one hand interprets some elements of Schelling's philosophy of nature through a materialist lens; on the other, he translates his materialism into a "sacralizing conception of nature"[32]. This results in a philosophical perspective on nature in which the more scientistic and reductionist tendencies of a strictly physiological materialism are deeply intertwined with metaphysical, if not religious, motifs. *Stoffwechsel* becomes a holy word that evokes a sense of reverence ["*ein Gefühl der Verehrung*"]. In this "religion of matter," metabolism is both the process through which life circulates and maintains its balance within the flux of matter and energy, and the *very subject of that process* or the *world soul itself*, both *presupposition* and *product*, the *agent* and the *object* of its own self-transformation.

[30] Moleschott 1852, p. 41. On this quotation see also Schmidt 2014, pp. 75-76.
[31] Schelling 2000, p. 77.
[32] Cosmacini 2005, p. 85.

3. *Politics of metabolism*

The notion of metabolism also plays a crucial role in Moleschott's political and social analysis. The emphasis he places on the principles of dietetics and nutrition translates, at the political level, into a demand for a fairer and more rational access to food resources for the working class[33]. The metabolism of the proletariat thus becomes a central political question.

As we have already observed, Moleschott develops an analogy between metabolism and economy. The metabolic processes of matter are the unifying principle of reality, just as commerce is the dynamic core of economic exchange and circulation. An extension of the concept of metabolism into the semantic field of economy and circulation had already been proposed by Liebig in a passage from his *Chemical Letters*, which Moleschott himself quotes. "In the organism of the State," writes Liebig, "silver and gold have assumed the role of blood corpuscles in the human organism; just as these round discs […] are the mediators of metabolism […] so money has become the mediator of all activity in the life of the State"[34]. But while for Liebig the analogy between metabolism and money ultimately reaffirms an organicist and conservative vision of the State, for Moleschott it takes on a distinctly socialist trajectory. The study of social metabolism, he states, may benefit from the "socialist understanding of social need"[35].

This political tension does not, however, clear the way for political *action* on the part of the organized proletariat. Instead, the doctrine of metabolism is presented as already endowed with an immediate transformatory and emancipatory potential. From this perspective, materialist science becomes the paradigm for both social analysis and political practice. The full development of this universal science of the organism would, in Moleschott's view, resolve the antagonistic conflicts at the heart of modern bourgeois and capitalist society, thereby avoiding the need to open the political question of the constitution of a specific class-subject.

[33] Meneghello 2017, p. 63.
[34] Liebig 1878, p. 355.
[35] Moleschott 1852, p. 442.

The reductionist dimension of Moleschott's thought, together with its theological, metaphysical, and romantic core, undoubtedly inspired Marx's critique[36]. As Sebastiano Timpanaro observes, scientific materialism was certainly less philosophically refined than Feuerbach's humanistic naturalism. At the same time, however, it was more deeply grounded in the contemporary advances of the natural sciences. "The claim of the new materialism was to explain even this active side in scientific terms, i.e. as a complex of material processes obeying certain laws"[37]. What is at stake here is not merely the elaboration of a concept of nature that accounts for the historically mediated forms of human labour, but also a more precise understanding of the development of the natural sciences themselves and their subsumption under the logic of capital's self-valorization. In other words, Marx and Engels set out to contest the most mystifying and metaphysical aspects of Moleschott's materialism; they also engaged with the new theoretical and political conditions produced by the advance of modern science.

Similar considerations apply to Moleschott's conception of *Stoffwechsel*. With it, Moleschott sought to posit a continuity between natural and social systems, albeit in a deterministic and reductive way. Yet this perspective fails to grasp the extent to which the social organization of labour and the norms governing social reproduction actively shape the very form of metabolic exchange between human beings and nature, as it is shown in the case of the metabolic rift analysis in volumes I and III of *Capital*[38].

It is worth noting that Marx explicitly refers to Moleschott's notion of Stoffwechsel only once, and only incidentally. In a letter to his wife Jenny, Marx writes: "But love, not for Feuerbachian Man, not for Moleschottian metabolism [*nicht zum Moleschotten Stoffwechsel*], not for the proletariat, but love for a sweetheart and notably for yourself, turns a man back into a man again"[39]. Aside from these passing references, however, what is most striking in Marx's letter is the polemical

[36] On the relationship between Marx and Moleschott, see Mitchell 1977; Saito 2017, pp. 79-85; Schmidt 2014, pp. 74-81; Raimondi 2022, pp. 219-225.

[37] Timpanaro 1980, pp. 81-82.

[38] Marx 2010a, pp. 505-507; 1998, p. 799. For an extensive discussion of Marx's notion of "metabolism" and of the so-called "metabolic rift," see Saito 2017; Foster & Burkett 2016; Foster 2000; Nail 2020; Schmidt 2014; Murrone 2022; Mau 2023, pp. 104-119; Pawelzig 1997.

[39] Marx 1983, p. 55.

juxtaposition of the Moleschott and Feuerbach[40]. This pairing is far from accidental. In the aftermath of the 1848 revolutions, Feuerbach's materialism became increasingly attuned to the advances in the natural sciences and, more generally, to the emerging voices of scientific materialism. Conversely, Moleschott's organic materialism culminated in a new religion of nature and human beings, explicitly indebted to Feuerbach's earlier humanism.

A philosophical continuity thus links the abstract Feuerbachian conception of the human – which Marx described as "an inner, mute, general character which unites the many individuals only in a natural way"[41] – to Moleschott's effort to translate the physiological constitution of the human species into the scientific foundation of a materialist politics. Marx's polemic, therefore, is aimed not so much at the opposition as atthe deep complicity between these two forms of materialism – both of which fail to grasp the specific mediation of society and nature, that is, to conceive of materiality as irreducibly dialectical, at once natural, historical, and social.

4. *Conclusion*

The concept of metabolism thus proves to be a prime scientific and philosophical source for the new kind of materialism that Marx sought to develop. In Moleschott's work the concept of metabolism takes on a *distinctly metaphysical dimension*. In continuity with the philosophy of nature of the young Schelling, metabolic exchange emerges as a *principle of unification* for the whole of nature, laying the groundwork for what we may call a new *religion of matter*. The overall framework combines a strict physicalist materialism with a persistent tendency to *romanticize nature*.

Against this background, Marx's notion of metabolism can be seen, at least in part, as a critical response to the one-sided conception advanced by such nineteenth-century champions of scientific materialism as Moleschott. For Marx, the concept of metabolism, central to the intellectual and scientific life of his time, highlights the material co-evolution of nature and society, while also defining a key scientific and political problem: that of governing natural imbalances and, most

[40] Raimondi 2022, p. 224.
[41] Marx 2010b, p. 4.

importantly, the so-called "*metabolic rift*" stimulated by the capitalistic mode of production. Finally, in contrast with Moleschott, Marx understands metabolism as historically determined, that is, shaped by the interplay of successive historical and temporal layers. Metabolic questions, therefore, point back to the constitution of capital itself as a *form of mediation*, one that both presupposes and reproduces its own domination, but also continuously generates the possibility of proletarian resistance and collective struggle. A different configuration of the social metabolism with nature would thus require liberation from the rule of value, opening the way to a scientific and political governance of necessity and of the most destructive and disharmonious dimensions of nature.

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Marx Maligned, Marx Promethean, Marx contra Engels

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Abstract

Marx has been not only much maligned, but also much misunderstood and misrepresented. The debate about Marx in relation to ecological questions usually concerns Marx's later writings and in unpublished notebooks that fell into the hands of Engels. As our contemporary society begins to understand the cataclysmic change human activity has upon the world, how important is it to uncover an ecological Marx? Can one be a Marxist, a socialist, or an anti-capitalist and develop an ecological critique of the present without having to legitimize that critique through Marx's authority? In *Marx in the Anthropocene: Towards the Idea of Degrowth Communism*, a book that seeks to develop an understanding of the ecologic Marx, we may ask how convincing author Kohei Saito's claim to have discovered a post-1868 ecological turn in Marx's thinking. Do these later works overcome criticisms of Promethean worldviews often associated with Marx? To what extent is Saito's book primarily a work of Marxology?

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Keywords: Saitō, Engels, Marxology, Prometheanism, Degrowth Communism

Undoubtedly the work of highest impact that Marx gave to the world was *Capital*. This is quantified however with the caveat that he only personally oversaw the publication of its first volume in 1867. He would go on to spend a large amount of time working on the French translation of this work, as well as subsequent editions of volume 1 where Marx spent a large amount of effort expanding on foot-

notes and reworking sections. *Capital* at one point was envisioned as at least a six-volume work that was to be a sweeping epic describing, and no doubt excoriating, the machinations and whims of how capital has overtaken the world. Those with some knowledge of Marx will know that it was indeed only volume 1 that was personally overseen by Marx. His longtime friend, collaborator, and benefactor Friedrich Engels did the work of posthumously compiling the rough notes left for volume 2 and volume 3 of *Capital* that would eventually be published in 1885 and 1894 respectively, 2 years and 11 years after the death of Marx. If anyone were in a position to publish these works it would be Engels, who would have the most intimate knowledge of what Marx was trying to achieve with his work.

1. *The Executor*

This situation is reminiscent of other stories of great thinkers who had passed on and left behind an uncompleted legacy. Plato with Aristotle, Max Brod with Franz Kafka. Brod's role in the legacy of Kafka is particularly interesting. Kafka specifically instructed Brod to destroy his unfinished works as he was unsure of their quality. Brod persisted however, and now we have two epic, even though incomplete, works available to us: *Amerika*, and *The Castle*, that are important contributions to the canon of Kafka and even if incomplete help us understand more about who he was. Here we can perhaps say that Brod's work reflects the true essential nature of what Kafka wanted from his works even if he did not follow directions to the letter. The lesson is that although incomplete and not in their finished form, the charge of the executor was taken in earnest and conducted congruent to the request.

In contrast to this faithful work it might be best to put this story against that of Plato and Socrates. Both are accomplished thinkers, one clearly having influence on the other, but both equally engaged in the development of a philosophy that would resonate in time. Early Socratic dialogueues are often attributed as faithful renditions of Socrates' original thought. Closer to direct transcripts as it were. Though, there are some that suggest Plato might have used the mechanism of a Socratic dialog to advance his own ideas in a well-worn trope. In fact, the study of the true reflections and identity of one of the greatest philosophers of all time is given a name: *The Socratic Problem*. There

is a compounding dimension to investigating this faithful representation with Socrates when we recount his words from *Phaedrus* where he besmirches the technology of writing: "They will cease to exercise memory because they rely on that which is written, calling things to remembrance no longer from within themselves, but by means of external marks."[1] It would appear as though the legacy of Socrates is guided by his own hand, by casting doubt on the written word a failsafe of sorts is included into the lore associated with his memory. By doubting the invention of writing, any consequences that derive from it are immediately suspect.

We can take these two examples as the opposite ends of a spectrum of what the intended charge of the executor is to be. It is worth now, asking the question: where does the relationship of Marx and Engels fall within this spectrum?

2. *Marx Promethean*

A version of this question is posed, and seemingly definitely answered by Kohei Saito in the early pages of *Marx In the Anthropocene: Towards the Idea of Degrowth Communism*. In the great tradition of reading groups as methods for understanding and learning, the Posthumanism Research Institute at Brock University in Canada sought to work through the pages of this book to delve into the hypothesis advanced by Saito of the necessity of embracing degrowth Communism. To get to this end state, the first step was to advance evidence that Marx supplanted the focus of his thinking from historical materialism and political economy and instead moved into the realm of ecology, instead of an almost nihilistic view that the advancement of capital shapes society. In order to substantiate an effective argument that there exists an identifiable thread of Marx's understanding toward ecology a look into the 'back catalogue' as it were, is needed. Marx is notoriously a compiler of notes, responses to other thinkers, and correspondence that just seemingly fills the shelves without seeing the light of day in a finalized way. Take the *Grundrisse* as perhaps the best known example of this. Written in 1857-1858 this impressive 900 page tome was merely set aside as Marx's thinking would compel him to change his attention instead to writing *Capital*.

[1] Plato 1995.

If you do dig into the vast multitude of these manuscripts and papers one can see that Marx's works contain sufficient evidence that a turn in his thinking was percolating. In particular seen by looking at his notebooks and other writings from 1868 and on. The *Marx-Engels-Gesamtausgabe* and *Marx-Engels Collected Works* anthologies contain what is needed to see this transformation. The real quandary is why isn't mainstream understanding of Marx aware of this late emerging theme? One possible solution is that Engels de-emphasized this line of thought, and when reckoning with the output of the duo, history associated Engels's name with scientific understanding and inquiry at least in part due to his works: *Dialectics of Nature*, and *Anti-Dühring*. When describing the goals of the chapter investigating this dynamic, Saito asserts: "By focusing on Marx's research in natural sciences ignored by Western Marxism, it aims at revealing the differences in terms of the ecological critique of capitalism between Marx and Engels."[2] . Saito traces back this animus to its genesis with György Lukács' *History and Class Consciousness* and comes to a conclusion that "Western Marxism thus regarded the realm of natural science as Engels's domain of expertise and completely separated it from Marx's dialectic philosophy of society."[3]

If Engels is ascribed as having the enlightened, scientific, progressive understanding, what is leftover for Marx? As it so happens accusations of a Promethean worldview are one such criticism levied against him. The story of the titans is one of failure at the hands of the more powerful gods. Prometheus is particularly chided in his eternal punishment. After bringing fire from the gods to mere mortals his penance was to be earned by being chained to a rock and perpetually undergoing hepatectomy from carrion. This story is not often viewed as an emancipatory, empowering tale of the advancement of technology over savagery, but a cautionary legend of avarice that is the consequence of reliance on technology. We may then ask: what is the cautionary tale at play when Marx is accused of being Promethean? At least one way to answer this is by suggesting that the consequence of historical materialism means that humans have conquered nature and now force it to bend to its whims, ultimately the whims of capital. This prescriptive understanding of Marx's view is at least consistent

[2] Saitō 2023, pp. 44-45.
[3] Saitō 2023, p. 47.

with works up to and including *Capital*. Take for instance his allusion to the tightness of the bonds Prometheus endured as a way to describe the tortuous consequences of the general law of capitalist accumulation: "So the accumulation of wealth on one side of the capital relation is simultaneously the accumulation of misery, torturous labor, slavery, ignorance, brutality, and moral degradation."[4]. Even in Marx's telling, the fate of Prometheus is to be avoided.

Much scholarship has been devoted to building the case of Marxist Prometheanism, John Bellamy Foster in his work *Marx's Ecology* sums it succinctly: "This charge of "Prometheanism," it is important to understand, carries implicitly within it certain anti-modernist (postmodernist or premodernist) assumptions that have become sacrosanct within much of Green theory. True environmentalism, it would seem, demands nothing less than the rejection of modernity itself." [5]

3. *Saitō and Marx*

Saito offers a reprieve by saying we see a true turn in Marx's thinking when we go beyond the 1860s and examine how his thinking of real subsumption has changed and that "Marx came to realize that the capitalist development of technologies does *not* necessarily prepare a material foundation for post-capitalism."[6] Next, through a careful breadcrumb trail of evidence a conjecture is made that Marx had a wholesale change in his conception of 'mode of production' due to his developed idea of *cooperation* not present in the *Grundrisse*, a work that forms much of the basis of left-accelerationism, ultimately to a conclusion that: "It is clear that the development of productive forces of capital do not prepare the conditions for such a sustainable regulation of the metabolism with nature. In other words, even if the 'fetter' of the development of productive forces is overcome through the transcendence of the capitalist mode of production, capitalist technologies remain unsustainable and destructive and cannot be employed by socialism."[7] *Metabolism with nature* being a crucial part of the narrative of Saito's book and the basis of the Marxist connection

[4] Marx 2024, p. 591.
[5] Foster 2000, p. 35.
[6] Foster 2000, p. 8.
[7] Marx 1993, p. 158.

to the Anthropocene. Or once again looking to Foster, this is for Marx "his mature analysis of the alienation of nature."[8] This idea of metabolism will undoubtedly be part of our discussions on this panel.

4. *Marxology*

This hermeneutical exercise of Saito is but one component of a richly textured book, but it does require us to float a consideration. Is this work preoccupied, and best accurately described as an example of contemporary Marxology? That is said almost as if it were a pejorative, but that is not the intention. It might be worth quoting a 2015 article from the *International Marxist-Humanist Journal* by Sankar Ray:

> Marx wanted his contributions to be continuously enriched through scientific research and his incompleteness be rid of gradually. That was why *Das Kapital* is 'unfinished and unfinishable'. Unfortunately, Marxists, Marxist academics and the like, distinctively different from Marxologists, have ignored Marx's appeal to treat his works with a scientific temper. They do not keep in mind Marx's Cartesian motto, De omnibus dubitandum (doubt everything)."[9]

Does the thesis of Saito's book rely too heavily on interpretation and re-interpretation of Marx lore? Is it fair to construct revisionism on unpublished, uncompleted, notes and fragments? Let us conclude as we began, by looking back at our first framing of the responsibility of the confidant and executor that finds themselves the beneficiary of a lifetime of work of undoubtedly worldly importance. Between Brod and Plato, where might we place Engels?

No one has dared to suggest that such a thing as the Marxian Problem exists, but if a consequence of properly proportioning the contributions of each of these two important thinkers is multiple centuries' worth of scholars keeping the works of Marx and Engels alive through rigorous debate and study, that is not that bad a consequence.

[8] Marx 1993, p. x.
[9] Ray 2015.

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What about Engels?
The political ecology of Marx's second fiddle

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Abstract

The priorities of a capitalist and colonial system are at odds with a just and a livable future for the majority of people worldwide. Contributions based on Marxist thought can potentially gain a hearing. One such book is Kohei Saito's enormously popular 2022 book, Marx in the Anthropocene. In part Saito's argument is built on a critique of Marx's lifelong collaborator Friedrich Engels as an ecological thinker. Saito contends that Engels failed to integrate his understanding of natural science and political economy. Instead, Saito contends that Engels primarily conceived dialectical processes as universal laws that humans must understand in order to avoid the "revenge" of nature. However, by revisiting Engels' writings, we can indeed identify a sensibility that now we might call political ecology. His perspective allowed him to recognize that humans have shaped the biosphere but also to begin to outline how this relationship influences human lives differently according to class. This perspective is crucial in understanding why contemporary capitalism seems characterised by its ability to subject sections of the population to what Engels would refer to as social murder.

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Keywords: Karl Marx, Friedrich Engels, Ecology, Cities, Metabolism

This conference takes place amid constant news reports of devastating and unnatural disasters, whether it is the lethal flash flooding in Valencia a few months prior, the deadly West African floods or the extreme heat that killed more than a thousand Hajj pilgrims in Mecca. It takes place amid an ongoing Israeli genocide in Gaza that has meant the slaughter of tens of thousands of people and the destruction of the means of living including the desecration of the natural environment. And it appropriately takes place in Venice, a city with its own recent experience of worsening floods and a longer history of deadly pandemics.

Climate and ecological breakdown is one element of what Alex Callinicos refers to as a new age of catastrophe.[1] There are multiple intersecting crises, economic, geopolitical and ecological, that all have their roots in capitalist competition and accumulation. This is the wider context in which we are discussing ecological Marxism – the context of a need to try to grasp the nature of the capitalist, imperialist ecological system – what is it about the system that is so destructive and what direction is it heading in?

1. *Saito on Marx and Engels*

This is the context in which I want to turn to Kohei Saito's influential book *Marx in the Anthropocene: Towards the Idea of Degrowth Communism* and the kind of ecological Marxism it promotes.[2] The similarity between the title of the book and the name of the conference for which this talk was prepared appears to be a coincidence.

The book makes several bold and important claims. Saito argues that there was a break between the ideas of the early and late Marx. He goes as far as to say that after the publication of the first volume of *Capital* in 1867, Marx's worldview was thrown into crisis.[3] Marx apparently needed consciously to abandon historical materialism and was no longer interested in the development of productive forces – in advances in the equipment such as tools, machinery, methods and knowledge, etc., used to produce goods and services in a society. This is an extraordinary claim as "historical materialism" is often treated as synonymous with Marxism itself. For example, in their discussion of

[1] Callinicos 2022.
[2] Saitō 2022.
[3] Saitō 2022, p. 173.

Engels as an ecologist, Brett Clark and John Bellamy Foster state that, for Marx and Engels, "Historical materialism served as the foundation for all of their work".[4] Saito asserts that Marx became what we would now call a "degrowth" thinker in his later years. In other words, he took a somewhat similar approach to those thinkers today who advocate for a planned and managed reduction in material and energy throughput in the economy, which might also lead concurrently with a slowing of GDP growth.[5]

Saito is evidently uncomfortable with the idea that technological development could provide luxury to workers or that development of productive forces could lay the basis for a transition to a post-capitalist society as some argue. Instead, Saito sees the development of productive forces almost wholly in negative terms – as necessarily involving the subsumption of labour power and the degradation of the natural environment. For example, he says that "The increase of productive forces subordinates workers to the command of capital more effectively".[6] This severely restricts workers' ability to organise for a better society.

In general, Saito is opposed to the idea that the contradictions within capitalism lay the basis for a new form of society. He objects to Engels' characterisation in Socialism: Utopian and Scientific, where forces of production come into conflict with the relations of production as they develop. For example, Engels refers to the inability of capitalists to avoid economic crises. He says, "In every crisis, society is suffocated beneath the weight of its own productive forces and products, which it cannot use, and stands helpless, face-to-face with the absurd contradiction that the producers have nothing to consume, because consumers are wanting. The expansive force of the means of production bursts the bonds that the capitalist mode of production had imposed upon them".[7] Instead, in Saito's analysis, forces and relations of production, rather than conflicting and contradicting, tend to correspond to each other.

This conference contribution addresses one aspect of Saito's contention, the way he builds this argument by drawing a distinction between Marx and Engels on questions of ecology.

[4] Clark & Foster 2006, p. 378.
[5] For an important discussion of Saitō and degrowth, see Napoletano 2024.
[6] Saitō 2022, p. 155.
[7] Engels 1970.

Whether Marx and Engels agreed with each other on questions of philosophy in general and on the philosophy of science in particular is the subject of some debate among Marxists. Engels partly fuelled this debate by describing himself as a "second fiddle" to Marx. Although an important political thinker and organiser in his own right, he took on a role during his lifetime as a publisher, populariser and of course a financial backer of Marx. In the 20th century, Western Marxism elevated differences in Marx's and Engels' interests and activities to the level of a fundamental difference in philosophies. Western Marxism saw the natural sciences as Engels' domain of expertise whereas Marx focused on questions of social science and political economy.[8] And the idea spread that Engels was misguided in attempting to apply Marxist dialectics to matters beyond the human world. At the same time, a form of what Saito calls "traditional Marxism" developed and became influential in the Soviet Union. This was "a closed dialectical system that would enable the working class to comprehend the truth of the universe" including questions of science and nature.[9]

Marx and Engels did operate something of a division of labour. But the idea that the two friends were working on two totally different projects in later life and that the one didn't know what the other was doing is hard to sustain. In this period of their lives they spent many hours visiting one another in London and wrote to each other and read each other's manuscripts.[10]

Furthermore, we now know in large part due to Saito's own work in analysing Marx's late manuscripts just how deep Marx's engagement with the natural sciences was. Marx was enormously interested in the natural sciences, especially in the soil science of Justus von Liebig and its implications for understanding capitalist agriculture as a form of robbery from the soil, which drove an acute soil fertility crisis in the 19th century.[11]

Saito agrees in general that differences between Marx and Engels have been overstated. But he says there was nevertheless a subtle but important difference in the character of their ecological work – both were interested in the natural sciences but for very different reasons.

[8] Foster 2023.
[9] Saitō 2022, p. 45.
[10] Hunt 2009.
[11] Saitō 2017; see also Clark et al. 2019.

2. *What was the "different character" of Engels' natural science?*

At the core of Marx's ecology is the notion of metabolism. Humans, like all species, maintain a metabolic relationship with the rest of the biophysical world in order to survive. We all exchange energy and material with the natural environment. For humans, this relationship is mediated and regulated by collective activity.[12] As Saito explains, under capitalism, this exchange between humans and nature is transformed by the imperative to accumulate ever more capital, with catastrophic effects on the biosphere. Importantly, this happens simultaneously with and as a consequence of the reorganisation of labour regimes in order to extract surplus value from workers. This capitalist transformation has been described by John Bellamy Foster and others as a metabolic rift.

Saito says that Marx recognised, "the danger of a serious global disruption to the interdependent process between 'social metabolism' (capitalist production, circulation and consumption for the sake of profit) and the 'natural metabolism' prescribed by natural law (plant growth and soil ecology). This is the problem of the second-order mediation of the universal metabolism of nature that exists independently of human beings".[13]

According to Saito, Marx uses the concept of natural metabolism in order to show how in practice capitalism has its own metabolic organisation that conflicts with the processes of natural metabolism. "The metabolism between humans and nature is modified and reorganised" under capitalist social relations.[14]

By contrast, Engels was – according to Saito – working on uncovering transhistorical and universal laws of dialectics that exist in nature. In the *Dialectics of Nature* (written in the 1870s and early 1880s and unpublished during Engels' lifetime), Engels intervened in several contemporary debates among scientists about processes in the biophysical world, making use of the dialectical approach developed by himself and Marx. Engels did understand metabolism, which had been discussed by physiologists from the early 19th century. But he understood it in the sense that organic entities are involved in a metabolic interchange with their environment. It is a concept that can help

[12] Clark et al. 2019.
[13] Saitō 2022, p. 53.
[14] Saitō 2022, p. 58.

in these scientific debates, for example around the origins of life from inorganic matter. According to Saito, "The main role [Engels] assigns to metabolism is not as an ecological analysis of capitalism but as a demonstration that this objective law penetrates the whole of nature encompassing both inorganic and organic beings".[15]

Where Marx's philosophy of metabolism integrated political economy and ecology, Saito says that Engels was more concerned with the universal characteristics of nature. Therefore Engels apparently failed to understand the methodological role that metabolism plays for Marx. He did not grasp the way in which, for Marx, capitalism disrupts the human metabolism with nature through the subsumption of labour. Saito even argues that Engels obscured some references to metabolism from Marx's *Capital* when he was editing it for publication – although this may not have been intentional obfuscation.[16]

Furthermore, Saito says that Engels' approach to questions of nature "pivoted around nature's revenge".[17] He refers to a rhetorical passage intended to form part of the *Dialectics of Nature* where Engels points out the disastrous consequences of human hubris in thinking that we as a species can "dominate" over nature.

> Let us not, however, flatter ourselves overmuch on account of our human victories over nature. For each such victory nature takes its revenge on us. Each victory, it is true, in the first place brings about the results we expected, but in the second and third places it has quite different, unforeseen effects which only too often cancel the first. The people who, in Mesopotamia, Greece, Asia Minor and elsewhere, destroyed the forests to obtain cultivable land, never dreamed that by removing along with the forests the collecting centres and reservoirs of moisture they were laying the basis for the present forlorn state of those countries.
>
> Thus at every step we are reminded that we by no means rule over nature like a conqueror over a foreign people, like someone standing outside nature – but that we, with flesh, blood and brain, belong to nature, and exist in its midst, and that all our mastery of it consists in the fact that we have the advantage over all other creatures of being able to learn its laws and apply them correctly.[18]

[15] Saitō 2022, p. 57.
[16] Saitō 2022, p. 54.
[17] Saitō 2022, p. 56.
[18] Engels 1934.

Engels here rightly reaffirms the basic ecological premise that humans are an animal species that exist as part of nature and need to maintain a sustainable relationship with the rest of the natural world in order to survive. Such a materialist conception had been the starting point for Marx's and Engels's writings on nature throughout their careers. What Saito finds more problematic is Engels' implication in this passage that the solution to heal our broken relationship with nature is to seek to better understand its laws so that we might master it in a more rational way.

Acts of "revenge" on the part of nature are often unforeseen by those who seek "conquest" over it. But if humans were able to develop more scientific understanding of nature's laws and attributes, perhaps we might predict the consequences of our actions and avoid such catastrophes. Saito ascribes an emphasis on development and scientific progress to Engels that is not present in Marx – at least not in Marx's later, degrowth communist period.

It can be tempting to think about natural disasters as a form of revenge. But disaster geographers rarely think in these terms.[19] Referring to the revenge of nature can imply a singular and undifferentiated human species and also a distinct nature that exists outside human society and that reacts back when humans act upon it. This downplays the extent to which humans modify and shape the natural world, the way they can be said to produce nature in capitalist terms.

Saito accuses Engels, with his apocalyptic rhetoric, of playing down the capacity for workers to resist the subsumption of their labour to the needs of capital accumulation. Whereas Marx calls for humans to rationally and consciously gain control over socionatural metabolism, Engels rather seems to suggest an inevitable collapse of capitalism through nature's revenge. However, John Bellamy Foster, the key theorist associated with the notion of metabolic rift, has strongly criticised Saito on these points, insisting that there are no significant differences between Marx and Engels' respective approaches to natural conditions.[20]

[19] See Smith 2006.
[20] Foster 2023.

3. *Revisiting Engels' ecology*

The passages on the revenge of nature are only one part of Engels' ecological writings, which are many and varied.[21] It is a topic he touched on throughout his life. Engels would not have used the term "ecology" in the sense of a social movement oriented towards attempting to protect nature, or in the sense of a strand of the natural sciences we are familiar with today. However, if we understand ecology broadly as the field concerned with relationships and interactions between organisms and the inorganic world, much of Engels' work deals with ecology. Throughout his career, he addressed themes of urban air and water pollution, contagious diseases and human health in his writings. Furthermore, when considering his work more broadly, it is far too much of a stretch to say that Engels' ecology "pivots" around the revenge of nature.

In one of Engels' earliest journalistic works, the "Letters from Wuppertal", he exposed the environmental and social effects of industry in Germany's Wupper Valley. As well as discussing the long hours in dusty and smoke-filled rooms suffered by the weavers, he also explained how the dye-works were polluting the rivers, staining the waters red.[22] In *The Condition of the Working Class in England*, Engels returned to the subject of polluted rivers. Writing on Manchester, he memorably described the state of the Irk:

> At the bottom flows, or rather stagnates, the Irk, a narrow, coal-black, foul-smelling stream, full of debris and refuse, which it deposits on the shallower right bank. In dry weather, a long string of the most disgusting, blackish-green, slime pools are left standing on this bank, from the depths of which bubbles of miasmatic gas constantly arise and give forth a stench unendurable even on the bridge forty or fifty feet above the surface of the stream.[23]

In the same work, Engels raged at the toxic living conditions of the urban workforce both within the workplace and in the areas where they lived. For example, he discusses the horrendous chest infections associated with glass blowing and the diseases experienced by metal

[21] Clark & Foster 2006.
[22] Engels 1839.
[23] Engels 2009, p. 89.

grinders caused by breathing in particles of metal dust.[24] Engels famously drew on the terminology of the Chartist movement of the time to refer to these conditions as tantamount to social murder. By this he means the ruling class within society knowingly drives people into a situation in which they "inevitably meet a too-early and an unnatural death".[25]

In a much later work on the Housing Question, Engels discussed the acute housing crisis that forced working-class people into poor-quality, crowded housing that was often on the outskirts of town. Again, there is an ecological element to Engels' discussions. For example, where he quotes the Manchester newspapers in describing how the family of an unemployed labourer had spent the night in their flooded basement home and spent most of the night awake and vomiting due to the rancid smell.[26] In both the 1840s and the 1870s Engels discussed infectious diseases including the deadly 19th century cholera outbreaks.

In his writings, Engels evidences a broad interest in the way in which humans – organised in a particular way – produce a type of urban environment that we then live within. The way human societies create a socio-natural environment for ourselves can have unpredicted and uncontrolled consequences. For example, if we produce the ideal conditions for infectious diseases to spread, we risk producing a potentially deadly pathogen outbreak. This could be understood as a simple reciprocal relationship whereby humans manipulate the natural world and it acts back on us in surprising ways. But it could also be conceived as a case of a socio-natural environment being reshaped in the interests of the ruling class in a way that facilitates the outbreak of deadly pathogens. These effects are also uneven in that in this case the poorest and most vulnerable are most likely to be killed.

Engels' outlook is broadly compatible with what we might today call urban political ecology.[27] This tendency recognises that "nature" exists in urban areas, following the strong critique of the association of nature with the rural or with wilderness. Indeed, cities themselves are considered to be constituted by processes that are simultaneously

[24] See Clark & Foster 2006, pp. 382-383.
[25] Engels 2009, p. 128.
[26] Engels 1872, p. 367.
[27] See Heynen et al. 2006.

both social and natural. Urban political ecologists such as the geographer Erik Swyngedouw have used the term metabolism to refer to these processes. Political ecology tends to involve a rejection of the assumption that ecological problems are caused by a faulty "human nature" or by an overabundance of population. Marx and Engels were likewise critical in their day of the pessimistic assumptions about population growth made by their near contemporary Thomas Malthus. Political ecology rejects these views as "apolitical". The solution to urban ecological problems is not to attempt to scale back the human impact upon an external nature. Instead there is a need to address the type of society in which we live and the type of power relations that exist within it. In short, a society's relationship with the natural environment is inseparable from the type of social relations that exist. Engels' worldview integrates an ecological understanding with an account of the development of human society, as does Marx's. For this reason, contemporary urban political ecologists have recognised that Engels was the first to account for the way in which environmental conditions of cities were "related to the class character of industrial urbanisation".[28]

Even the famous passages by Engels on the so-called "revenge of nature" do not simply concern an undifferentiated population acting on an undifferentiated nature. Engels points to an understanding of socio-natural systems as being dynamic and imbued with contradictions. Like Marx, Engels differentiates between humans from other animals through their capacity to act in premeditated ways, conceiving of their intended actions in the mind before carrying them out. But this is not to say that there is no "planning" at all on the part of other animals. Engels observed while out fox hunting – which, to today's reader will seem a surprising hobby for a Marxist – that foxes also demonstrate some degree of planning when they try to outsmart the hunt.[29]

However, he says:

> But animals exert a lasting effect on their environment unintentionally and, as far as the animals themselves are concerned, accidentally. The further removed men are from animals, however, the more their effect on nature assumes the character of premeditated, planned

[28] Swyngedouw & Heynen 2003.
[29] Engels 1934.

> action directed towards definite preconceived ends. The animal destroys the vegetation of a locality without realising what it is doing. Man destroys it in order to sow field crops on the soil thus released, or to plant trees or vines which he knows will yield many times the amount planted. He transfers useful plants and domestic animals from one country to another and thus changes the flora and fauna of whole continents.[30]

The revenge of nature is not a product of humanity's ignorance. Humans organised in capitalist societies don't degrade the environment because we collectively fail to grasp a scientific understanding of what we are doing and to plan accordingly. Engels explains compellingly how Spanish planters in Cuba burned forests to produce fertiliser for one generation of very profitable coffee trees, undermining the possibilities for future use of the soil. This exposes a contradiction of the system where it is able to produce profit while undermining the future source of wealth.

Capitalists don't have the excuse of not knowing what they are doing. They are in general fully aware of ecological and climate breakdown. But they are compelled to further the destruction by the need to accumulate surplus value.

4. *Conclusion: The return of Engels?*

Clark and Foster describe Engels as "one of the most important socialist and ecological thinkers in human history".[31] However, Kohei Saito has more recently advanced a more sceptical take on Engels as an ecologist. This contribution has attempted to counter Saito's arguments on this topic. This is not just a scholastic exercise in defending Engels as a theorist. It is an attempt to use this debate to discuss the different ways of thinking about ecology that are at stake today.

Engels' work is remarkably – and depressingly – prescient. As Marx and Engels said, history repeats itself first as tragedy second as farce. Today we are still faced with catastrophic floods and deadly pandemics. Marx said that capitalism "can do nothing better with the excrement produced by 4 1/2 million people than pollute the Thames

[30] Engels 1934.
[31] Clark & Foster 2006, p. 376.

with it, at monstrous expense.[32] Today we still haven't found a way to keep human waste from the rivers. It is galling to see the water companies in Britain continuing to pay their shareholders' bonuses while blaming members of the public for flushing wet wipes down the toilet. Manure from 23 million chickens in the River Wye catchment area in Wales, leaches into the rivers and causes algal blooms, rather than being more rationally used as fertiliser.[33] The 19th century soil fertility crisis recognised by Marx was mitigated by the development of artificial fertilisers in the 20th century. But these brought their own ecological problems such as the eutrophication of freshwater. Attempts to solve ecological contradictions tend to create new and different contradictions.

Crucially, Engels' ecology is political – he reminds us that humans can resist their immiseration, concluding *The Condition of the Working Class in England* with a call for a "war of the poor against the rich". The ecological situation that confronts us today is not so much the revenge of an undifferentiated and monolithic "nature" but the brutal consequences of profit being prioritised over life – whether we are considering the imperial onslaught in Gaza or Spanish supermarkets keeping their delivery operations running in a torrential downpour. Although the level of organised resistance to ecological breakdown is relatively muted given the scale of catastrophe we face, climate activists are ever more willing to point to the need for systemic change.

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Nature's Crisis. A Hegelian Account

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Abstract

Both Anthropocene and ecological crisis point to a historical situation in which nature is not just externally affected by a crisis but undergoes, *as* nature, an intrinsic crisis, changing the very substance of nature itself. In Marx and Engels, this configuration is thematized in terms of the mediation of nature by the economic relations and scientific-technological conditions of modern society in which everything – including what seems to be independent 'first nature' – is integrated into the dominant logic of capitalism. This, however, does not imply that nature, in its substance, thereby just disappears without any resistance. Within the structural crisis that, according to Marxist analysis, is constitutive for capitalist reproduction nature rather re-emerges as a symptom of this crisis itself: as something that, as an object of exploitation, cannot be integrated into capitalism and, insofar, points to an irreconcilable contradiction. The contribution dwells on this crisis – as nature's crisis – by tracing it back to the systematic framework of Hegel's philosophy of nature according to which nature is intrinsically mediated by spirit, i.e., the historical-political world in which we live. As, for Hegel, this crisis is inscribed in spirit's overall process of liberation, it comes to the fore – as crisis – as the historical site at which change and transformation become possible through human action.

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Keywords: G.W.F. Hegel, crisis, philosophy of nature, philosophy of spirit, transformation

1. *Introduction*

The philosophical situation after Kant is confronted with the problem of how to bring together human subjectivity and autonomy *on the one hand* and nature, in its ontic-material priority and in its own right, *on the other hand*: practical philosophy and metaphysics of ethics – the moral realm of freedom – with theoretical philosophy and metaphysics of nature – the scientifically cognizable realm of natural necessity – as already Kant envisages it in his *Critique of Judgment* bridging the dualism between practical and theoretical reason. Far from being a merely epistemological question, this constellation entails a historically-politically determined ontological dimension. Whilst, along and compatible with the beginning of capitalistic development and its reduction of nature to an object of specialized observation following the purpose of industrial exploitation and manipulation, positivism – as it becomes dominant in the post-idealist epoch – focuses on sciences, as its complementary counterpart, romantic philosophy of nature (such as prefigured in early Schelling) focuses on the normative ideal of organic nature as a holistic, intuitive harmony that overarches the instrumentalist attitude of technological rationality. Confronted with this complementarity of abstract rationality and any form of irrationalism, mysticism, or *Naturschwärmerei*, Marx' and Engels' project tries to develop a relationship between human beings and nature that both highlights – against one-sided bourgeois positivism – the irreducible embeddedness of human life in the material basis of nature and that takes into account – against any romantic nostalgia – that in modernity all our relationship with nature is alienated, i.e., constitutively mediated and reflected by economic-technological and social-political relations and that there is, ultimately, not any more such a thing like 'first' nature at all (a circumstance to which

the term 'Anthropocene' basically refers). Human beings, accordingly, are, as Engels states, 'with flesh, blood, and brain'[1] part of nature, but – at the very same time – it is a central insight of historical materialism (as opposed to pre-Marxist contemplative materialism) that nature must be thought as more and more integrated in the social-historical process of the transformation of any pre-given 'first' nature by work. What early Marx envisages – admiring early Schelling –[2] as 'the resurrection of nature' in communism, understood as 'the realized naturalism of man and the realized humanism of nature,'[3] presupposes the entire work of pre-history – so that 'the jump to the realm of freedom'[4] is not at all a return to an original nature but the creation of a new nature. The totality of the relations of production thereby determines human beings' relation to nature – although, historically, nature precedes society. Instead of implying a dogmatist conception, dialectical materialism, insofar, can be understood as pointing to the dialectical unity of identity and non-identity in the relation between nature and society.[5] It is particularly in this systematic context that Marx' and Engels' works (which, of course, are characterized by many tensions in themselves and, not least, between the two authors) can be brought together with Hegel's philosophy of nature. For it is already Hegel's challenge to think nature both in its substantial status and, at the very same time, to conceptualize it, in the reflexive framework of a philosophy of nature, as systematically integrated in spirit's work of liberation and transformation of the world. The dialectical identity of the (speculative-logical) concept with nature – as epitome of what is in itself –, according to which '*that which exists in and for itself is the conscious concept and the concept as such is that which exists in and for itself*,'[6] thereby opens up an understanding of the concept's reflexive movement as the process through which nature's substance itself becomes subject – i.e., reflexively mediated in itself. Nature – that, insofar, as Engels claims, is in itself dialectical and, as nature, the very embodiment of dialectic, comprehending not only nature's substance but its reflection in the complexity of modern natural sciences

[1] Engels 1975, p. 453. Translations are mine unless otherwise cited.
[2] See Marx 1976, p. 420.
[3] Marx 1968, p. 538; cfr. Khurana 2024.
[4] Engels 1976, p. 226.
[5] Cfr. Schürmann 1990, p. 517.
[6] Hegel 1984, p. 33; 2010, p. 29.

–[7] thereby is what it is only by becoming something else. Instead of being reduced to causality, it opens up the teleological movement of freedom, which, as such, determines its actual reason.[8] Importantly, nature, insofar, is constitutively a process of transformation, which is intrinsically connected with spirit, i.e., the dynamic totality of the social-political, historical world in which we live, think, and act. And importantly, this process is – in virtue of its reflexive character – the process of nature's crisis: of a crisis out of which the historical world emerges – not in the linear chronology of a pre-determined necessity but as the emergence of a possibility in which human action, taking place at the moment of a crisis, is constitutively involved.

It is the aim of the present paper to outline some aspects of this crisis. It thereby is, not least, the ecological crisis with respect to which this complex systematic relationship between nature and spirit deserves a particular practical interest.

2. *What Is a Crisis?*

In his early Hegelian-Marxist work, *History and Class Consciousness. Studies in Marxist Dialectics*, confronted with the deep crisis after World War I and the need for and necessity of change in its aftermath, Georg Lukács emphatically criticizes a naturalist stance towards the predicament of this crisis – as represented by the economical determinism and historicism of the Marxism of the II. International. For such a conception, history is an evolutionary process – so that 'natural laws' could tell us what we are supposed to do at a certain stage of this process. Against this naturalist setting, Lukács claims that seemingly objectively recognized laws and facts essentially never can provide us the sufficient base for a political action as it should take place at the right moment, the καιρός of this very crisis. For in a constitutively reflexive circularity, before starting to act, we always already must have decided which facts will have been the sufficient base for our action (– an action that Lukács, in his Marxist framework, understands as the revolution, the jump from natural history, the natural 'realm of necessity' to communism understood as the 'realm of freedom'). Decision, as Lukács puts, within this reflexive structure, necessarily precedes the

[7] See Engels 1976, p. 205.
[8] See Hegel 2000, §154, p. 94.

facts. This structure, indeed, for Lukács cannot be reduced to an empty and merely formal decisionism (or a Heideggerian *Entschluss*) as the acting subject – which, in this Marxist interpretation, is the revolutionary proletariat – is itself materially embedded in the substantial objectivity of the society whose crisis opens up the possibility of its transformation. The proletariat, in Lukács, is the identical subject-object of the social totality determined as the naturalized 'reification' of capitalist society. Being involved in the structure of Fichte's *Tathandlung* and, ultimately, Hegel's *Geist*, spirit, the revolutionary subject *is what it makes out of itself, itis*, in its singularity, its own action as the socially embedded coincidence of subjectivity and objectivity as well as of universality and particularity. Spirit is spatio-temporally situated in history, it is 'determinate spirit [bestimmter Geist],' 'figure [Gestalt]' – and it is, as Hegel equally says, 'only that to which it makes itself.'[9] Whoever, as Lukács states, in this situation of a crisis refers to something like 'natural laws,' in truth, just does not want that a real change takes place at the decisive moment of a crisis. For Lukács, in order to criticize this naturalistic view on history and to think of crisis as the precarious historical site, the moment at which a real change can take place if (and only if) this moment is grasped, it is necessary to critically re-actualize Hegel.

A real change, a revolution whose temporality would follow the linear evolutionary process, in reality, never can take place. Along with the real event of a change, already the very diagnosis of this situation as the situation of a crisis thereby is integrated in this reflexive circularity. The diagnosis itself turns out to be dependent on the real interest and decision to discern this situation as a crisis. After all, there always are presumable alternatives to real change – and a crisis, seemingly, always can be re-normalized and re-naturalized – i.e., re-integrated into the seemingly 'normal,' pre-critical and pre-reflexive state of things. There is always the possibility to connect the empty signifier 'crisis' with such a re-naturalization: i.e., to naturalize the term 'crisis' by using it all the time and, insofar, to make it inoperative, to use it as a *simulacrum*. There are many examples for this strategy of an inflationary use of the word today – for strategies that efface the possible critical potential of the word 'crisis'. If crisis can be understood as a situation in which the old forms and institutions externally still exist,

[9] Hegel 1970, p. 75.

whilst they have lost their content and their grip on the real life, the lived experience and actual thinking of people their 'natural' immediacy, the word 'crisis' itself can be confronted with its own crisis: with a state in which the word 'crisis' is used *propositionally* without being at work *performatively* – so that, whilst tendentially everything is labelled as crisis, this only hides a reality in which, under the hegemony of the word 'crisis,' things stay what they are, or in which things are 'changed' only in an inoperative way, without the real and serious work of a transformation and the engagement for it.

Talking about constellations of crisis, insofar, we are confronted with this reflexive and retroactive logic: There is no neutral and indifferent, seemingly natural standpoint from which we could judge about the situation we experience or describe as a crisis. The logic of crisis is caught in this both epistemological and ontological circularity – and therefore, crisis is *per se* a polemical, contested concept. The dominant crisis of our time, the ecological crisis, can exemplify this. Being the diagnosis of a, seemingly, merely scientific insight, it cannot be separated from its political-normative consequences, i.e., from possibly radical interventions in the very structure of our economy. Insofar, the ecological crisis is paradigmatic for the specific intersection between nature and spirit as it is constitutive for the very concept of crisis itself. A crisis will have been a crisis if there is a real practical interest and perspective, a both normative and ontological commitment to perceive a historical time as the time of a crisis: to think and to act, to live in this crisis and to embody it, to become this crisis' – socially, politically, culturally – engaged subject, who enacts and performs, out of her participating perspective, the transformative change that is inscribed in the predicament of the crisis as its possible – emancipatory – outcome as something qualitatively new.

3. *Spirit's Primacy over Nature*

It is by taking seriously Hegel's entire system, including the *Philosophy of Nature* situated between the *Logic* and the *Philosophy of Spirit*, that we can find the moment of subjectivity and of crisis as the unique and singular place of a possible change and of novelty in the world in Hegel: a moment that, within this systematic framework, in Hegel may be even more radical than in Lukács. Without downplaying the important role of Schelling's early twist towards a philosophy of na-

ture (in its affirmative conception of nature) for the formation of Hegel's absolute idealism, it is a particularity already of early Hegel's conception to emphasize the systematic-ontological and ethical-political primacy of spirit over nature, i.e., nature's reflexive-negative mediation. 'The Absolute,' we can read already in the Jena period (in which Hegel is still close to Schelling), in the *Essay on Natural Law*, against a Spinozist-Schellingian indifference between nature and spirit, 'is that which intuits itself as itself, and that absolute intuition and this self-knowing, that infinite expansion and this infinite recovery into itself, are simply one. But on this account, if both, as attributes, are real, spirit is higher than nature. For if nature is absolute self-intuition and the actuality of the infinitely differentiated mediation and unfolding, then spirit, which is absolute intuition of itself as itself (or absolute knowing), is, in the recovery of the universe into itself, both the scattered totality of this multiplicity, which it overarches, and the absolute ideality thereof in which it annihilates this separateness, and reflects it into itself as the unmediated point of unity of the infinite Concept."[10] What Hegel already here calls spirit's 'overarching' (*Übergreifen*) over nature, anticipates the central speculative-logical figure of the concept's 'overarching universality' in his mature *Science of Logic*.[11] Nature, in terms of its logical and ontological status, in this systematic framework, is constitutively dependent on the idea: 'Nature,' Hegel outlines in §247 of the *Encyclopedia*, 'has presented itself as the Idea in the form of *otherness*. Since therefore the Idea is the negative of itself, or is *external to itself*, Nature is not merely external in relation to this Idea (and to its subjective existence Spirit); the truth is rather that *externality* constitutes the specific character in which Nature, as Nature, exists.'[12] Although it thereby is equally relevant that the idea points beyond itself insofar as its self-positing negativity necessarily always already pre-supposes nature as its 'other,' its shadow,[13] within the speculative structure of an 'overarching,' this relationship is *per se* not a symmetrical and indifferent relationship, implying a pre-given equilibrium between nature and spirit, but a one-sided and partial one as it *per se* goes in only one direction. Nature thereby does not emerge

[10] Hegel 1968, p. 464; 1975, pp. 111-112.
[11] See, e.g., Hegel 1981, p. 38.
[12] Hegel 1992, §247, p. 237; 2004, §247, pp. 13-14.
[13] Cfr. Wandschneider 2022, p. 47.

immediately but – having gone through reflection, as the idea's alienation, as 'being estranged from the Idea' –[14] as a mediated immediacy. In another text from the early Jena period, the fragment *The Essence of Spirit* [*Das Wesen des Geistes*], Hegel accordingly highlights spirit's singular position in nature, spirit's free power to resume and to reflect in itself the entire universe: Spirit 'is free by becoming the empty that has the entire nature opposed to it and it is alive by equating itself to this whole.'[15] Within the extensive infinity of the natural universe, spirit designates the unique point of an interiorization of the universe – and human subjectivity, as spirit's most intensified form, thereby is, as one of the most poetical passages in young Hegel has it, 'this night, this empty nothing.'[16] In line with this, in his mature *Philosophy of Right*, spirit's 'solitude' still comes to the fore in the very middle of the 'second nature' of the ethical world, in the middle of *Sittlichkeit*, in which conscience (*Gewissen*), as the most intensive and internalized expression of spirit's subjectivity, negativity, and reflexivity, is not just absorbed and neutralized by the 'second nature' of the ethical substance but persists as the irreducible moment of spirit's 'deepest internal solitude with itself in which everything external and all limitations have disappeared':[17] as spirit's 'sanctuary [Heiligtum],'[18] which, at the end of Hegel's system, in religion, again comes to the fore as absolute spirit's 'separated sanctuary.'[19]

Along with this, Hegel situates the moment of crisis – and, connected with it, the possibility of real change and transformation – decisively not in nature but in nature's transition to spirit. After all, there is no 'first' nature at all. Paradoxically, nature – emerging as a mediated immediacy within spirit's world – as such is the very symptom of nature's crisis, pointing to '[first] nature's death,'[20] which, in and as spirit's 'second nature,' articulating 'the turning point where nature finds itself inflected or inverted,'[21] always already has taken place.

[14] Hegel 1986a, §247, Z, p. 25; 2004, §247, Z, p. 14.
[15] Hegel 1998, p. 373.
[16] Hegel 1976, p. 187.
[17] Hegel 1986b, §136, Z, p. 254.
[18] Hegel 1986b, §137, Z, p. 255.
[19] Hegel 1986c, p. 343.
[20] Hegel 1986a, §376, Z, p. 537.
[21] Duque 2018, p. 50.

4. *Spirit's Transformation of Nature*

In a prominent passage of the *Preface* of his *Phenomenology of Spirit*, Hegel gives a description of what he understands as a crisis – understood as the corrosive process of the naturalized objectivity of the old world – in his present: 'Besides, it is not difficult to see that our own epoch is a time of birth and a transition to a new epoch. Spirit has broken with the previous world of its existence and its ways of thinking; it is now of a mind to let them recede into the past and to immerse itself in its own work at reshaping itself. To be sure, spirit is never to be conceived as being at rest but rather as ever advancing. However, just as with a child, who after a long silent period of nourishment draws his first breath and shatters the gradualness of only quantitative growth – it makes a qualitative leap and is born – so too, in bringing itself to cultural maturity, spirit ripens slowly and quietly into its new shape, dissolving bit by bit the structure of its previous world, whose tottering condition is only intimated its individual symptoms. […] This gradual process of dissolution, which has not altered the physiognomy of the whole, is interrupted by the break of day, which in a flash and at a single stroke brings to view the structure of the new world.'[22] Although Hegel uses, for the description of this present crisis – situated in the epoch of French Revolution and its contradictory outcomes, metaphors from organic nature, one should be aware of the perspective thereby at work: The crisis and the process of the transformation of the world is brought about by spirit's continuously ongoing – invisible – work and its negativity, which – in a qualitative jump – interrupts from within, from an immanent perspective, the external objective reality of a merely gradual evolution. In the situation of a crisis the institutions and forms of the existing states have become empty – and it is spirit's internal negative work that bursts them from within by bringing about a new world. It is a common feature of all of Hegel's writings on political and historical processes of crises, of transformations and revolutions, that he emphasizes their 'spiritual' character. In contrast to most of the other contemporaries of French Revolution – such as, as its supporters, Kant, Georg Forster, or, even Fichte, but also its opponents, such as the later Friedrich Schlegel or Friedrich von Gentz who describe

[22] Hegel 1980, pp. 14-15; 2018, pp. 8-9.

the revolution as, *inter alia*, an earthquake, a stream, or a natural catastrophe or illness –, for Hegel, the real revolution takes place as a transformation of nature and natural processes.[23] Hegel, who, in contrast to any naturalism in terms of understanding social-political, historical processes, in his *Logic*, rejects a conception of contradictions, '[w]hether it occurs in actuality or in the reflection of thought,' that reckons them as 'an accident, an abnormality as it were, a momentary fit of sickness,'[24] accentuates, in line with this, the specific novelty of the French Revolution as an event that interrupts the repetitive 'revolution' of the planets by changing and qualitatively transforming the natural order.[25] Whilst development, in nature, for Hegel is a 'quiet' evolution, in spirit it is 'a hard struggle against itself,' not – as in nature – something external but an internalized struggle, an immanent crisis, a split inherent to spirit itself.[26]

This critical work of spirit cannot be limited to the stage of objective (as well as absolute) spirit but takes place already at spirit's beginning, at spirit's very first stage as subjective spirit in its exchange with nature. Spirit enacts itself as '*absolute negativity*,'[27] in a process he describes as "*saltus.*"[28] The very first act of spirit's self-constitution as spirit thereby takes place as the performative enactment of the process of a crisis in which something new – *namely*, spirit itself – is brought about. In a retroactive logic, spirit thereby is – vis-à-vis the continuum of nature and its linear evolution – nature's '*absolute first* [*absolut Erstes*].'[29] So, not nature – which (only) in a linear, as such natural(istic) evolutionary logic, in a chronological reading of Hegel's entire encyclopedic system, precedes spirit – is the first but spirit. From spirit's perspective, there is no linear evolution 'from nature to spirit' as, paradoxically, spirit begins with itself and thereby constitutes nature, the objective world, as a new, a transformed, as a 'second' nature. Nature, in this framework, is not the immediate identity of a 'first' nature but a transformed and idealized nature: involved in a process that Hegel describes, in his conception of subjective spirit,

[23] Cfr. Losurdo 1990.
[24] Hegel 1978, p. 287; 2010, p. 382.
[25] See Hegel 1986d, p. 529.
[26] See Hegel 1986d, p. 76.
[27] Hegel 1992, §381, p. 381.
[28] Hegel 1994, p. 52.
[29] Hegel 1992, §381, p. 381.

as spirit's activity of 'idealization,'[30] i.e., the transformative process in which spirit '*embodies* [verleiblicht]'[31] itself as the 'posited totality' of spirit's world.[32] Nature thereby is not reproduced as an immediate *status quo*, as the *old* nature but transformed in the ongoing process of the constitution of a *new* nature in which – mediated through crisis – nature becomes spirit's *own* nature, the posited reality of spirit's *new* idealized body and world. Only this world, for Hegel, is a world in which and as which free human action can take place: not as a naturally pre-given possibility but as the result of ongoing processes of crisis.

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[30] Hegel 1986e, §381, Z, p. 23.
[31] Hegel 1992, §401, p. 398.
[32] Hegel 1986e, §403, Z, p. 123.

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«Generic Determinateness» in Natural Human History: Social-Productive Subjectivity in Marx's Grundrisse

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Abstract

The understanding of human reproductive activity in its greatest synthetic manifestation as a genus-process (*Gattungsprozess*) and consequently as a process of human-natural metabolism (*Stoffwechsel*) determined in concrete historical forms, lies at the core of the project of the Critique of Political Economy. This work intends to outline some ideas on the theoretical ground of generic determinations of social metabolism and its methodological importance for Marx's work, stressing its role as a non-transcendental means of foundation of the synthetic unity of particular economic and historical practices into immediately social potencies of reproduction, and thus, as playing a relevant role in communist politics, namely, in grounding the problematic unity of theoretical activity and prescriptive or practical activity in the immanently self-normative character of the human genus's life process (*Lebensprozess*).

We discuss the fundamental concepts in the semantics of "production in general" in the Grundrisse – Notebooks II, IV, and V especially – offering a critical response to Marxist traditions that discuss the historicity of abstract labor, ignore the revolutionary form the relation between nature and production takes in capitalist society or question the persistence and relevance of *Gattungswesen* (species-being/generic essence) for Marxist theory and revolutionary politics.

This intervention proposes the *Grundrisse* as a key point in the continuous actualization of the problem of Nature in Marx's work by exploring its relation to Hegelian *Naturphilosophie*. We discuss *Gattungswesen* not as a vestigial trait of pre-critical "Humanism" to be outgrown in Marx's mature period, but rather a testament to the continuous presence of both an immanent critique of Idealism and

a Historical-Naturalism that only grew in systematic importance and complexity, rendering intelligible the actuality of the link between the theory of exploitation and its practical conclusion: the necessity of communism.

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Keywords: Genus, Subject-Object, Social metabolism, Nature, Synthesis

1.

The Chapter on Money[1] (Notebooks I and II) offers a remarkable panoramic presentation of the history of human production, or "the history of the distinctive way in which humans produce their life in specific ways"[2]:

> [1] Relations of personal dependence (entirely spontaneous at the outset) are the first social forms, in which human productive capacity develops only to a slight extent and at isolated points. [2] Personal independence founded on objective [sachlicher] dependence is the second great form, in which a system of general social metabolism, of universal relations, of all-round needs and universal capacities is formed for the first time. [3] Free individuality, based on the universal development of individuals and on their subordination of their communal, social productivity as their social wealth, is the third stage. The second stage creates the conditions for the third.[3] (Numerals added)

This statement will be our central interest. The relation and continuity between these stages is made intelligible by a positive conception of history as *natural human history*, or as the specific form of activity of a living, metabolic process that – as Marx describes in rela-

[1] Marx & Engels 1983, p. 42; Marx 1993.
[2] Marx & Engels 1958.
[3] Marx & Engels 1983, p. 91; Marx 1993, p. 158.

tion to human language – proceeds by simultaneously affirming and negating itself: a process of assimilation, retention, and subsequent negation of ossified historical forms. The exceptionality of the Capitalist Mode of Production as this "great form," a great revolutionary organization of social-general powers of human metabolism that sets the stage for the Society of Free Individuals through its revolutionary supersession, also requires explanation. The methodological core of the idea of generic determinations is paradoxically the critique of the "[…] eternization of historical relations of production"[4] in bourgeois scientific consciousness. Discerning the *bare bones* of economic activity that manifest themselves in every economic formation of society is to critique the appearance of specific historical forms of the Capitalist Mode of Production (*CMP*) as "[…] natural presuppositions, as natural conditions of the producer's existence"[5]. However, the real critical kernel of the idea of generic-determinateness lies in linking the scientific presentation of the economic laws of the *CMP* with the practical principle of its revolutionary transformation:

The only mention of *Gattungswesen* in the Grundrisse takes place in "*Forms Preceding Capitalist Production*" in the critique of the conception that social productive forces are the fruit of the association of isolated men, rather than the appearance of the isolated man the product of the historical development of these forces exercised upon objective conditions of labor on a general-social scale. The isolated man, in his isolated individuality, already manifests himself as a fully socialized being in the materiality of his powers for labor and consumption; and thus, fully as a member of a species (*Gattung*), exhibiting the determinations that identify them as such under any historical circumstance, and is the actuality and actualization of these species-determinations.

Property is among the great focal points of critical confrontation with Political Economy (for which capitalist private property is the genus of appropriation) as well as with other socialists. Marx questions that the slogan "society must be the appropriator of the fruits of labor" can be the basis of a communist program, for all societies have upheld (and are the concrete realization of) this principle, including the CMP. Every existing social order employs the organs of its own activity, through which it organizes the social capacity for

[4] Marx 1993, p. 85.
[5] Marx & Engels 1983, p. 397; Marx 1993, p. 489.

labor and consumption. Both statements – wealth and labor as the direct appropriation of Nature, and Society as the direct appropriator of this metabolic activity – are generic qualities of human social being. "Human natural history" is the history of the development of this generic determinacy into socially concrete forms, into diverse morphologies and forms of organization and conjunction of various productive faculties. Labor, in its generic sense, is the conscious[6], purposive expenditure of body and energy for the appropriation of its environment, through which the species reproduces itself as a living subject. Property is "a human being's relation to his natural conditions of production as belonging to him […] as presupposed along with his own being; relations to them as natural presuppositions of his self, which only form, so to speak, his extended body"[7]. This act of appropriation manifests the Genus as the immediate unity of the human organic being with its inorganic nature, which, in turn, exists only as sublated by the organism. "Man […] makes all objects his non-organic nature and objects for his knowing"[8].

Hegel states animal life "[...] presupposes an environing 'Other', which it is its task to receive sensitively, to transform practically, and in some cases to absorb and assimilate to itself"[9]. The system of Assimilation necessary for any given *Lebensprozess* is presented by Marx as the general *factum* of productive appropriation of Nature as *conditions of labor*. The terms *Eigenschaft* (property/attribute) and *Eigentum* (property/ownership) reflect this metabolic syllogism through which the purposive form of society as a living being reproduces itself. *Nature* is the *synthesis of objectivity* that a given social unity finds as the necessary content of its productive subjectivity, a subjectivity constituted by the very capacity for labor, which is the metabolic activity that transforms Eigentum into Eigenschaft, and in turn, exteriorizes and alienates these attributes into the means and conditions of reproduction of this process at a social-general scale. Consequently, there is no possibility for social metabolic activity to be considered a separate form of metabolism from that of nature. Marx asserts in Capital that "man confronts natural matter as (himself) a force of nature"[10]. The

[6] Starosta 2022.
[7] Marx & Engels 1983, p. 400; Marx 1993, p. 491.
[8] Hegel 2007, §361; 1992, §361.
[9] Hegel 2007.
[10] Marx 2014, p. 162; Marx & Engels 2017.

inorganic nature of productive subjectivity is a *factum* posited by its own activity, which in turn presupposes a certain passivity or limitedness: an *immanent, posited un-positedness.* Nature is thus nothing but *intimate externality*. Just as society is the appropriator of production in any economic formation, nature is always the negative reference of the conscious metabolic activity of a social formation. Natural social history, therefore, necessarily encompasses the historicity of the contents of nature that constitute the necessary negative reference for all general social metabolism, and is the history of this immanent rift – self-sustaining positing and negating of nature – that the organic, social-generic reproduction process necessarily entails.

Marx's idea of Nature is subsidiary to that of Kant and Hegel, as the idea of the systematic unity of what we can experience as confronting us. Let's remember how Marx cites, for example, how for certain societies there is such a thing as "Natural Slavery"[11]. Now for Hegel, what is distinctive of nature is this very form of otherness. He thinks the positing of Nature from the standpoint of an organism (*an inorganic nature for X*) as a process that happens within Nature. This otherness is otherness only to self-organized and self-reproducing natural beings. Paradoxically, such a natural being puts the idea of Nature (its knowability and unity) at stake for Kant.However this *endangerment* of Nature is immanent to "Natural ends" for Hegel.[12] Nature is, then, the entitativity of objects to a self-positing and self-regulating Life-process in metabolic relationship with it through *Assimilation*. In the Encyclopedia, Hegel states:[13]

This positedness of the non-organic is its sublatedness; it is not in itself (an sich). The organic being is self-subsistent; but the non-organic as an in-itself for the organic being is, in the first instance, the indifferent existence of both; but it then passes over into an existence which is a tension, into the form of being-for-self appropriate to the organic being.

Hegel himself allows an extension of the concept of Life to systematically unified, self-sustaining forms and structures[14]: v.gr. The earth as an organism[15], although in a very limited sense. Our goal

[11] Marx & Engels 1983, pp. 383-421.
[12] Koch 2023.
[13] Hegel 1992.
[14] Ng 2021; Suther 2020.
[15] Lyssy 2024.

is to convey in this non-metaphorical grounding of generic human activity in the *Gattungsbegriff* of living things a way of subsuming the historicity of specific human forms (their persistence, sublation, decay, homology with other structures, their mutual presupposition) under the logical "historicity" of Natural purposes through the development of the syllogism of a Living process with its genus and its nonorganic nature.

2.

Among the natural conditions of production is the generic condition that labor and the capacity for labor have an inherently social character[16]. Emphasizing this immediately social character as a generic determination – rather than as a historical quality specific to the CMP – is crucial for understanding Marx's statement. The issue, then, is demonstrating that the unity or organic totality of all individual labors as aliquot parts of a general social labor is neither an intellectual reconstruction nor a social-specific determination of commodity production. In *Forms Which Precede Capitalist Production*, Marx speaks of social formations where the productive attributes of society appear as the contingent aggregation of individual owners. However, this is an appearance: society as a whole determines the proportion of the general social product that corresponds to an individual according to particular social laws. The synthesizing of individually applied labor into social labor and the division of the sum-total of social-general capacity for labor and consumption into aliquot parts for each individual, is one of the decisive processes of the reproductive activity of any society and is the most fundamental and distinctive law of human natural history[17]. Value is the instantiation of that law in the *CMP*: in it the private character of concrete labor is socialized post festum through the mediation of commodity-exchange.

Besides general metabolism with nature and the *Gattungsprozess* through which individual productive and consumptive powers are sublated into social-generality through socialization in specific historical forms, the "morphological" principle of reproductive activity as

[16] Starosta 2022.
[17] Starosta 2022.

self-related, organized, bodily activity[18] must be counted as a principle of generic determinateness; it is the unity of the metabolic process in a manifold of productive faculties or organs that, in their archisynthesis, refer to the unity of society as a functional productive whole expressed by historically concrete laws, productive conditions, and relations of production and appropriation. Organs, when "posited as ideal" are not the empirical organs that constitute an empirical body but the principle of embodiment of a function: a partial purposive system in the organism. These end-directed, mutually presupposing, partial systems for human reproduction are production, distribution, circulation, and consumption. We think Marx understands these general (*allgemeine*) forms of production as Generic; as intensional determinations of the human species-being, that designate a form of *Lebensprozess* as distinctively human:

> Production creates the objects which correspond to the given needs; distribution divides them up according to social laws; exchange further parcels out the already divided shares in accord with individual needs; and finally, in consumption, the product steps outside this social movement and becomes a direct object and servant of individual need. – According to Marx: – Production [...] is always a determinate social organism, a social subject that acts within a totality [...] of branches of production."[19]

Every function is a means for another and exist as unified, vivified parts of a living process, regulating its metabolism with inorganic nature. But as "general and necessary" moments of the self-positing of such an organism, they are only thrown into actuality in concrete historical organs, in particular social forms simultaneously non-deducible by their natural-generic ground, and always-already made intelligible by the idea of the organic totality of the species the instantiate and actualize. Further, Marx adds:

> While in the completed bourgeois system every economic relation presupposes every other in its bourgeois economic form, and everything posited is thus also a presupposition, this is the case with every organic system. This organic system itself, as a totality, has its

[18] Hegel 1992.
[19] Marx & Engels 1983, p. 27; Marx 1993, p. 89.

> presuppositions, and its development to its totality consists precisely in subordinating all elements of society to itself, or in creating out of it the organs which it still lacks. This is historically how it becomes a totality.[20]

3.

According to the paragraph from the Grundrisse that I asked you to bear in mind, the CMP, while historically manifesting the same general productive and consumptive powers inherent in all human production, occupies an exceptional position compared to earlier social formations. The importance of this paradoxical situation is to suggest that the continuity between (1) and (2) ensures the material possibility of (3): "if we did not find concealed in society as it is the material conditions of production [...] and exchange for a classless society, then all attempts to explode it would be quixotic."[21]

The idea that the systematic synthesis of individual labor as socialized labor, is the exclusive hallmark of bourgeois society creates an insurmountable heterogeneity between (1) and (2), thereby denying that conscious revolutionary political activity (3) can be founded on the full development – complete universality and complete alienation – of generic social powers accomplished in (2). By reducing the universality of the determinations of Gattungswesen to the form of empirical "universality" by the CMP – where value-producing abstract labor becomes the "general social nexus" – it seems that any socialist political action must either abandon the aspiration for socialism or renounce the development of the social powers that manifest as alienated productive subjectivity under capitalism, i.e. lose the critical claim that (2) creates the conditions for (3).

A notion of *CMP* that breaks all solution of continuity between (1) and (2) sees the law of value as something other than an instantiation of the normative nature of the genus's life-process. As a law of social synthesis it is always-already an actualization of the powers of the species. And, by the same token, communism cannot be external to these immanent productive powers of the human genus. *Without this historical naturalism, the theoretical understanding of CMP and*

[20] Marx 1993, pp. 202, 278.
[21] Marx 1993, pp. 169, 102.

the necessity of its revolutionary supersession belong to two heterogeneous domains of thinking: one to the mere theoretical description; another to the ungrounded prescription of an abstract will. There would be no disposition of thought that allows us to articulate coherently the theory of capitalist society with its critique in a single gesture of thought. Marx's naturalism is a key aspect of the gesture through which the Critique of Political Economy qualifies its theoretical activity as immediately practical. How, then, can we understand the fact that the *CMP* is both an instantiation of general human powers and a historically revolutionary organization of these powers? Marx claims:

> It is not the unity of living and active humanity with the natural, inorganic conditions of their metabolic exchange with nature, and hence their appropriation of nature, which requires explanation or is the result of a historic process, but rather the separation between these inorganic conditions of human existence and this active existence, a separation which is completely posited only in the relation of wage labour and capital.[22]

Capitalism organizes, for the first time in history the capacity for labor as a social group entirely separated from the natural objectivity of labor. "Free from all objective existence"[23], this purely subjective labor power, organized as a class, confronts the objective conditions of production as its non-property, as values privately owned by others. Human labor power appears organized as a free labor market, *free* in four senses: dispossession and liberation from a) the instruments of labor, b) the land, c) the means of consumption, and d) relations of direct personal dependence.

This "free" labor, stripped of all objective determinacy (*Eigenschaftlos* and evacuated of Nature, its *laboratorium*), presupposes the mediated relation between the subjective labor power and its objectivity as the formation of a general-social circulating volume of commodities and money: "The objective body of activity happens in antithesis to the immediate labor capacity"[24]. For the first time in history, a concrete social totality shows in its particular social forms the generic dis-

[22] Marx & Engels 1983, p. 398; Marx 1993, p. 489.
[23] Marx 1993.
[24] Marx 1993, p. 873.

tinction between the *dinamei* labor capacity (subjective conditions) and the inorganic presuppositions (objective conditions) for its existence as two separate and antagonistic social entities:

> The bourgeois economists are so much cooped up within the notions belonging to a specific historic stage of social development that the necessity of the objectification of the powers of social labour appears to them as inseparable from the necessity of their alienation vis-a-vis living labour. But with the suspension of the immediate character of living labour, as merely individual, or as general merely internally or merely externally, with the positing of the activity of individuals as immediately general or social activity, the objective moments of production are stripped of this form of alienation; they are thereby posited as property, as the organic social body within which the individuals reproduce themselves as individuals, but as social individuals. The conditions which allow them to exist in this way in the reproduction of their life, in their productive life's process, have been posited only by the historic economic process itself; both the objective and the subjective conditions, which are only the two distinct forms of the same conditions.[25]

The synthesis of productive subjectivity (as living labor as a free market of labor) and the synthesis of the objectivity of production conditions (as Capital) confront each other as classes. The very terms of the organic syllogism are now historically presented as the antagonism between labor and Capital. The general organization of property as a synthesis of the non-objectivity of labor takes the form of a "subjectivity opposed to the worker" requiring a will, a consciousness, a collective capacity of appropriation and organization of the labor process, and thus, a personification: the capitalist. Thus, the generic act of appropriation between subjectivity and its inorganic nature is mediated by the labor market and private ownership of the means of production as social relations of production, just as the product of society's total labor finds its realization in the general capacity for consumption through the commodity form, and social relations of domination adopt a fully *verding*-lified, autonomous, and objective character, to the extent that individual subjects are constituted as the necessary and transitory masks of the objective social relations of the process of capital accumulation.

[25] Marx 1993, p. 832.

The exchange between private producers generates a tendency toward the development of a world market on which all individual subjects are directly dependent on the totality of the sphere of exchange in its greatest generality. The mediated form of socialization of labor products under their private labor form implies that "[...] the general bond and all-round interdependence in production and consumption increase together with the independence and indifference of the consumers and producers to one another." Therefore, "In the case of the world market, the connection of the individual with all, but at the same time also the independence of this connection from the individual, have developed to such a high level that the formation of the world market already at the same time contains the conditions for going beyond it."[26]

In the development of the world market, Marx observes the paroxysm of an absolute contradiction between the total formal independence of all private producers and the simultaneous, necessary global material dependence. This contradiction between the most achieved formal independence and the most achieved global material dependence expresses, in the form of capital, an alienated social intelligence: a global coordination of the productive and consumptive capacities of the species as an autonomous, independent body of "species-intelligence", separate from any personal intellect, and ingrained into every part of society as a system of petrified, unconscious thought. The material development of this general social intelligence on a global scale is the achievement of capitalism's revolutionary organization of humanity's productive faculties: an indirectly unified, global system of self-alienated purposes, for the first time rendering historically explicit through concrete social forms (the value-form) the fundamental law of the species' productive attributes: *that every individual power of production and consumption constitutes an aliquot part of the species' power of production and consumption.*

The mutual development of the alienation of the individual from their own capacities and from others – dominated by abstractions where they were once dominated by material relations of dependence and their subjection to the material stock of production conditions – also implies the accelerated development and tendency toward the universality and comprehensiveness of their relations and abilities.

[26] Marx & Engels 1983, p. 104.

Marx concludes:

> The specific form of formal and material contradiction within the process of social synthesis in Bourgeois society is the only one capable of producing 'the alienation of the individual from himself and from others, but also the universality and the comprehensiveness of his relations and capacities. In earlier stages of development the single individual seems to be developed more fully, because he has not yet worked out his relationships in their fullness, or erected them as independent social powers and relations opposite himself. It is as ridiculous to yearn for a return to that original fullness as it is to believe that with this complete emptiness history has come to a standstill.[27]

Human natural history can be presented in the three moments to which we have referred, if its decisive feature is the immanent historicity of the social-synthetic nexus and the degree of development and universality of the Generic powers of human metabolism; the continuous transformation of its organic and inorganic conditions of production, reaching its paroxysm in a totally alienated, antithetical, instantiation of these very powers. But what makes possible the unity of human natural history as the continuum of development of the scope of the forces of social labor is an immanent practical ideality: The yet imperfect realization of the genus as long as it does not display in its organic body the general consciousness of need, or the organization of need fully according to its immanent rational form, i.e. freedom. Marx's schematic presentation of natural human history is but a conception of the development of the species' powers through complete alienation and unfreedom as seeding the grounds for possible freedom: as a *Vorbereitungsgeschichte* for the full actualization of human generic determinations: human pre-history as the preparation for the society of freely associated individuals. Socialism, thus, implies the political organization of this intelligence over organic-natural metabolism by the global social capacity for labor, organized, until then, as a class.

Upon the idea of the organism rests the base for the material justification of the possibility of communism; the totality of social purposes should be seen as the totality of the false only to the extent that the real powers of social production have taken an alienated (*Entfremdet*)

[27] Marx & Engels 1983, p. 105.

form, as an alien objectivity, as the very synthesis of the unhuman, the unsocial, the external itself: second Nature. Mistaking labor in its historically devoid, naked, expropriated form for "labor" tout court and its immediately social character (or deploring the organization of a global and general system of social metabolism as pertaining only to the alienated social nexus of Capital) engages in a form of reification akin to luddism. Communism as the practical idea of possible humanity is not an abstract negation of actuality, but the theoretical discovery of an immanent axiological ground in the actual process of production and transformation of life through social labor. Socialism is, ultimately, the effort in human natural history to give these generic determinations – which manifest the inherently social character of labor and its conditions – a concrete form adequate to the rationality they immanently display, and to consciously express in their actuality the absolute end of humanity's metabolic activity: humanity itself, as self-conscious, and self-organizing non-natural nature.

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Charles Fourier's environmentalism in the pages of the Détérioration Matérielle de la Planète

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Abstract

This article aims to re-read a series of manuscripts by Charles Fourier (1772-1837), drafted between 1820 and 1821, published posthumously in 1847, and recently re-edited in France under the title *Détérioration Matérielle de la Planète* (Material Deterioration of the Planet). Fourier, living in an era of social transition marked by the Industrial Revolution, denounces the climatic catastrophe in a visionary and surreal way. He identifies the causes of climate change, conceived on the basis of a cooling of global temperatures, in anthropogenic action. The study focuses on the analysis of the *Détérioration* to grasp the specificity of the Fourierist critical-utopian system considering the contemporary debate on the Anthropocene.

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Keywords: Fourier, ecology, nature, passions, Utopia

Charles Fourier directed, with sarcasm and insight, sharp criticisms at the emerging capitalist society. He railed against the hypocritical and unjust nature of commerce, the rampant poverty, the exploitation and alienation of workers[1], sexual repression, and patriarchy[2]. In this

[1] For a detailed discussion of attractive work, see Massari R. (2022), *Charles Fourier e l'utopia societaria*, Roma: Massari Editore (chapter 2).

[2] For a detailed analysis of gender equality in Fourier, see Tundo L. (1991), *L'utopia di Fourier. In cammino verso armonia*, Bari: Dedalo (chapter 3).

paper, I will try to highlight how Fourier – beyond being a thinker rooted in the tradition of social utopia – can also be considered a proto-ecologist. One of the aims of the article is to read Fourier not in order to judge his relevance today, but to grasp a specific theme, his proto-environmentalism, in light of his critical-utopian system. To do this, I will return to the text, focusing on a series of manuscripts drafted between 1820 and 1821[3], first published in 1847 by the Fourierist journal *La Phalange* and recently (2022) collected in a single text titled *Détérioration Matérielle de la Planète*[4]. In this writing, Fourier denounces the climatic catastrophe, albeit in a visionary and at times surreal manner, and identifies its causes in anthropogenic action.

The drafting of the manuscripts that make up the *Détérioration* predates the publication of the *Traité de l'Association Domestique et Agricole*[5] (1822), Fourier's first major work, and, according to Jonathan Beecher, they constitute preparatory drafts for it[6]. The *Traité de l'Association* would be rewritten in 1841 under the title *Théorie de l'unité Universelle*. Fourier's interest in cosmogony and astronomical ideas would remain alive even in his later works, constituting, in Émile Lehouck's words, "an act of fidelity to the dreams and ambitions of his youth."[7]

Reading the *Détérioration* considering the current debate on the Anthropocene aims to show how a form of environmentalism, although immature and extravagant, was already present at the dawn of the workers' movement. Fourier wrote during a period of political,

[3] For the chronology of the manuscripts, see Schérer R. (1998), 'L'écosophie de Charles Fourier.' Revue des schizoanalyses, N°35, DOI: [https://www.persee.fr/doc/chime_0986-6035_1998_num_35_1_2260].

[4] Fourier C. (2022), *Détérioration matérielle de la planète,* Rennes: La Part Commune. The manuscript *Détérioration matérielle de la planète* is contained in *Cahier 11/9 Suppléments aux Prolégomènes, Extroduction: des transitions et dèsordres apparents de l'univers*, which is conserved at the Archives Nationales. In this work, I have used the version of the text published in France in 2022.

[5] The edition of Fourier's writings used and cited is the Œuvres Complètes, Anthropos, 12 vols., Paris 1966-68. Unless otherwise indicated, only the volume and page number are reported. The specific volumes correspond to the following works: Théorie des quatre mouvements et des destinées générales, I; Théorie de l'unité Universelle, II-V; Le nouveau monde industriel et sociétaire, VI; Le Nouveau Monde Amoureux, VII; La Fausse Industrie, VIII-IX; Manuscrits publiés par la Phalange, X-XII.

[6] Beecher 2008.

[7] Lehouck 1966, p. 157.

economic, and social transition: he lived through the French Revolution, the Napoleonic era, and the Restoration, and he was a critical observer of the profound social changes caused by the rise of the Industrial Revolution in France.[8]

The direct comparison with the pages of the *Détérioration* allows us to avoid the perspective error that – to use Beecher's words – consists of seeing the French philosopher as "an interesting but somewhat mad forerunner of healthier and deeper thinkers. By drawing distinctions between his 'acute insights' and his 'wild speculations,' historians have considered his ideas not in themselves, but in relation to subsequent intellectual systems – whether that be Marxism or Surrealism or Psychoanalysis."[9]

In Fourier's pages, the lucid and pioneering defense of the environment merges with extravagant and improbable cosmological theories. As Beecher states, "there is a close connection between the 'madness' of his cosmogony and the insights of his social critique. Both are radical assertions of humanity's power to shape its own limits and its own world. Both are rooted in the conviction that the only limit to our possibilities is our desire."[10]

1. *The natural order and the passional disorder*

The *Détérioration* opens with the affirmation that Passional Attraction, a concept Fourier claims as his principal discovery, is the factor that unifies humanity, the cosmos, and God. As we read in the *Théorie des quatre mouvements* (Theory of the Four Movements): "everything, from atoms up to the stars, constitutes a table of the properties of human passions. For example: Galaxies represent the properties of Friendship. Groups of solar planets represent the properties of Love. Groups of planetary satellites represent the properties of Paternity. Groups of suns or fixed stars represent the properties of Ambition."[11]

The unity and harmony of nature are conceived by Fourier – to use the words of Laura Tundo – "on the esoteric-analogical-mathematical structure of Keplerian cosmic harmony, on the systematization of the

[8] For the reconstruction of Fourier's biography, see Beecher 2008
[9] Paris 1966 p. 17.
[10] Paris 1966 p. 25.
[11] I, p. 32.

ontological-psychological concept of harmony realized by Leibniz, and on the Newtonian model."[12] The Fourierist idea of nature is the heir to a long tradition of Pythagorean origin that runs through European culture from Plato's *Timaeus* up to Renaissance Neo-Platonism and Kepler; to this tradition, he adds the dimensions of social critique and politics oriented toward utopianism. Fourier considers himself the inventor of a universal science[13]: a complement and development of the Newtonian law of gravitational attraction, capable of providing a total and organic explanation of the cosmos and resolving every social contradiction. The core of this science lies in the discoveries of passional attraction and universal analogy; through these concepts, it is possible, according to Fourier, to organize a harmonious society structured on the geometric composition of passions[14].

Passional Attraction is the motor of movement, and it is active in both human beings and matter. The Fourierist idea of nature does not postulate a split between matter and spirit, but their unity: human beings and nature are linked by an analogical and specular relationship[15]. Fourier identifies a series of hidden meanings and references in natural phenomena; he interprets nature, anticipating Charles Baudelaire's *Correspondances*, as "a forest of symbols." Consistent with this view, in the analogical table of the passions of the soul, Fourier associates a musical note, a color, a mathematical operation, a geometric shape, and a metal with each of the seven fundamental passions[16].

As we have seen, according to the French utopian, a universal analogy exists between the individual microcosm and the macrocosm; however, this harmony is undermined by the inconsistencies of *civilisation* (the unjust and repressive social order), thus creating an imbalance that is reflected in the breakdown of the climatic equilibrium, the increase in extreme climatic phenomena, and the interruption of the regular alternation of the seasons[17].

[12] Tundo 1991, p. 27.

[13] Fourier did not consider himself a philosopher, a category he despised, but an inventor. On this point, see I, pp. 191-193.

[14] I, p. 7.

[15] The medieval and Renaissance belief that everything in creation was reducible to a web of allegorical and symbolic relationships was still widespread at the end of the 18th century; for example, see Bernardin de Saint-Pierre's *Études de la nature* from 1784.

[16] II, 145.

[17] Fourier 2022, p. 19.

From this perspective, not only does the macrocosm affect individual destiny, but the social order also influences the natural order. Humanity is the mirror of the universe; however, when – as Tundo writes – "human passions are forced into a subversive, distorted, wicked development (*essor subversif*) (due to the repression suffered in inconsistent societies) they reflect this deviated development onto the universe, which Fourier identifies in 'harmful creations'"[18] and in the climate crisis.

2. *The disordered climate of a sick planet*

Fourier, based on the readings of Antoine-Alexis Cadet de Vaux, François Antoine Rauch, and Alexander Von Humboldt, observes that "the temperature quickly becomes spoiled, climatic extremes become habitual."[19] He interprets these climates changes based a global cooling of the planet. As evidence of how apparent these climatic alterations are, Fourier cites the difficulties in agricultural activities in certain European regions, including: the impossibility of cultivating oranges in Provence, the frosts that struck Nice for the first time in the winter of 1820, and the inability to cultivate vines in Namur[20]. The first decades of the 19th century constitute the concluding phases of the climatic phenomenon that climatologists call the "Little Ice Age."

For the Author of the *Détérioration*, the planet Earth is sick and suffers from the ills of *civilisation*. He identifies the causes in two main factors: productive inconsistency (linked to fragmented agricultural and industrial production) and sexual repression (due to gender oppression and the monogamous family). In Fourier's words: "it is undeniable that the prolongation of the social limbo causes rapid progress in climatic vices"[21] and for this reason, it is necessary to "remedy the material sufferings of the planet through the same operation that will put an end to human miseries."[22] The deterioration of climatic condi-

[18] Tundo 1991, p. 25. On harmful creations – the animals that nature, deformed by the long duration of the uncivilized stage, creates – see I, p. 55 and IV, pp. 254-255.

[19] Fourier 2022, p. 19.

[20] Paris 1966.

[21] Paris 1966.

[22] Paris 1966.

tions is connected to productive activities; therefore, it is impossible to solve environmental problems without questioning the productive system and the family structure that supports it[23].

The structure of the text in the *Détérioration* adopts a classificatory taxonomy[24]. The author lists the plagues afflicting the planet, proceeding from internal or "aromal"[25] scourges, which affect the Earth from its core to its epidermis (the Earth's crust)[26]; next, external or atmospheric scourges are analyzed[27]; and finally, the examination concludes with superficial or "cutaneous" scourges[28]. In the first class of environmental catastrophes, we find earthquakes and volcanic eruptions. Both natural phenomena are considered as the muscular movements of the planet. In particular, volcanic eruptions are seen, following an analogical explanation, as the suppuration of infected pustules on human skin, and they will cease when humanity and the Earth live in Harmony[29].

3. *The wind system and the Boreal Crown*

The external scourges concern the wind system, which Fourier calls the "eolian keyboard." (*Clavier éolien*).[30] The cold northern winds and hurricanes torment humanity in the lower social stages:

In the present it seems that some malignant genius has distributed all the winds [...] against our needs; and this must be so because the Aeolian keyboard, as God calculated it for Harmony, being the supreme perfection of the aerial instrument, is the judicious succession of all the great useful winds and all the pleasant zephyrs. It is necessary that the aerial instrument of the subversive epochs should fall, just like the terrestrial instrument, into all the vices opposite to the benefits that God has bestowed upon us, and that it should become, like

[23] See also IV, p. 99.

[24] On Fourier's taxonomic structure, see: Beecher J; Bienvenu R. (1971), The Utopian Vision of Charles Fourier, Boston: Beacon Press, pp. 37-39.

[25] By *aromal*, Fourier indicates a particular state of matter. On this point, see III, 248 and IV, 215.

[26] Fourier 2022, p. 26.

[27] Paris 1966 p. 30.

[28] Paris 1966 p. 46.

[29] Paris 1966 p. 27.

[30] Paris 1966 p. 31.

the animal and vegetable kingdom, a collection of filth and vexatious effects, in order to provide, according to the hieroglyphic unity [a web of references and correspondences inherent in the system of nature], a faithful image of the clash of subversive passions.[31]

In this perspective, the natural order is conceived as governed by a divine providence, wise and benevolent, which is corrupted only by the chaos of civilization. Climatic imbalances, plagues, and epidemics, caused by alterations of the atmosphere, are the symptoms of a passionate imbalance operating on a planetary scale.[32]

The atmospheric scourges "particularly afflict the health of the star"[33] and cause, in addition to epidemics, "the two extremes of a glacial atmosphere at the poles and a scorching one at the equator."[34] The cause of these two extreme climatic conditions is identified in the absence of the "Boreal Crown, which has the faculty of pumping heat from the equator to reflect it onto the poles and of cooling the central region through the same operation."[35] In this passage, we note that the inhospitable character of certain terrestrial regions is attributable to the poor health of the planet, which is no longer able to activate the atmospheric process that Fourier calls the "Boreal Crown" (*Anneau boréal*)[36]. The Boreal Crown is a ring, like that of Saturn, which, once restored, will encircle the planet not at the equator, but at the North Pole.[37]

Planet Earth is conceived of as a great animal. Fourier is the heir to a universal vitalism and animism; he believes that the planets and stars are living beings that are born, grow, and reproduce (through the exchange of aromal fluids)[38]. The Earth is a sick planet suffering from the ills of civilization. In Harmony, thanks to the Boreal Ring, nature will offer liberated humanity incredible wonders: cultivation extended to all latitudes, three annual harvests due to improved climate, melting of the polar ice caps and consequent purification of seawater[39],

[31] Paris 1966 p. 37.
[32] Paris 1966 p. 39.
[33] Paris 1966 p. 30.
[34] Paris 1966 p. 31.
[35] Paris 1966.
[36] On the Boreal Crown, see I, pp. 41-45.
[37] I, p.40.
[38] VI, p. 447.
[39] I, p. 45.

the appearance of new mineral, plant, and animal species useful and collaborative with humans[40]. In Fourier's theory, the Boreal Crown is responsible for one of the most imaginative and bizarre predictions: the transformation, once Harmony is reached, of marine bituminous liquid into lemonade[41]. It is interesting to note that, although Fourier writes at the dawn of the Industrial Revolution, he does not conceive progress in terms of technological development, but as a natural regeneration advantageous and aimed at human well-being.

4. *The future harmony between society and nature: the Phalanx*

Civilized humanity compromises the climate, but it possesses within itself the power to heal the planet. Fourier denounces the destructive power of human beings under the civilized regime, but he also recognizes their potential. He believes that it is possible to restore Harmony within the system of nature; this process implies a social and passionate architecture that reestablishes full unity on three fundamental levels: between humanity and God, within humankind, and between humanity and the cosmos[42]. In Fourier's utopia, the path leading from the subversive stage of civilization to Harmony can be realized through the creation of a series of model communities. These communities, structured according to the theory of passionate attraction, are based on a free and appealing labor process, are free from repressive morality and gender inequality, and are situated in a rural context. As Italo Calvino writes:

Compared to Saint-Simon, Fourier remains utterly untimely: lucid as he was in his critique of the present, he understood nothing of what was brewing. Both spoke of a "new industrial world", but the Anglophile Saint-Simon (a veteran of the American Revolution, no less) had his eyes open to a world that was far from utopian, whereas the Anglophobe Fourier staged a *kermesse* of cheerful cultivators, and in his examples, could only refer to horticulture and gardening, or to *ateliers* that were little more than artisanal workshops. This macroscopic error in perspective (or unconscious removal, or intentional determination to erase the rejected perspective from his view) was not

[40] IV, p. 254-255.
[41] I, p. 45.
[42] Fourier 2022, p. 45.

the only thing that made Fourier impractical. The anxiety to exhaust the universe pervades his unwieldy volumes, with their labyrinthine structure.[43]

The Phalanx is a pastoral and Arcadian utopia. Once restored, the Eolian keyboard (wind system) will provide humanity with moderate temperatures and three harvests per year. Moreover, the humanity of Harmony will witness the emergence of new plant and animal species useful to humans, which will counteract harmful and dangerous animal species: "all animals offensive to humans and their servants, from the crocodile to the flea, will see their antithesis [*antiphatique*] arise, from which they will be annihilated. The harmonious creations must operate in full contrast with the subversive ones, of which only the useful subjects – horse, ox, sheep, etc. – will be preserved, along with those that are harmless and pleasant, such as deer, roe deer, etc."[44]

For Fourier, the natural order is providential and oriented toward human well-being, but this order is not given immediately and definitively. Providence is not limited to arranging the natural order; it also has a social dimension[45]. Creation, under the divine plan, is a continuous work, conditioned by greater or lesser passional freedom[46]. Nature is intrinsically benign, provided that humanity respects it, mirroring it in the social organization, which in turn is the reflection of the passional code. Furthermore, the Fourierist utopia is not framed by Promethean industrialism, but, as we see through the reference to the status of animality, by a weak anthropocentrism, as it is mitigated by universal animism.

5. *Individual interest and collective interest*

The last class of scourges affecting the Earth and humanity concerns the planet's skin, that is, the Earth's crust. Among the cutaneous plagues are intensive deforestation of forests[47], desertification, floods, and soil depletion[48]. These phenomena are directly linked to

[43] Fourier 1971.
[44] Fourier 2022, pp. 43-44.
[45] Paris 1966 p. 78.
[46] IV, p. 264.
[47] Fourier attributes great importance to deforestation and cites the studies of F.A. Rauch.
[48] Fourier 2022, p. 47.

the agricultural production activities of the anarchic and fragmented economy, which is based on the patriarchal and monogamous family. René Schérer writes that Fourier:

He has perfectly understood that the study of humanity is inseparable from that of nature and that the current state of nature engages human responsibility [...]. It is therefore appropriate to add to natural ecology a social ecology based on the mechanism of association, rather than on the anarchic and selfish fragmentation of families. Social ecology, on a strictly human level, is labor restored to its function as an exercise of passions and to its true purpose of producing wealth for the benefit of the workers themselves.[49]

In the concluding part of the text on the *Détérioration*, environmental and climatic catastrophes are interpreted in terms of the irreconcilability between individual and collective interest typical of civilized society[50]. The predatory and extractive nature of *civilisation* is described in the following terms: "It is therefore completely ridiculous to issue decrees that command civilization to cease being itself, to change its destructive nature, to stifle its rapacious spirit, always inclined, in agriculture as in finance, to devour the future, to kill the hen to obtain the eggs. This is the spirit of civilization and of societies of incoherent order."[51]

6. *Conclusion*

Reading Fourier in the Anthropocene, from my point of view, is useful because, as Calvino writes, "he continues to function as a device to test our ability to think and 'see' the freedom of all, to give meaning and rigor to an unlimited representation of our desires. It seems that Fourier was driven to mix social organization and 'astral copulations' in his pages to prevent his words from being understood in a normative sense."[52] The labyrinthine, poetic, imaginative, and cumbersome system that emerges from his writings functions as a mechanism for envisioning humanity freed from alienated labor, gender oppression, and in harmony with nature. In this framework, he

[49] Schérer 1998, p. 133.
[50] Fourier 2022, p. 54.
[51] Paris 1966 pp. 64-65.
[52] Calvino 1971.

represents the symptom of a romantic, utopian, and surreal resistance to the emerging capitalist society, its social inequities, and its environmental catastrophes. For this reason, Fourier's ideas invite us to reflect on the triad – central in the Anthropocene – of production, science, and society. Reading Fourier and his boundless need for utopia allows us to resolve and overcome, through imagination, the Capitalocene and capitalist realism.

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Second Section

Marxism

Theodor W. Adorno's Concept of Natural History and the Climate Crisis

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Abstract

Theodor W. Adorno's concept of natural history provides valuable resources for a critical theorization of 'things', including those that make up the external, natural environment. The concept of external nature here derives immanently from a materialist analysis of society rather than being uncritically delegated to the natural sciences, as is the case in scientifically realist Eco-Marxist approaches. The key to an ecological reading of Adorno is his negative ontology, which allows us to address first, external nature without invisibilizing the dualist second nature of identifying thought. Adorno's relevance amid accelerating climate and environmental breakdown is demonstrated through an Adornian critique of both scientific and political realism.

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1. *Why Adorno?*

Theodor W. Adorno died in 1969 before the beginning of the first environmental movements. So how can his thought possibly be relevant to dealing with the climate and environmental crises? My general answer to this question – the concrete answer will be elaborated in what

follows – relates to Adorno's understanding of the role that philosophy in the shape of Critical Theory can play in society: Whenever and wherever society is overly optimistic and excited about 'progress', the Critical Theorist soberly cautions and points out the blind spots created by this excitement. Whenever and wherever society despairs because of past, present or expected suffering, the Critical Theorist looks for small but effective moments of hope and even optimism. For example, in a passage of *Negative Dialectics* that appears to be referring to the nuclear arms race, Adorno writes that "[e]ven the steps which society takes to exterminate itself are at the same time absurd acts of unleashed self-preservation directed against suffering"[1]. Critical Theory, in other words, steps in precisely where it seems most untimely – where reality appears fixed and unquestionable – and challenges the dogmatic realism that insists the world can only be as it currently is.

In the final aphorism of *Minima Moralia* entitled "Zum Ende" (*at the end*) that can be read as both referring to the end of the book and hinting at the looming end of humanity, Adorno writes:

"The only philosophy which can be responsibly practiced in face of despair is the attempt to contemplate all things as they would present themselves from the standpoint of redemption"[2].

The topicality of Adorno in the 21st century derives then from his challenge to create perspectives that neither fall into doomsday-'realism' nor into naïve utopianism that somehow 'all will be well'. More specifically, notice the role *things* play in this final aphorism. The neither realist nor utopian perspectives that Critical Theorists are tasked to create and that will "displace and estrange the world"[3] derive from a contemplation of how the '*things* would present themselves from the standpoint of redemption'. The Critical Theorist derives such displacing and estranging perspectives not by violence or wishful (in the insincere sense) thinking, but "entirely from felt contact with its objects (*ganz aus der Fühlung mit den Gegenständen heraus*)"[4].

In the following, I want to defend the topicality of Adorno's concept of natural history in the context of the climate crisis. Natural history thereby serves as the larger theoretical frame, within which Adorno the-

[1] Adorno, T.W. 1966. *Negative Dialektik*, 203. Translation DB. All of the following quotes are my own translations from the original German.

[2] Adorno, T.W. 1951. *Minima Moralia*, 247.

[3] T.W. 1951.

[4] T.W. 1951.

orizes *things* – amongst which Adorno also counts those that make up the natural environment –, how they are being dominated and the role they play in overcoming this domination.[5] Chapter 1 elaborates how Adorno theorizes things and the domination of things as the objects of reified experience. Chapter 2 presents the tools that Adorno develops for a self-reflexive mode of thinking that seeks to escape its own reification. Finally, the conclusion links these arguments to the climate crisis and develops an Adornian critique of scientific and political realism.

2. *What is a thing?*

To answer the question how Adorno theorizes 'things' we need to take a small detour to Adorno's overarching critical concept of natural history (*Naturgeschichte*), which the young Adorno introduced in his 1932 talk at the Kant Society of Frankfurt "The Idea of Natural History" and which the late Adorno – loyal to himself – cites again in his 1966 *Negative Dialectics*. What 'natural history' aims to accomplish is twofold:

> to comprehend historical being in its most extreme historical determinacy, where it is most historical, as nature-like being, or if it were possible to comprehend nature as an historical being where it appears to rest most deeply in itself as nature[6].

This chapter takes up the first of the two complementary theses that 'historical being must be understood as nature-like being' (*naturhaftes Sein*). The next chapter will continue with the second thesis that 'nature must be comprehended as historical'.

[5] The focus of this paper is on external nature and – due to space limitations – leaves out the discussion on internal nature (sensuousness, drives, the unconscious) as well as the relation of the two. With the privileged focus on external nature the present paper aims to intervene in the controversial debate around the topicality of Critical Theory on ecological matters. Cfr. Gregoratto, F. et al. 2022. „Critical Naturalism: A Manifesto", Cassegård, C. 2021. *Toward a Critical Theory of Nature*, Cook, D. 2014. *Adorno on nature* or Görg, C. 2011. "Societal Relationships with Nature" who defend the topicality versus Favier, K. 2023. „Materialism in the Anthropocene" who fervently criticizes the topicality.

[6] Adorno, T.W. 1932. *Die Idee der Naturgeschichte*, 254-355. Emphasis omitted DB. My translation of this sentence takes Philip Hogh's crucial comment into account that the German "naturhaft" should be translated as "nature-like" and not – as in Hullet-Kentor's translation – as "natural". Cfr. Hogh, P. 2023. „Negative Dialektik der Naturgeschichte".

3. *History is nature-like*

Adorno's claim that what appears as historical is actually nature-like draws on a concept of second nature as Hegel draws on in his *Elements of the Philosophy of Right*[7] and as Marx critically develops further in *Capital Volume 1*[8]. Essentially, Adorno challenges us to think of capitalism as a system that *appears* as one without alternative – for instance by *apparently* deriving from human nature. The idea that 'capitalism is natural' is what Adorno calls an *ideology* in the sense of a 'socially necessary illusion' (*gesellschaftlich notwendiger Schein*). Ideology, understood in this way, is (A) a false idea that (B) plays an important role in reproducing capitalism and that in order to successfully reproduce capitalism must appear as true. Therefore, the idea that 'capitalism is natural' is descriptively both true and false.[9]

What applies to bourgeois (capitalist) society as a whole also applies to the *thinking* of the subjects of bourgeois society: it is structurally false *and* appears as unquestionably true. What is false about bourgeois subjects' thinking and how does it become false? Following Lukács' theory of reification[10], Adorno argues that thinking in each given society reflects the prevailing mode of production. The essential characteristic of false thinking under the capitalist mode of production is the identification of concept and object. This is why Adorno refers to false thinking also as 'identifying' thinking (*identifizierendes Denken)* or as 'conceptual' thinking (*begriffliches Denken*). From the "universal domination of exchange value over humans"[11] derives the domination of concepts over their objects. As Marx analyzes in the chapter on the commodity form in *Capital Volume 1*, the exchange value abstracts from the particularity of a thing, i.e. its use value. Qualitatively different things are put into a relation of equality (i.e. identity) based on a commonality that is alien to them, the commodity form. This, according to Adorno, is reflected in the socially necessary identification of the concept and its object.

[7] Hegel, G.F.W. 1820. *Grundlinien der Philosophie des Rechts*, especially §4, §151. Cfr. ND, 48. Cfr. Adorno, T.W. 1966. *Negative Dialektik*, 349-50.

[8] Marx, K. 1867. *Das Kapital Band I*, 649. Cfr. Adorno, T.W. 1966. *Negative Dialektik*, 347-348.

[9] Adorno, T.W. 1964/65. *Zur Lehr von der Geschichte und von der Freiheit*, 170, 348, 351; Cf. Jaeggi, R. 2009. „Was ist Ideologiekritik?", especially 272-284.

[10] Lukács, G. 1923. „Die Verdinglichung und das Bewusstsein des Proletariats".

[11] Adorno, T.W. 1966. *Negative Dialektik*, 180.

4. *On subject and object*

What is wrong about the identification of concept and object? For concept and object to be identified, they first need to be regarded as separate from one another. The identification of concept and object thus implies a dualism between the thinking subject and the thought object. This dualism denies that in reality subject and object are not dualistically separate, but mutually mediated through one another: "object through subject, more still and differently subject through object"[12].

Thinking cannot recognize the object directly, but only mediated through itself. How the object is mediated through the subject is something that Adorno explains *with* Kant. The thing-in-itself in Kant's analysis in *Critique of Pure Reason* is unattainable for thinking: it can only ever be thought as mediated. The thought thing thus reflects the a priori enabling conditions of thought itself. *Against* Kant, Adorno wants to save the thing-in-itself from its dissolution into the subject. As a materialist, Adorno views the subject as situated in the material world through labor.[13] Even if human thinking is profoundly corrupted by the capitalist organization of labor, it is nonetheless directed towards material existence: "The thought is not an image of the thing […] but goes towards [or aims at] the thing itself" (*der Gedanke geht auf die Sache selbst*)[14].

5. *The domination of things through thought*

A thing, in Adorno's terms, is therefore that towards which every thought goes and at the same it is that which hides behind thought's concepts as "terminological masks"[15]. A thing is that which thought wants to 'give itself to', but at the same time is conditioned to dominate: "If thought really expressed itself to the thing, if it applied to *it*, not to its category, then the object itself would begin to speak under

[12] Adorno, T.W. 1977. „Zu Subjekt und Objekt", 742.

[13] This is where Adorno's student, Alfred Schmidt, deserves mention. Schmidt's (1962) dissertation on *The Concept of Nature in Marx*, which Adorno not only co-supervised together with Max Horkheimer, but which Adorno also cites several times in *Negative Dialectics*, elaborates on this point.

[14] Adorno, T.W. 1966. *Negative Dialektik*, 205.

[15] Adorno, T.W. 1966. *Negative Dialektik*, 193.

the lingering gaze of thought"[16]. What prevents the realization of this "cognitive utopia" (*Utopie der Erkenntnis*)[17]? How exactly is thinking dominating (*herrschaftsförmig*)? And how can this domination be overcome?

According to Adorno, things are being dominated as the objects of 'conceptual' or 'identifying' thinking. This domination consists of two steps. In a first step, thinking misunderstands itself as separate from the objects of its thinking. As objects, things appear as the subject's 'other'. In a second step, thinking falsely identifies (in the sense of 'equates') its concepts with these now-objects. The second step covers up the first: The thought of a tree appears to be concerned with the tree, while in fact it is concerned with the tree-as-object. In this way, even an environmentalist discourse surrounding trees can reproduce a false, dualist thinking. Thinking dualistically, following Adorno, is not *per se* reprehensible as it follows from the prevailing mode of production and as this mode of production cannot be overcome by thought. What thought *can* do, however, is become self-reflexively aware of its own dualism. Rather than invisibilizing the dualism by pretending that the concept of a tree is a good enough representation of the tree and thereby turning the dualism into a hierarchy (this in essence is Adorno's critique of scientific positivism[18]), thought can take on a specific posture (*Haltung*) both towards the things and towards itself – the posture of the Critical Theorist – out of which perspectives can be created that might be able to displace and estrange socially necessary illusions.

6. *How to stop dominating things?*

Thinking cannot immediately free itself from the false, dualistic experience of reality. But what it can do is become self-reflexively aware of its necessary falseness – and thereby 'point towards' a way of thinking that does not violate its objects. Under the given mode of production, thought cannot realize this non-violent, cognitive utopia, but it can keep its possibility and desirability in mind. To this end, Adorno outlines two heuristics that are intended to help false think-

[16] T.W. 1966, 38.
[17] T.W. 1966, 21.
[18] Adorno, T.W. et al. 1969. *Der Positivismusstreit in der deutschen Soziologie*.

ing to recognize its not yet overcome falseness: The primacy of the object (*Vorrang des Objekts*) and the non-identical (*das Nicht-Identische*). Together they amount to what we can call a negative ontology, borrowing this term from Adorno's student Alfred Schmidt.[19]

7. *Primacy of the object*

The object does not have absolute primacy in itself, but only *relative* to the ideological standpoint of false thinking. Assuming a primacy of the object is the best possible attempt of false thinking to "contemplate all things as they would present themselves from the standpoint of redemption"[20]. The primacy of the object attempts to call out the false subject-object dualism that is invisibilized by a false primacy of the *subject*, i.e. of thought. In a remarkable passage of *Negative Dialectics*, Adorno refers to the kind of self-reflexive thinking he aims to outline as one driven by a "love towards things"[21]. As a heuristic that wants to break false thinking without being able to formulate a blueprint for the 'cognitive utopia' of non-dominating thinking, the primacy of the object can be understood as Adorno's *love letter* to the things, i.e. to that which lies behind the conceptual masks and which even self-reflexive thinking cannot yet grasp without violence. The primacy of the object is a *temporary* heuristic, because ultimately the goal is neither a primacy of the object nor of the subject, but no hierarchy altogether.[22]

8. *The non-identical*

What conceptual, identifying thought refers to as the 'object' is non-identical with its concept, it does not merge with it. In other words, the so-called 'object' eludes the concept's attempt at subjugation. The

[19] In their assessment of Schmidt's dissertation on Marx' concept of nature where the term 'negative ontology' first appears, Adorno and Horkheimer take up this term affirmatively. Although to my knowledge Adorno doesn't use the term himself in any of his published works, I consider it helpful to understand the way Adorno thought of the external environment. Cfr. Adorno, T.W. & Horkheimer, M. 1962. „Version 2a des ‚Gutachten'".

[20] Adorno, T.W. 1951. *Minima Moralia*, 247.

[21] Adorno, T.W. 1966. *Negative Dialektik*, 191.

[22] Cfr. Adorno, T.W. 1966. *Negative Dialektik*, 182.

non-identical refers to this 'withdrawal' of a thing from its concept or object-ness. The non-identical is therefore not a thing itself (a non-conceptual object, for example), but the relationship between the concept and the subjugated thing-as-object. The non-identical harbors the impossibility of total subjugation. In the 'cognitive utopia' (*Utopie der Erkenntnis*) thought would not any longer create non-identity.

9. *Negative ontology*

Taken together, the primacy of the object and the non-identical enable a way to talk about the things of first nature without essentializing them, without falling into the hubris of positive ontology. Following this negative ontology, our practical interaction with, say, a tree, could be imagined like this:

Hello tree. The objective structure of the society I am a subject of has conditioned me to call you a tree. I have been conditioned to believe that my concept of you and you are separable. By referring to you as a tree I am identifying you with a kind of concept that denies the inseparability or mutual mediatedness between you and my concept of you. Through this denial I am inevitably violating you. I may paint pictures of you, protect you against being cut down or hug you – but none of these things have the power to change the dominating structure, the historical apriori, of how you appear in my cognition. As the structure of my cognition follows from the mode of production of the society, I am subject of, only a change of this mode of production could change the structure of my cognition. What I can do before this change of the mode of production is brought about, however, is acknowledge what I just described: You are not what you appear to be. And still, I can only live and reproduce myself by interacting and at times even struggling with you, planting you, watering you, eating your fruits for my nourishment and at times also cutting you down to pre-empt the spread of forest fires. The challenge for me, amidst all this very real need to secure my life with and against you, is to keep in mind that 'you' – whoever you are – are not who you appear to be. 'You' are the tree 'as it will present itself from the standpoint of redemption'[23]. 'You' are non-identical with my concept of you as tree.

[23] Adorno, T.W. 1951. *Minima Moralia*, 247.

This, I believe, is what Adorno has in mind when he presents the "problem" of natural history as "[...] recognizing and interpreting the alienated, thing-like, dead world"[24]. All trees are already dead. The solution to this problem, Adorno calls philosophy as interpretation (*Deutung*). Introduced by Lukács' as a "metaphysical act of resurrection"[25], Adorno takes up this procedure in a "secularized" form that he sees accomplished by Walter Benjamin[26]. To understand how this procedure works, let us turn to the second thesis of natural history.

10. *Nature is historical*

According to the first of two theses of natural history from chapter 1, historical being had to be interpreted as nature-like being. The second thesis, now, challenges us to interpret nature as historical. In the above, negative-ontological exercise, this was done when 'tree' was interpreted as the product of a certain form of socialization. The social deconstruction of 'tree' did not refer to the convention of naming a tree 'tree', but to the underlying dualist concept-object structure within which all cognized 'objects' 'naturally' appear.

What is still missing from the reconstruction of Adorno's concept of natural history thus far are the "things as they would present themselves from the standpoint of redemption"[27]. In another formulation, Adorno writes about the second thesis of natural history as the "procedure" (*Verfahren*) to "make nature dialectical under the sign of history" (*die Natur im Zeichen der Geschichte dialektisch machen*)[28]. The point here is to interpret what appears as nature not just under the sign of what history *has been* (social deconstruction), but also under the sign of what history *could be* and promises to be. The key to making nature dialectical is the speculative creation of perspectives by way of a kind of thinking that is just as harsh against its own subjugating second nature as it is sensitive, tender and loving towards that which it subjugates: things.

[24] Adorno, T.W. 1932. *Die Idee der Naturgeschichte*, 356.

[25] Lukács, G. 1916. *Theorie des Romans*, 55. Cfr. Adorno, T.W. 1932. *Die Idee der Naturgeschichte*, 357.

[26] Benjamin, W. 1928. *Ursprung des deutschen Trauerspiels*. Cfr. Adorno, T.W. 1932. *Die Idee der Naturgeschichte*, 357.

[27] Adorno, T.W. 1951. *Minima Moralia*, 247.

[28] Adorno, T.W. 1932. *Die Idee der Naturgeschichte*, 360.

11. *Conclusion: Adorno's critique of scientific and political realism*

If Adorno is right in his analysis that the ills of capitalist society are ultimately interconnected with a dualist subject-object relation in the form of dominating conceptual thought, then Adorno's relevance in the climate crisis consists in a critique of the kind of scientifically realist approach to external nature that invisibilizes this subject-object dualism. Practically, the discourse around scientific facts about certain 'objects' like 'the atmosphere' or 'carbon dioxide molecules' must be accompanied by a sincere, self-reflexive posture to counteract the hubris that is inherent in unreflective 'objective' descriptions of reality.

Objectivity in the climate crisis is both our best shot at grasping the climatic consequences of fossil fueled capitalism *and* part and parcel of how capitalism reproduces itself. This is a contradiction that cannot be resolved by thought itself. It is a contradiction that thought needs to grasp as necessary given the current mode of production. Between the scientific realism defended by Foster, Saito and Fraser[29] and the crushing critique of the natural science by Carolyn Merchant[30], Adorno challenges us to endure the contradictory thought that the objectification of nature is both true and false, both without alternative and desperately in need of one.

In a letter, Max Horkheimer intuitively uses quotation marks around the word "air" when describing a 19th century production plant, because the air in the factory is not fit for workers to breath. In quite the same fashion, when including scientific terms and facts in a critique of society, these terms – from "bios" (ancient Greek for 'life') to "biodiversity" – must be understood as placeholders. Placeholders not for a past, once healthy nature that needs to be restored, and also not because the natural sciences are *absolutely* false, but placeholders as signs, as ciphers and riddles for a heterogenous diversity that we are currently still unable to recognize and identify with. For the real nature, "as it stirs mortally and tenderly in its beauty" – and to which Adorno attaches the hope of a society free from domination and suffering – "does not yet exist"[31].

[29] Foster, J.B. 2000. *Marx's Ecology*, 2; Saito, K. 2016. *Natur gegen Kapital*, 94; Fraser, N. 2023. *Cannibal Capitalism*, 90-92, 175-6 fn 3.

[30] Merchant, C. 1980. *The Death of Nature*.

[31] Adorno, T.W. 1970. *Ästhetische Theorie*, 115.

This Adornian critique of scientific realism is mirrored in the critique of political realism, with which the paper began: Just as Adorno doesn't discard scientific realism, but situates it as a socially necessary illusion within capitalism, so, too, Adorno does with political realism. The political question at hand is whether a radically free, post-capitalist society is still possible despite the 'reality' of the irreparable damages to the climate and ecological systems that already took place. The political realist would say 'no' – and thereby justify 'unfortunate, but necessary injustices' by way of managing the increasing resource scarcity induced by climate breakdown.[32] With Adorno we can remind the political realist that any scenario short of human extinction will always be subject to philosophical interpretation. With increasing scarcity what will also increase is humanity's need for perspectives that resists the nature-like closing of radical futures to what the IPCC calls "development pathways". Adorno's topicality then is that of a thinker who is 'crazy' enough to still believe in the possibility of 'a paradise built in hell' (Rebecca Solnit) or more soberly of a 'half-earth socialism' (Troy Vettese and Drew Pendergrass).[33]

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[32] As could be observed in the covid-pandemic where people with lower income and wealth, women, migrant workers and children were amongst the demographic groups that suffered tremendously more than the average.

[33] Solnit, R. 2009. *A Paradise Built in Hell.* Vettese, T., & Pendergrass, D. 2022. *Half-Earth Socialism*.

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The body of the worker and the body of the city

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Abstract

This contribution examines the contemporary city as a biopolitical machine, where power is exerted through logistic rationality. Logistics governs urban life by acting on bodies, substratum of labour-power, and shapes the city by means of the infrastructures which traverse it. As a consequence, it becomes impossible to describe the city as a well-defined form. Logistic rationality operates as a 'real abstraction' that produces concrete effects on the lives of the urban proletariat.

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Keywords: city, logistics, living labour, biopolitics, real abstraction

1. *Introduction*

My contribution aims to describe the contemporary city as a biopolitical machine. For bio-political machine I intend two questions.

The first one: within the urban space, the political power exceeds the State form and now coincides with the logistical rationality that puts in form the social dimension.

The second one: logistics is concerned with human life and the bodies of city dwellers, because these bodies are the substratum of the 'labour-power', namely the totality of physical and intellectual aptitudes existing in the human corporeity. The *bios* acquires specific

importance in the capitalist society because the worker's life contains a generic capacity to produce (the labour-power) that allows the production of surplus value.

In general terms, logistics refers to the whole set of tools, infrastructures, means of transport, and information which make up the material dimension of globalization. In concrete terms, logistics functions as a form of governance and disciplining of labour-power.

In the first part, I argue that, with the development of the process of industrialization, it becomes impossible to describe the 'city' as a well-defined form. It depends on the fact that its materiality, the 'body' of the city, coincides with the network of infrastructures which traverse it. In the second part, I propose to describe the form of power established by logistical rationality as a "real abstraction". A type of rationality that produces significant effects on the life of the urban proletariat.

2. *The body of the city as infrastructure*

It's symptomatic that, investigating Karl Marx's reflection, there isn't a specific reflection about the city. The city, for Marx, has a historical significance[1]. In the *German Ideology*, he describes the antagonism between medieval city and countryside as a process of expansion of the bourgeois power over feudal power. The reflection on the city is situated within the broader context of the division of labour. The separation between industrial and commercial labour on the one hand and agricultural labour on the other leads to 'the separation of town and country and to the conflict of their interests'[2].

The prominence of urban over the countryside is the starting point of a new history, in which industrialization and urbanization are strictly connected.

With the rise of the urban dimension, mobile capital asserts itself on a global scale. At this point, it is no longer possible to establish a dialectic between industrial city and countryside. The city and its surrounding territory, the inside and the outside, are integrated within

[1] Cuppini N. (2022), 'The City as a Time-Machine. Marx and Urban Transformations', in M. Battistini, E. Cappuccilli, M. Ricciardi (eds.), Global Marx. History and Critique of the Social Movement in the World Market, Leiden: Brill, pp. 74-90.

[2] Marx 1998, p. 38.

a totalizing system. The territorial spread of capital not only signals the end of the city/countryside antagonism, but also marks the global generalization of capitalist production, in which physical infrastructures (such as bridges, flumes, railways) play a fundamental role[3].

Marx does not treat the "city" as a specific object of his research because the division of labour and the division into social classes fuel a new kind of conflict that goes beyond the dialectical opposition between city and countryside. The industrial city cannot be understood without considering the global market, but, above all, without considering the new form of social antagonism:

> In the sphere of agriculture, large-scale industry has a more revolutionary effect than elsewhere, for the reason that it annihilates the bulwark of the old society, the ' peasant', and substitutes for him the wage-labourer. Thus the need for social transformation, and the antagonism of the classes, reaches the same level in the countryside as it has attained in the towns[4].

City and countryside are united by a common condition of exploitation articulated on a global scale. Cities are traversed by complex infrastructural networks that colonize territory and unfold across the entire planet, making it impossible to distinguish what is 'inside' from what is 'outside' the city. The urban space can no longer be described as a 'form' enclosable and delimited: his materiality, the 'body' of the city, coincides now with the set of infrastructures which cross it.

With the logistics revolution of the 1960s[5], logistics became a 'form' of power within urban space, with its own logic capable of organizing the labour-power, influencing political power, re-shaping territorial limits. To grasp this aspect, it is essential to consider the

[3] 'While capital must strive on the one hand to tear down every local barrier to traffic, i.e. to exchange, and to conquer the whole world as its market, it strives on the other hand to annihilate space by means of time, i.e. to reduce to a minimum the time required for the movement [of products] from one place to another. The more capital has been developed, and the greater therefore the expansion of the market in which it circulates, which constitutes the spatial path of its circulation, the more it goes on to strive for an even greater spatial expansion of the market and for a more complete annihilation of space by means of time'. Marx K. (2010), Marx 1857-1861. Vol. 28 in MECW, Lawrence & Wishart Electric Book, p. 463.

[4] Marx 1976, p. 637.

[5] Allen 1997, pp. 106-16.

transformations in Fordist industry. During the Fordist era, the factory was not only the fundamental hub of production, but also became the core of political revendication by the working class, which managed to achieve important social gains by the late 1970s.

The reaction of capital has been to relocate production on a global scale. The high concentration of machines and labour within the factory has been dispersed across the territory, leading to an expansion of urbanization forms and interconnected global stages of production that were previously concentrated in a single site. At the same time, logistics has enabled the global mobility of the factory-form, thereby generating a new global structuring of the world market. In other words, we have witnessed an 'industrialization of circulation', a domain that was previously primarily commercial. Circulation now directly enters productive processes: circulation implies not only the mobility of finished goods, but also the interconnection of the individual stages of production. The so-called 'supply chains' encompass multiple companies, each handling specific stages of the production cycle, producing an order that emerges through the integration of systems which are not necessarily homogeneous[6].

The entire territory becomes a vast 'factory without walls'[7]. What

[6] The so-called "logistics revolution" transforms the production process in a 'transnational' sense, establishing relationships whose logic exceeds that of modern sovereignty. Territorial boundaries are not erased, but are reinscribed within global production processes; consequently, borders can no longer be regarded as the exclusive domain of states' political power. The transnational character of production creates connections between different political and legal entities, disrupting traditional political geographies through the formation of infrastructural zones and corridors, which intertwine with existing institutional structures, contributing to their transformation. See Grappi G. (2016), Logistica. Rome: Ediesse.Infrastructural corridors constitute 'special administrative zones', that is, power structures that operate under legal conditions detached from the State regulatory framework. These are governance structures that involve activities often eccentric to the system of political representation upon which modern political sovereignty has been founded and legitimized. In the context of this transnational production process, the State reveals its 'insufficiency': infrastructural corridors 'do' politics, challenging the State's privileged position as the sole legitimate political actor. See Easterling K. (2014). Extrastatecraft. The Power of Infrastructure Space, London-Brooklyn: Verso and Ricciardi M. (2013), 'Dallo Stato Moderno allo Stato globale. Storia e trasformazione di un concetto', Scienza & Politica, Vol. 25 (48), pp. 1-19. DOI: https://doi.org/10.6092/issn.1825-9618/3891.

[7] Ashton B. (2006), *Factory without walls*, Retrieved October 30, 2025 from

we call metropolis, indicating a departure from the idea of traditional city, points out the expansion of the factory across the territory[8]. However, as will be discussed in the next paragraph, this produces a paradox. On the one hand, abstract labour and the wage relation also encompass forms of work that take place outside the factory, throughout urban space. On the other hand, these new forms of work cannot be regimented according to a uniform, abstract measure of labour time.

For the moment, we mean to emphasize that it would be a mistake to conceive logistics merely as a system for locating and connecting diverse firms and labour forces on the basis of cost or other parameters. Logistics tends to organize space and to produce specific 'worlds': "logistics is not just about circulating *stuff* but sustaining life"[9].

3. *Urban space as a real abstraction*

Logistics functions as an apparatus for capturing and organising human life in its entirety. In Marxian terms, organising life entails organising living labour, the basis of surplus value production. The *bios*, the life of the worker, acquires a specific importance in capitalist society because it contains a generic capacity to produce, labour-power, which enables the production of surplus value[10]. However, this generic productive capacity is, in itself, irrational and incalculable. Above all, this capacity can coincide with the worker's desire for emancipation from capital[11].

The fact that logistics operates as a form of power is also evident for Friedrich Engels, who describes the 'Haussmann method' after the 1848 uprisings in Paris. Haussmann's functionalist architecture exemplifies a 'becoming-infrastructure' or 'becoming-logistics' of political power[12]: it represented an urban-planning strategy explicitly oriented toward political objectives of social stabilisation, enforcing a new urban order and shielding the city from civil war. This poses the

https://www.metamute.org/editorial/articles/logistics-and-factory-without-walls.

[8] Aureli P.V. (2016), *Il ritorno della fabbrica. Appunti su territorio, architettura, operai e capitale*, Retrieved October 30, 2025 from https://operavivamagazine.org/il-ritorno-della-fabbrica/.

[9] Cowen 2014, p. 3.

[10] Virno 2004, p. 82.

[11] Tronti 2019.

[12] Cuppini 2023.

following problem: how can we think together the rational (urban planning) and the irrational (the excess of potentialities of living labour). Or, in other terms: how is possible to combine something that is a pure 'abstraction', logistic rationality, with a capacity to capture something truly 'material', the bodies of the workers?

The Marxian concept of 'real abstraction' is very useful in this regard. Marx writes that, under capitalistic conditions, "it is only there that the abstract category 'labour', 'labour as such', labour *sans phrase*, the point of departure of modern [political] economy, is first seen to be true in practice (*praktisch wahr*)"[13].

Although labour is a meta-historical trait of the human being, it is only in the capitalist mode of production that labour becomes 'abstract', namely malleable, quantifiable, divisible, and measurable in terms of time. The point is that this abstraction has nothing intellectualist in itself but it is a force operative in the world. For Alfred Sohn-Rethel, the real abstraction is 'not thought-induced; it does not originate in men's minds but in their actions'[14]. By emphasizing that 'abstraction' is a process conditioned by material and spatial relations, even as it tends to obscure them, Sohn-Rethel stresses the active and operative aspects of abstraction over its conceptual qualities[15]. Abstraction has very little to do with an individual mental state; on the contrary, it embodies a form of social relation based on the subjection of a specific class of individuals; abstraction acquires a concrete character (in the form of exploitation and violence), but this is possible only when individuals are dispossessed of the means of production[16]. Marx thus grasped the material and political consequences of the process of formal rationalization inherent in the capitalist mode of production, highlighting the fact that processes of abstraction cannot be understood solely in a conceptual-scientific sense.

The notion of real abstraction is particularly useful for understanding power relations within urban space. Henri Lefebvre considers the emergence of abstract space and abstract labour as two closely intertwined issues in the capitalist mode of production[17]. Treating urban

[13] Marx 2010, p. 41.

[14] Sohn-Rethel 1978, p. 20.

[15] Tosel 2022, pp. 311-334.

[16] Basso L. (2015) Marx and the Common: From "Capital" to the Late Writings, Leiden: Brill pp. 108-145.

[17] Stanek L. (2008) 'Space as concrete abstraction. Hegel, Marx, and modern

space as a real abstraction, subjected to processes of quantification and rational measurement, requires investigating the material consequences of this formal rationalization.

Manfredo Tafuri, a historian of architecture and a leading figure of Italian *Operaismo*, examines the problem of architecture's position in the context of capitalist relations of production. A decisive role is assigned to the 'form'[18]. The city is assimilated to a natural, ahistorical object, a dead body. A dead and natural object is functional in convincing people of the objective necessity of the processes established by the bourgeoisie: the pursuit of formalization within architectural discourse keeps hidden the structures of power that the sublimation of form validates and reinforces. Therefore, architect becomes an "ideologue of the 'social'"[19].

Critiquing the architectural discourse which presents itself as a scientific abstraction implies understanding it not merely as a 'scientific' discourse, but as a practice of power that acts directly upon the life of the workers. The fact that architecture must take care of the *bios* is particularly evident in *The Athens Charter*, conceived by Le Corbusier. There, it is explicitly stated that urban planning must organize the life of the workers[20]. When Le Corbusier speaks about the necessity of organizing in an urbanistic setting the free time, housing, work and circulation of the people, the problem emerges of integrating these moments into a spatial form adapted for the reproduction of capital on a social scale. For this purpose, the city disappears as a well-defined form and turns into a process, a machine that must capture and govern living labour. It becomes 'infrastructure' of power.

As Tafuri explains: "the city itself, objectively structured as a machine for extracting social surplus value, reproduces, in its own conditioning mechanisms, the reality of the industrial modes of production"[21]. The factory has always exceeded its own boundaries because, to operate, it must extend its influence into every sphere of social life: the home, the school, medical care, leisure time.

In urban space, it is possible to grasp the 'social' production of surplus value. In fact, we have a capitalist society only when

urbanism in Henri Lefebvre', in Goonewardena K. (et alii) (eds.*), Space, difference, everyday life*, New York: Routledge, pp. 62-79.

[18] Tafuri 1998, pp. 6-35.

[19] Marx 1857 p. 6.

[20] Le 1973.

[21] Tafuri 1998, p. 16.

> The growing process of capitalist socialisation arrives at a point in which the production of capital must pose the task of constructing a specific type of social organisation. When capitalist production has generalised to the whole society – all social production has become the production of capital – only then, on this basis, does a genuinely capitalist society arise as a determinate historical fact. The social character of production has extended to such a point that the entire society now functions as a moment of production[22].

This means that every aspect of life outside the factory must be thought in analogy with working life inside the factory. In this sense, the factory wage regime extends to the work performed outside the industrial sector.

If we focus on the urban proletariat, especially workers employed in logistics, we observe a multiplication of forms of labour which don't have the 'free character' of industrial work; on the contrary, it is a type of work extremely flexible and precarious, with no access to collective bargaining[23]. Moreover, if we consider urban proletariat that works by mobilising "common" resources of humankind, such as knowledge, language, and emotional tools, this kind of work represents a temporal excess; in other words, it does not follow the abstract units of time that regulate work inside the factory[24]. Here arises a paradox.

On the one hand, the work of the urban proletariat exceeds the factory wage regime. Yet, at the same time, the work of the urban proletariat continues to be conceived within the wage regime and measured according to abstract units of time. If we fail to acknowledge this latter aspect, we risk overlooking the existence of a specific mode of production: the capitalist mode of production, based on the existence of abstract labour. For Marx, abstract units of time signify a specific historical relation of power. Time is made abstract because it represents the period during which workers give up the use of their generic capacities of production and corresponds to the time in which they are compelled to submit to the laws of capitalist accumulation, hav-

[22] Tronti 2019, p. 44.

[23] Mezzadra S., Neilson B. (2013), *Border as method, or, the multiplication of labour*, Durham and London: Duke University Press.

[24] See Marazzi C. (2008), *Capital and Language*, Los Angeles: Semiotext(e) and Negri A. (2018), *From the factory to the metropolis*, Cambridge: Polity Press.

ing no control over the methods, rhythms, or organization of labour. Abstraction, as we have seen, is not something intellectualistic, rather produces a relation of power. The wage is a reward for obedience; it is not a mere monetary phenomenon[25].

On the one hand, both work inside and outside the factory are forms of abstract labour and continue to follow the law of value, since both are subjugated to the law of capitalistic accumulation. On the other hand, the work of the urban proletariat tends to exceed abstract units of time. This paradox is well described by Paolo Virno, who states:

> The overflow of labour from society establishes a contradictory process, a theatre of violent oppositions and disturbing paradoxes. Labor time is the unit of measurement *in use*, but no longer the *true* one unit of measurement. To ignore one or the other of the two sides – that is, to emphasize either the validity alone, or the lack of veracity alone – does not take us far: in the first case, one does not become aware of the crisis of the society of labour, in the second case one ends up guaranteeing conciliatory representations in the manner of Gorz or Rifkin. *The surpassing of the society of labour occurs in the forms prescribes by the social system based on wage labour*[26].

Urban space is the universal exposition of the profound contradiction and ambivalence of the current mode of production. This ambivalence reveals new forms of subjugation but also possibilities of emancipation.

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[25] Screpanti 2008, pp. 1-38.
[26] Virno 2004, p. 101.

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Real subsumption of nature and the specter of Climate Behemoth

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Abstract

The article connects two strands of Marxist thought on climate change: eco-Marxist analyses of capital's real subsumption of nature and political-theoretical debates about sovereignty in the context of planetary crisis. Building on Paul Burkett and Andreas Malm, it argues that the real subsumption of nature – epitomized by the shift from waterpower to steam – must be understood as a strategy of capital in its struggle against labor and nature's autonomy. This process both intensifies exploitation and generates ecological degradation, thereby requiring political mediation through state regulation. Yet, as climate change now exceeds the territorial nation-state's capacity for such mediation, new forms of politics are needed. Engaging Joel Wainwright and Geoff Mann's Climate Leviathan, the text examines scenarios of planetary sovereignty and post-capitalist alternatives, highlighting the aporias of imagining a global capitalist sovereign and the dangers of descending into a "Climate Behemoth" of ecological and social collapse. Finally, it argues that the crisis of territorial sovereignty reflects the structural impasses of mediating conflicts produced by real subsumption. Escaping the catastrophic trajectory of capitalist progress requires embracing political forms beyond the nation-state while resisting the resurgence of the Behemoth.

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Keywords: real subsumption of nature, autonomy of nature, political regulation, planetary sovereignty, Behemoth

This short article attempts to bring together two strands of Marxist thinking on the problem of climate change. On the one hand, I will discuss the eco-Marxist movement in the narrower sense, which has "transferred" Marx's concept of the real subsumption of the labor process under the process of exploitation to the subsumption of nature under capital.[1] On the other hand, I will address the question of the transformations in the concept of the political brought about by the effects of climate change. In doing so, I will draw mainly on the theses developed by Joel Wainwright and Geoff Mann in their book Climate Leviathan: A Political Theory of our Planetary Future.[2]

These two dimensions of the Marxist approach to the problem of climate change can and must be thought of together. In fact, the process of real subsumption should be understood primarily as a form of optimization of exploitation, i.e. as a form of class struggle on the part of the capitalists against the resistant autonomy of labor and nature. This implies that real subsumption – both of the production process in the narrower sense and of the forces of nature in the broader sense – always raises the problem of the political mediation of antagonism. Marx himself – as will be shown below – sees an analogy between the overexploitation of human labor and the extractive exploitation of natural resources (such as soil fertility). He also sees an analogy between state regulation of working conditions and the fertilization of depleted soils to restore their fertility. But since fertilization methods – Marx mentions the guano – only postpone and displace the problem, Marx's analogy suggests that the exploitation of natural resources also requires state regulation, as is the case with the exploitation of labor.

However, the main problem I want to address in this article is not so much the fact that the process of real subsumption requires political mediation of the antagonism between capital and the autonomy of labor and nature. Rather, the problem addressed in this article is the aporias we become entangled in when we try to conceive of forms of political negotiation of conflicts that are not informed by the paradigm of the sovereignty of the territorial nation-state. One consequence of these aporias is that the framework of nation-state sovereignty makes it difficult, if not impossible, to devise radical alternatives to existing modalities of political negotiation. The danger

[1] Burkett 1999; Malm 2016; Mau 2023.
[2] Mann & Wainwright 2018; cf. Stephenson 2019; Blumenfeld 2023.

that the "climatic state of emergency"[3] will generate new forms of authoritarian, anti-egalitarian, and racist-nationalist modes of crisis management functional to the preservation of capitalist mechanisms of exploitation should not be underestimated. A corresponding differentiation of Wainwright and Mann's scenario of "Climate Behemoth", as attempted by others,[4] seems to be a prerequisite for the formulation of a constructive alternative to existing forms of politics.

But let us begin with the first point, namely with the "transfer" of Marx's concept of the real subsumption of the labor process under the valorization process to the relationship between capital and nature. In the Economic Manuscript of 1861-63, Marx distinguishes between formal and real subsumption of the labor process under capital.[5] The labor process is merely formally subsumed under capital above all in the early phases of capitalist development, or when capital takes possession of new production branches that were previously operated non-capitalistically. In these first phases of capitalist production, capital initially leaves the methods and technologies of production untouched. It adopts the old production methods and tools and subsumes the labor process only in the sense that the producers are now separated from the conditions of their production and therefore must sell their labor power to capital, which exploits them accordingly. Subsumption only becomes real when capital also changes the methods and technologies of the labor process to make them more efficient. Cooperation and division of labor as rationalizations in the organization of production as well as technological innovation through the introduction of new machines are all forms of real subsumption that make it possible for capital to increase the rate of exploitation of labor power (to produce relative surplus value).

The first author to point out that the real subsumption of the labor process under capital also involves a subsumption of nature was Paul Burkett.[6] This is particularly the case when the real subsumption not only concerns the organization of the production process (cooperation and division of labor) but also involves the introduction of new machines. The core of Burkett's argument can already be found in

[3] Mann & Wainwright 2018, p. 4.
[4] Blumenfeld 2023.
[5] Marx & Engels 1975-2004, vol. 34, pp. 93-117.
[6] Burkett 1999, pp. 64-67.

Marx, in the chapter on machinery in Capital Vol. I. We remember that Marx sees the machine as consisting of "three essentially different parts", namely the motor mechanism, the transmission mechanism and finally the tool or working machine.[7] And if the industrial revolution at the end of the 18th century initially started with the tool machine – by decoupling the tool from manual labor and thus mechanizing it – it was not long before the motor machine also had to be revolutionized. Marx makes a clear distinction between two forms of motor machine: the first form "receives its impulse from some already existing natural force, like the water-wheel from a head of water, the wind-mill from wind, &c." (ibid.); the second form "generates its own motive power, like the steam-engine, the caloric engine, the electromagnetic machine, &c." (ibid.). The revolutionization of the motor machine that followed the introduction of new tool machines consisted precisely in the transition from the first to the second form of motor machine. Capital subsumed the forces of nature in a real and not merely formal way, in that it took the operation of the laws of nature into its service to generate its own motive power.

This is one of the core theses of Andreas Malm's book Fossil Capital: the transition from water mills to the steam engine involves a real subsumption of nature under capital.[8] With Watt's steam engine, an engine is invented – to quote Marx again – "whose power was entirely under man's control [and] that permitted production to be concentrated in towns instead of, like the water-wheels, being scattered up and down the country".[9] However, Malm's thesis is not limited to merely stating the real subsumption of nature under capital, but also answers the question of the reasons for this subsumption. Malm sees the reasons for the real subsumption of nature under capital in the struggle between capital and labor power. For where does the structural compulsion for capital to permanently revolutionize production methods and introduce new technologies come from?

Two answers to this question are basically possible: one refers to the competition between capitalists, while the other sees the antagonism between capital and labor as decisive. We cannot go into the arguments for and against each of these two answers in detail in this

[7] Marx & Engels 1975-2004, vol. 35, p. 376.
[8] Malm 2016, pp. 309-314.
[9] Marx & Engels 1975-2004, vol. 35, p. 380.

short intervention. What is certain is that the two positions are not incompatible: individual capitalists can introduce new technologies and methods of production either because they thereby reduce production costs and gain an advantageous position over other individual capitalists (increase in relative surplus value), or because they thereby reduce their dependence on living labor. This second option is dealt with by Marx in his discussion of the "strife between workman and machine".[10] There he writes, among other things, that the machine is a "power inimical" to the workman:[11] machinery "is the most powerful weapon for repressing strikes, those periodical revolts of the working-class against the autocracy of capital".[12] And he adds: "It would be possible to write quite a history of the inventions, made since 1830, for the sole purpose of supplying capital with weapons against the revolts of the working-class".[13]

It is precisely this remark, which Marx did not pursue further, that Malm takes up in his book when he describes the replacement of the watermill by the steam engine in the textile industry as a consequence of the first structural crisis of industrial capitalism from 1825 and, above all, of the organization of the working class (the movement of the Chartists) that began with it.[14] What is particularly relevant for our current context is the fact that the introduction of the steam engine as a new motor mechanism, which generates its own motive power and therefore represents a real subsumption of nature under capital, takes place in a context that is structurally characterized by the antagonism between labor and capital. For this implies that the real subsumption of nature under capital is not merely a "technological" phenomenon but is from the outset closely interwoven with the problem of the political mediation of social antagonisms. This point has already been emphasized by Paul Burkett. In chapter 10 of Marx and Nature,[15] he discusses in detail the analogy, already underlined by Marx, between the exhaustion of labor power through maximum extension of the working day and the exhaustion of environmental resources through capitalist exploitation of nature. And it is significant

[10] Marx & Engels 1975-2004, vol. 35, pp. 430-440.
[11] Marx & Engels 1975-2004, vol. 35, p. 438.
[12] Marx & Engels 1975-2004, vol. 35, p. 438.
[13] Marx & Engels 1975-2004, vol. 35, p. 439.
[14] Malm 2016, pp. 58-76.
[15] Burkett 1999, pp. 133-143.

that Marx sees the doubly harmful effects of capitalist exploitation – on human labor and on the non-human environment – in connection with the structural necessity of regulatory and normative intervention by the state. Let us quote the key passage from the chapter of Capital Vol. 1 on the working day, where Marx discusses the legal acts to regulate the working day by the state:

> These acts curb the passion of capital for a limitless draining of labour-power, by forcibly limiting the working-day by state regulations, made by a state that is ruled by capitalist and landlord. Apart from the working-class movement that daily grew more threatening, the limiting of factory labour was dictated by the same necessity which spread guano over the English fields. The same blind eagerness for plunder that in the one case exhausted the soil, had, in the other, torn up by the roots the living force of the nation.[16]

Marx treats the exploitation of natural resources and that of human labor as phenomena that are, to a certain extent, symmetrical. At first glance, this symmetry does not seem to be complete in terms of the consequences of these phenomena. Marx initially sees the need for regulatory and normative state intervention as following from the overexploitation – the "limitless draining" – only of labor. Capital responds to the degradation of natural resources – in this specific case of soil depletion through excessive agricultural exploitation – with "technological" solutions – in this specific case, with the fertilization of the soil with guano. The example of guano also shows the limits of many purely technological solutions: they do nothing more than shift – spatially and temporally – the problem. In the case of guano, several negative consequences can be listed: environmental destruction in the Peruvian areas where guano is mined and collected; the overexploitation of Chinese coolies who worked in slave-like conditions in the guano fields; the establishment of new trade routes (Panama Canal) and geopolitical conditions that favored the rise of the US as a global "eco-imperialist" power.[17]

The fact that technological solutions alone are not ecologically, socially, and (geo)politically sustainable in the long term means that, sooner or later, regulatory and normative intervention by the state

[16] Marx & Engels 1975-2004, vol. 35, p. 247.
[17] Betancourt 2024.

will also be necessary with regard to the exploitation of natural resources. Friedrich Engels describes the logic brought to light by Marx with the concept of the state as the "ideal total capitalist" (*ideeller Gesamtkapitalist*):[18] if necessary, the state must intervene to regulate the "blind eagerness for plunder" of individual capitalists to guarantee the threatened general conditions of capitalist accumulation. This applies both to the exploitation of human labor and to the exploitation of natural resources. For the state must also fulfill its regulatory function with regard to the "real subsumption of nature," which Malm conceives as the capitalist response to the crisis and to the social antagonism between labor and capital.

However, the "symmetry" between state interventions to regulate working conditions and those to regulate the exploitation of natural resources is undergoing a historical transformation that relativizes the role of the territorial nation-state. This transformation is more evident in relation to environmental regulation. This is because environmental problems cannot be confined within the territorial boundaries of the nation-state. Climate change has a global dimension that transcends the boundaries of national sovereignty. And the regulation of the conditions of exploitation of labor as a commodity is also structurally confronted with the challenges posed by the global mobility of living labor and the "autonomy of migration."[19]

In their book Climate Leviathan, Joel Wainwright and Geoff Mann address the question of what transformations climate change could bring about in our concept of the political (*Begriff des Politischen*). They develop four ideal-typical scenarios along two axes – the first axis structured by the alternative between planetary and anti-planetary sovereignty, the second axis structured by the alternative between capitalism and non-capitalism (see Fig. 1). The "protagonist" of the book is the scenario called "Climate Leviathan", which the authors define, following Schmitt, as a form of sovereignty that would be able to get the climatic state of emergency under control. The Climate Leviathan corresponds to the capitalist version of a "planetary sovereign".

The authors know, of course, that a planetary Climate Leviathan contradicts the concept of the political as defined by Schmitt.[20] A

[18] Marx & Engels 1975-2004, vol. 24, p. 319.
[19] Mezzadra & Neilson 2024; cf. Ricciardi 2025.
[20] Schmitt 2007.

planetary sovereign would have no external enemies and would therefore be structurally incapable of monopolizing the friend-enemy distinction, as political sovereignty requires according to Schmitt.[21] The image of the "Climate Leviathan" also evokes associations with the concept of "ultra-imperialism", and it is anything but uncontroversial that the long-term dynamics of capitalist accumulation inevitably lead to such a state. Nevertheless, Mann and Wainwright present three arguments that are intended to make the emergence of a "world sovereign" seem plausible.[22] First, the "logic of weaponry" implies that the destructive potential of the weapons available to states is reaching planetary proportions, making it necessary for their use to be regulated by a supranational sovereign. Second, economic crises are also becoming increasingly intertwined internationally, which in turn necessitates regulatory authorities at the level of supranational sovereignty. And third, the global nature of the climate crisis also calls for a supranational Leviathan to intervene in a regulatory manner to ensure the conditions for capitalist accumulation.

The weakness of Mann and Wainwright's arguments seems to lie in the fact that they conceive the "adaptation of the political" to climate change as the "ideology of Climate Leviathan," just as progress was the "ideology of liberalism."[23] But just as liberal progress proved to be a "permanent catastrophe" and led to fascism,[24] "adaptation" to climate change – the "progress" of our time[25] – is more likely to manifest itself in the chaotic forms of the "Climate Behemoth." It would be wrong to conceive of the politics of the "Climate Behemoth" as based on simple denialism of the climate crisis. As Jacob Blumenfeld shows, there are forms of adaptation to climate change that amount to aggressive geopolitics for the appropriation of raw materials and militarized border regimes to control migration flows triggered, among other things, by climate disasters.[26] Donald Trump may have left the Paris Agreement, but his appetites for Greenland show that there is a "climate barbarism" that fully recognizes the consequences of climate

[21] Mann & Wainwright 2018, pp. 176-177.
[22] Mann & Wainwright 2018, p. 151.
[23] Mann & Wainwright 2018, p. 98.
[24] Benjamin 1999, p. 473: "The concept of progress must be grounded in the idea of catastrophe."
[25] Mann & Wainwright 2018, p. 98.
[26] Blumenfeld 2023.

change (such as ice melt) and seeks to exploit them for the purposes of capitalist accumulation (opening up, for example, new sea routes and new raw material deposits).

The latest geopolitical conjuncture of "diffuse war" and growing ethno-nationalism seems to confirm the Behemoth scenario. The return of war and territorialism should not be misinterpreted as a "return of the nation state." Rather, it is an attempt to regain control over the ungovernable dynamics unleashed by the transnational mobility of capital and labor in the context of the crisis of accumulation and climate change.[27] Mann and Wainwright also seem to suspect that their climate Leviathan will rather take on the characteristics of a global Behemoth. They write that the emergence of the world sovereign could follow "one of two geopolitical paths – producing, in effect, one of two types of empire, geopolitically distinct 'Climate Leviathans'": either the US will remain hegemonic in the world system and become the new "Climate Leviathan," or two (or more) major powers will compete for world hegemony and form a "multipolar" Climate Leviathan.[28] The authors describe this second scenario, which they consider "more likely," as follows: "Planetary governance would unroll on a lumpy, conflictual geopolitical terrain upon which elites continue to seek 'adaptations' that meet their needs – political stability, continued accumulation, and so on."[29] The dimension of chaos and disorder implied by this description seems to fit much better with the scenario of a global Behemoth than with the concept of a pacifying Leviathan.

The difficulty of conceiving a capitalist Climate Leviathan is only one of the aporias that we become entangled in when we try to free our political thinking from the straitjacket of territorial nation-state sovereignty. The problems posed by the post-capitalist scenarios are even more serious. I cannot go into detail here about the "Climate Mao" scenario, even though a post-capitalist reorientation of the most rational among the actors in a multipolar world may represent a way to escape the current climatic, social and geopolitical Behemoth. But let's look briefly at the fourth, unspecified scenario, "Climate X". Wainwright and Mann relate this figure of post-capitalist anti-sovereignty to Walter Benjamin's idea of the "real state of emergency" (*wirklicher Ausnahme-*

[27] Mezzadra & Neilson 2024; Ricciardi 2025.
[28] Mann & Wainwright 2018, p. 152.
[29] Mann & Wainwright 2018, p. 152.

zustand) from the VIII Thesis on the concept of history.[30] When Benjamin developed his idea of a "real state of emergency" to escape the catastrophe of capitalist progress, the chances for a revolutionary solution to the problem were not much better than they are today. And in view of the current return of the specter of the Behemoth, his advice is particularly valuable. Our task is to turn the catastrophe of adaptation into a project of constituent alternative that would be articulated beyond the framework of territorial state sovereignty. And we should not forget this: the reason why territorial state sovereignty seemed to be the only horizon within which politics could be conceived in the last few centuries was the need for political mediation of the conflicts generated by the real subsumption of people and nature under capital. If the global scale of these conflicts currently exceeds the scope of territorial state sovereignty, this may not only be bad news. The real problem we must confront is the return of the Behemoth.

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[30] Benjamin 1968, p. 257.

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	Planetary sovereignty	Anti-planetary sovereignty
Capitalist	Climate Leviathan	Climate Behemoth
Non-capitalist	Climate Mao	Climate X

Fig. 1. Mann & Wainwright, Climate Leviathan, 2018, p. 29.

Techno-Pathologies.
Rethinking Critical Theory as Philosophy of Technology

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Abstract

In this article I introduce the concept of 'techno-pathologies' as a key concept of a critical theory of technology. Building on Marx' view on technology, society and nature, and further developing the critical perspective on technological developments in advanced capitalism in older Critical Theory, I understand 'techno-pathologies' as crucial developments in techno-capitalism in times of climate change and species extinction. Far from determining all technological developments today, techno-capitalism is increasingly producing socially superfluous technological projects in areas where the mobilization of emancipatory powers is most urgently needed. The conceptual framework of 'techno-pathologies' is presented as enabling the differentiation between sensible technological developments from socially and ecologically destructive ones.

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Keywords: Techno-Pathologies, Philosophy of Technology, Critical Theory, Concepts of Nature, Concepts of Technology

1. *Introduction*

This paper will frame 'techno-pathologies' as a central concept of a critical theory of technology, appropriate in times of climate change and species extinction. This concept aligns with Marx's perspective on society and older Critical Theory and emphasizes the importance of technologies and social relations with nature. The idea is to analyze technological developments in terms of their socially progressive and emancipatory potential. In this context, first, I will present a problematic view of technology that recurs in current debates on ecological Marxism: that technology in capitalism is essentially destructive towards nature. Afterwards, I will develop my concept of 'techno-pathologies' and conclude by explaining how this concept can be related to current developments in techno-capitalism.

2. *Perspectives on Technology in Eco-Marxist Debates*

On the question of technology as a productive force, the conceptual framework in current eco-Marxist discussions is shaped by the notion of a fundamental connection between capitalism, technologies, and the planetary ecological crisis of our times. Nancy Fraser provides a widely shared eco-Marxist analysis of this connection, arguing that capitalism drives global warming non-accidentally, but "by virtue of its structure" [1]. In her understanding, capitalist societies are "entrenching a deep-seated tendency to ecological crisis at their very core"[2], based on intrinsic contradictions of capitalism regarding 'nature'. Even though, on the one hand, based upon an understanding of 'nature' as "the source of the means of production and the place for waste disposal"[3], capital accumulation and generating profit are linked with 'nature'. Yet, on the other hand, the costs of reproducing and regenerating this 'source' are ignored because, in the logic of capital, 'nature' is seen as the ontological 'other' of society:

> 'nature' as a realm of stuff, devoid of value, but infinitely self-replenishing and generally available to be processed in commodity production. […] The effect is to incentivize owners bent on maximi-

[1] Fraser N. (2021), 'Climates of Capital. For a Trans-Environmental Eco-Socialism", in: *New Left Review*, 127, p. 98.
[2] Fraser 2021 p. 99.
[3] Fraser 2021 p. 100.

> zing profits to commandeer nature's gifts as cheaply as possible, while also absolving them of any obligation to replenish what they take and repair what they damage.[4]

Fraser underlines that "*capital is also a relation to nature* – a predatory, extractive relation, which consumes evermore biophysical wealth in order to pile up evermore 'value', while disavowing ecological 'externalities'".[5] From a critical philosophy of technology perspective, these insights raise the following question: what, according to eco-Marxists, remains for critical analyses of current technological developments and, more generally, of the role of technologies as productive forces in contemporary capitalism. By taking the structural connection between capital accumulation and 'nature destruction' – understood as the destruction of the ecological foundations of society – as a fundamental critique of technology into account, not much seem to be left.

This becomes relevant when, for example, considering the role of geoengineering technologies addressing planetary ecological crises. Elmar Altvater, a leading figure in the debate on ecological Marxism in Germany, criticizes proposals to conduct scientific research on various geoengineering methods to combat global warming. He is of the view that "technologies of capitalism" can never dismantle capitalist logic.

One idea is to dim the sun by spraying light-absorbing substances into the upper atmosphere. Greenhouse gases in the upper atmosphere could also be captured and compressed into caverns left behind when mining coal seams or extracting oil and gas. Thus, *the technologies of capitalism* that caused the greenhouse effect and other ecological problems would be used to repair the damage done to planet Earth. As Albert Einstein said, such a plan is madness. However, this madness is inherent in the way ecological problems are conceptualized and political solutions are designed.[6] [emphasis added, W.D.]

[4] Fraser 2021.

[5] Fraser 2021 p. 101.

[6] Altvater E. (2016), *Rationale Naturzerstörung. Der Mensch lebt im „Anthropozän" – oder eher im „Kapitalozän"? Zum Streit um einen Namen für das Zeitalter eines kaputten Planeten.* Retrived November 22, 2025 from https://kritische-tiermedizin.de/2016/Rationale_Naturzerstoerung.pdf [Translated from German with DeepL, W.D.]

The crucial point for Altvater's assessment seems not to be based on whether CCS[7] technologies can be considered sensible in the view of the current state of scientific knowledge on climate change. The logic, rather, appears to be that the owners of former fossil fuel infrastructure now benefit twice over with CCS. As is evident, Altvater's idea of 'technologies of capitalism' fails to differentiate technologies that have fueled (and continue to fuel) global warming and new technologies being discussed and researched under the term 'geoengineering'. He, however, only appears focused on the idea that the latter do not challenge capitalism as the socio-historical cause of climate change.

Without questioning the perversity of oil companies' double profit in the case highlighted by Altvater, from the standpoint of a critical theory of technology the question arises as to whether the concept of 'technologies of capitalism' is useful for properly understanding the problematic nature of certain technological projects today, also from an eco-Marxist perspective. My concept of 'techno-pathologies' provides an alternative viewpoint. The reason I do so will become clear over the course of this paper. To this end, I believe it is important to address the potential misunderstanding promoted by Altvater's critique of technology, and the thesis advocated by Fraser. Both posit a kind of *fatal structural connection* between capitalism and the planetary ecological crises, without leaving a room for alternatives. I am contesting this position with the concept of 'techno-pathologies', and the aim is to highlight distinctions that can further develop an eco-Marxist critique of capitalism from the standpoint of a critical theory of technology.

3. *Technologies as Productive Forces*

Marx and the older Critical Theory understood technology in the conceptual framework of the *productive powers of labour*. For Marx, the technologies of his time were mainly means of the production of *Lebensmittel*. Within this framework, as 'objectified' or 'dead labour', technology materializes society's accumulated knowledge, skill, and cooperative capacities and augments the effectiveness of living labour – and thereby expands its social productivity. In this sense, technologies of production are essential in determining society's metabolism with nature.

[7] = Carbon capture and storage.

Marx's view of the technological developments of his time was marked by the apparent contradiction that, on the one hand, the industrial development of production created social wealth on a scale that represented a real break with historical conditions. On the other hand, the appropriation of this wealth was highly unjust and that the machines in the factories helped the capital owners to enslave the workers in a new form, rather than allowing them to share in the fruits of increased productivity.

In older Critical Theory, Marx's perspective on technology was further developed in response to the changed societal and technological conditions in 20th-century state monopoly capitalism. The fact that the understanding of emancipatory potentials of technologies as productive forces remained dominant in older Critical Theory until Herbert Marcuse's death in 1979 is demonstrated by the following note from his last lecture, entitled *The Children of Prometheus*:

> Control over nature is simultaneously control over human beings, by means of technical-scientific mechanisms of control, conditioning, manipulation; the apparatus of unfreedom. *But:* control over nature is also the production and utilization of the means for the liberation from the struggle for existence – the apparatus of freedom.[8]

At the same time, however, this note also testifies to the registration of a peculiar historical ambivalence of technologies in developed capitalism, which Marx was not yet able to analyze in this form. Namely, that technical and scientific productive forces were increasingly 'unleashed' in a direction that ceased to carry any emancipatory potentials.

This tendency of developed capitalism was highlighted in the chapter on the *Culture Industry* in Horkheimer and Adorno's *Dialectic of Enlightenment*[9]. In his seminal essay *The Work of Art in the Age of Mechanical Reproduction*[10], Walter Benjamin addressed the emancipa-

[8] Marcuse H. (2011) [1979], 'Children of Prometheus: 25 Thesis on Technology and Society', in: D. Kellner, C. Pierce (eds.), *Philosophy, Psychoanalysis and Emancipation. Collected Papers of Herbert Marcuse, Vol. 5*, London, New York: Routledge, p. 222.

[9] Horkheimer M., Adorno, T.W. (2002) [1944], *Dialectic of Enlightenment: Philosophical Fragments*, Stanford: Stanford University Press.

[10] Benjamin W. (1969) [1936], 'The Work of Art in the Age of Mechanical Reproduction', in: H. Arendt (ed.), Illuminations, New York: Schocken Books, pp. 217-251.

tory and democratizing potential of the new information and communication technologies of radio and film. However, Horkheimer and Adorno were critical of Benjamin's account of these potentialities. They argued that, if these potentialities existed at all, they had been hijacked and perverted by the capitalist logic of state monopoly in advanced capitalism. They were the first to note a socially pathological development of capitalist production logic whereby mass media are used to create needs through advertising, giving new goods apparent utility value. They criticize the rationalization of the culture industries, according to which they "emerged from the needs of consumers", as ideology. This obscures "the fact that the basis on which technology gains power over society is the power of capital over society". However, this is not due to "any law of motion of technology as such", but rather to its function in advanced capitalism.[11]

Horkheimer and Adorno thus highlighted an important distinction that must be made regarding technological developments in developed capitalism, namely that once the social productive forces of labour have reached a level at which basic needs can be satisfied and scarcity has been abolished, certain technological developments take on a different character. According to them, in such a situation, the irrationality of the increasingly technological social mechanisms of oppression becomes apparent.

This development also reveals the ideological nature of the supposed transformation of war technologies from socially destructive forces into productive forces that benefit civilization. This is particularly evident in the historical and technological turning point of the atomic bomb and the subsequent civilian use of the technologies of nuclear fission. In the case of nuclear energy, for example, civilian use of a technology often only emerges after its military development, and that it largely retains its destructive character. The enormous social resources and efforts poured into developing nuclear weapons were driven by its enormous destructive power, and it is this destructive power that must first be controlled for subsequent civilian use. The notion, propagated by its proponents, that nuclear energy is merely a useful technology with side effects is ideological, as it obscures the political and authoritarian nature of nuclear energy and its completely uncontrollable risks. This argument is further developed by Langdon

[11] Horkheimer 2002, p. 95.

Winner, whose discussion of the inherently political nature of certain technologies can also be understood as a critical further development of Marx's philosophy of technology. In *Do Artifacts Have Politics?*[12], Winner uses the example of nuclear power to show that its safe operation requires a strictly hierarchical techno social milieu of a "techno-scientific-industrial-military elite"[13] and is thus fundamentally structured differently from principally democratically organizable technologies, such as many forms of renewable energies like solar power.

4. *Techno-Pathologies*

Today's altered historical conditions call for new critical distinctions in the concept of technology. In my opinion, Altvater's understanding of technology, which was formulated in response to planetary ecological crises, is not helpful in this regard. Nevertheless, there is an element of truth in today's skepticism towards technology, given that some technological developments are deeply problematic, questionable or misguided, including their discursive and, in some cases, ideological underpinnings. It is conceptually appropriate to speak of pathological developments here, or 'techno-pathologies', as I call them. However, what is pathological is not 'too much' or 'too little' technological development or productivity. Rather, it is the direction, and the way certain current technologies are developed that is pathological. Today, we are dealing with a proliferation of techno-pathologies that inhibit, block or prevent more reasonable technological developments. Examples include the automation of warfare technologies coupled with civilian applications, capital-intensive projects that are scientifically questionable or even nonsensical – such as the extensive controllability and reversibility of evolutionary processes, 'de-extinction', 'cognitive enhancement' for environmentally conscious behavior, 'genetic pain disenhancement' in farm animals and the promise of giving birth to more intelligent babies through genetic screening and gene editing, artificial general intelligence, merging the human brain with AI systems and mind uploading as the ultimate goal of computer science and neurotechnology.

[12] Winner 1980, pp. 121-136.
[13] Winner 1980 p. 130.

The assumption that technological developments inherently possess emancipatory and progressive potentials is therefore false, as I aim to demonstrate with my concept of 'techno-pathologies'. In view of climate change and species extinction, it is clearly crucial to distinguish between different technologies. Climate change calls nowadays into question the progressive quality of technologies due to their reliance on fossil fuels, even though before they have enabled the supply of over 8 billion people on the planet. The societal appropriation of nature must also be limited to prevent species extinction, which highlights what I call the pathological character of certain technological developments. These developments not only fail to meet the historically developed needs of most people but also exceed the historical measure of reasonable appropriation of nature, pursuing scientifically and socially questionable goals.

I therefore believe that, considering today's circumstances, it is even more important not to abandon the genuinely Marxist view of the socially progressive potential of certain technologies, a perspective that was crucial to older Critical Theory and its critique of technology. However, we must not overlook significant changes in historical conditions. When considering the diverse dialectical relationships between technology, nature and society today, it is crucial to acknowledge historical differences such as the substantial growth in the global population, shifts in our comprehension of nature, and the emergence of historical new technologies. The task of conceptually differentiating between pathological and non-pathological technological developments must therefore consider the basic needs of a world population of over 8 billion people. It must discuss these differentiations in relation to societal essential and historically new technologies, i.e. today in relation to 'artificial intelligence' and robotics, but above all in relation to new genetic and biotechnologies, developments in reproductive medicine and cyborg technologies[14]. It must also proceed from an understanding of nature that is appropriate to these technological developments, but above all to the planetary ecological crises of climate change and species extinction, and that is based on the state of knowledge of the scientific disciplines involved in their research.

[14] In her techno-feminist essays from the 1980s and 1990s, Donna J. Haraway extensively explored critically the emancipatory potential of cyborg technologies. See Haraway D.J. (1985), 'A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century', *Socialist Review*, 80 (2), pp. 65-108.

This last point is particularly important for understanding techno-pathologies today. The planetary ecological crises represent the greatest challenge for the mobilization of emancipatory powers in history in overcoming these crises. This is particularly relevant to scientific knowledge production, which plays a central role in addressing the crises adequately. This also makes sciences relevant that have not traditionally been recognized as socially progressive in the tradition of Critical Theory, such as biology – especially evolutionary theory. Today, technological projects are being developed that are in tension with the state of knowledge in modern biology – a biology that, in light of climate change and species extinction, deals with the interrelationships of living nature from ecosystems to molecular biological processes in organisms. Such projects can be understood as techno-pathological developments that present themselves as reasonable and spectacular approaches to dealing with planetary ecological crises. In doing so, they tie up important social resources, including media attention, which are then lacking elsewhere.

The 'De-Extinction of the woolly mammoth' project by the US start-up *Collosal Bioscience* is a good example of this.[15] Colossal Bioscience, founded by Harvard-Genetics-Pioneer George Church, financed by private venture capital, is currently working on the creation of elephant-mammoth hybrids – genetically engineered creatures designed to endure Arctic conditions. Church explicitly aims with this project to remove technical and ethical barriers to so called 'de-extinction', the process of reviving extinct species through various biotechnological methods[16]. It involves techniques such as selective breeding, cloning, and genetic engineering to bring back species that have disappeared from the wild.

Researchers at Colossal Biosciences have already successfully implanted certain mammoth genes into mice, resulting in dense, woolly fur. This is represented as a significant step toward the de-extinction of the woolly mammoth, though major challenges remain. While genome editing techniques like CRISPR/Cas9 have proven effective in mice, experts question their feasibility in elephants due to long repro-

[15] *The Guardian* (2021), "Firm raises $15m to bring back woolly mammoth from extinction", https://www.theguardian.com/science/2021/sep/13/firm-bring-back-woolly-mammoth-from-extinction.

[16] Bovenkerk 2023, p. 384.

ductive cycles and genetic complexity. Scientists also debate whether fur alone is sufficient for mammoth revival. However, the study may benefit livestock breeding, as similar genetic modifications could enhance adaptation to extreme climates.

One of the ideas behind bringing back mammoths is that they might help slow the thawing of permafrost, thereby reducing the release of methane into the atmosphere. By clearing snow from the Siberian ground during winter, the soil can freeze more deeply, which in turn slows down the thawing process in the summer months. Key to this snow-clearing behavior are the mammoths' long, curved tusks – which allowed them to act like living snowplows by swinging their tusks back and forth. Based on this logic, researchers are now trying to genetically modify Indian elephants to develop similar tusks. Even if this highly complex process works, the problem remains that the desired behavior cannot be implanted by the appropriate genes. In the wild, such behaviors would normally be passed down through the social group – younger elephants would learn from older ones.

However, such promises rest on speculative narratives that stand in stark contrast to the realities of the current ecological crisis. We are amid the sixth mass extinction, where scientific consensus emphasizes protecting existing biodiversity and rewilding efforts grounded in re-establishing biodiverse ecosystems – not resurrecting iconic extinct species for ambitious experiments. This endeavor disregards the complexities of evolutionary processes, the fact that species extinction is about real loss, not a mere technical problem. Far from a visionary re-wilding strategy, this project reflects a troubling capitalist tendency to profit from creating unnecessary and perverse solutions to the planetary ecological crisis. By focusing on the spectacle of reviving extinct species, it distracts from the urgent need to preserve and restore ecosystems we still have, perpetuating a narrative that prioritizes novelty over ecological responsibility.

Far from determining all technological developments today, techno-capitalism is increasingly producing socially superfluous technological projects in areas where the mobilization of emancipatory powers is most urgently needed. The planetary ecological crises threaten not only the lives of over 8 billion people worldwide, but also the future of life on Earth as we know it. The conceptual framework of 'techno-pathologies' should enable us to differentiate sensible technological developments from socially and ecologically destructive ones.

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Marx After the Anthropocene: Pluriversal Thinking for More-than-Human worlds

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Abstract

This article provokes the ontological transition in recent Eco-Marxism debates in the discourse of the Anthropocene by integrating insights from new materialism, pluriversal orientation, and transcendental multiplicity. While debates between dualism vs monism strands of ecological Marxism, exemplified by Moore, Malm, Foster, and Saito, I argue that the ontological status of nature, agency, and the expanding of metabolic rift are still limited to the plurality of worlds through which ecological crises are lived and contested. From this view, capitalism functions not as an ultimate world-picture but as a regime that organizes and narrows the range of subjective capacities through which humans and nonhumans perceive, act, and relate. Countering capitalism therefore requires reactivating the intervals, frictions, and interruptions between worlds: those contested and monadic objects where emancipatory politics becomes thinkable. By foregrounding these pluri-worldings, this article reframes the metabolic rift as a pluriversal phenomenon: a structural disjuncture that manifests differently across situated ecologies, social formations, and even more-than-human worlds. Ultimately, the argument advances new pluriversal eco-Marxism that affirms both the material reality of ecological collapse and the multiplicity of worlds through which planetary conditions are interpreted, resisted, and transformed. Such an alternative approach, it offers a more grounded, relational, and politically expansive way of imagining life after the end of Anthropocene.

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1. *Eco-Marxism*[1]

In this article, I made a reflective thinking concerning another possible about the end of the world of Capitalism in which the relation between Marxism and Ecology. Firstly, the ecological crisis is accelerating at a pace that gives this phase a new and increasingly ironic yet alarming significance. One of its primary drivers, called fossil-fueled in neoliberal capitalism orientation, has rapidly pushed us toward the end of humanity, producing ever more barbaric socio-economic and environmental conditions as the system's own creation. As Burkett (2017)[2] argues, the system of fossil-fueled neoliberal capitalism is indeed approaching an "end of history," but only in the sense that it forecloses any further historical advancement of humanity as a productive, political, and cultural species. The increasingly barbaric conditions it generates leave no alternative to the end of history as we currently know it.

However, two other responses have emerged: an optimistic one that affirms humanity's capacity for concrete political action derived by Naomi Klein[3], and a pessimistic one that claims humanity as a civilizational actor is already dead inspired by Roy Scranton[4]. Mediating

[1] Many thanks for reviewers and editors in this proceeding as part of the Marx in the Anthropocene Conference, Iuava University of Venice, Italy 11-14 March 2025. Also, special thank for Albertus Arioseto Bagas Pangestu (a researcher in Centre for Anthropocene Studies and Geophilosophy) that deeply help me in expanding this article ideas.

[2] Paul Burkett, "An Eco-Revolutionary Tipping Point? Global Warming, the Two Climate Denials, and the Environmental Proletariat," *Monthly Review* 2017, https://monthlyreview.org/articles/an-eco-revolutionary-tipping-point/.

[3] Naomi Klein, *This Changes Everything: Capitalism vs. the Climate* (Simon & Schuster 2014).

[4] Roy Scranton, *Learning to Die in the Anthropocene: Reflections on the End of a Civilization* (City Lights Books 2015).

between these positions, further, Marx's analysis of the eco-political conditions of the ecological crisis becomes a crucial point of significance that must be foregrounded.

Ecological Marxism and ecosocialism began to take shape in the 1980s, marking an early attempt to bring ecological questions into the Marxist tradition. Among the foundational contributions were James O'Connor's seminal article in *Capitalism, Nature, Socialism* (1988), Martin O'Connor's edited volume *Is Capitalism Sustainable? Political Economy and the Politics of Ecology* (1994), and Ted Benton's *The Greening of Marxism* (1996). The central motivation behind these early explorations is articulated by Foster (1998)[5], who asks whether Marx's critique of political economy can play an essential role in reconstructing social theory in an age of planetary crisis, and to what extent Marx offers insights that are indispensable for understanding contemporary ecological malaise.

Within this intellectual landscape, three major interpretive camps emerged. The first contends that Marx's thinking was fundamentally anti-ecological. A view they argue is reflected directly in Soviet environmental degradation. The second group maintains that Marx provided meaningful, though scattered, observations on ecology, even if he ultimately adopted a Promethean or techno-optimistic position. The third insists that Marx possessed a deep and systematic awareness of ecological degradation, especially with respect to soil and the conditions of the earth, and that ecological concerns were integral to his conceptions of both capitalism and communism. In this reading, Marx's work already gestures toward a theory of sustainability as a necessary component of any future society. Foster characterizes these groups collectively as proponents of first-stage ecosocialism.

First-stage ecosocialists emerged at a moment when unifying "Red" and "Green" thinking was seen as urgently necessary to rehabilitate the left during the crises of the 1980s and 1990s. Their goal was to supplement what they perceived as an ecological absence within Marx's critique of political economy. Yet, in doing so, many abandoned key Marxian concepts (value theory, class analysis, and socialism), while seeking to subsume traditional labor movements under the rising momentum of environmentalism following the collapse of

[5] John Foster, "The Communist Manifesto and the Environment," in *Socialist Register 1998: Communist Manifesto Now*, ed. L. Panitch and C. Leys (1998), 169, https://www.academia.edu/download/119284533/2601.pdf.

"actually existing socialism." As Foster (2014) later noted, this trend was defined by attempts to graft Marxist categories onto established green theory, or vice versa, as seen in the work of André Gorz, Ted Benton, James O'Connor, Alain Lipietz, and Joel Kovel.[6]

A second stage of ecosocialism emerged in the late 1990s and early 2000s, led by Paul Burkett's *Marx and Nature: A Red and Green Perspective* (1999) and Foster's *Marx's Ecology* (2000). Foster's contribution is particularly notable for its careful reconstruction of Marx's engagement with the natural sciences, revealing the theoretical significance of the concept of "metabolism" (*Stoffwechsel*) as developed through Marx's study of Justus von Liebig's *Agricultural Chemistry*. Foster demonstrates that Marx viewed the "metabolic rift" under capitalism as a fatal distortion of the human-nature relationship, underscoring the necessity of socialist strategies to repair this rift and create ecologically sustainable forms of production.

Burkett's work was explicitly framed as a refutation of first-stage ecosocialism. Instead of treating ecosocialism as a corrective successor to Marxism, Burkett reconstructed Marx's critical ecological outlook, emphasizing that Marx's materialist conception of nature must be understood as a counterpart to his materialist conception of history. Second-stage ecosocialists thus sought to transcend both the limitations of first-stage ecosocialism and the spiritualistic, idealistic, and moralistic tendencies of green theory. As Foster summarizes, this project aimed at developing a more comprehensive ecological Marxism grounded in classical materialism (Foster 2014, 58). Central to this view is Raymond Williams' insight that the problem with modern society is not that it is too materialist, but that it is "not materialist enough" – in the use-value sense.

More recently, a third stage of ecosocialism has emerged, represented by works such as Naomi Klein's *This Changes Everything: Capitalism vs. the Climate* (2014) and Stefano B. Longo et al.'s *The Tragedy of the Commodity* (2015). According to Saitô[7], this third-stage ecosocialism, particularly influential in the United States, extends ecosocialist analysis beyond a narrow Marxist or far-left base, examining the structural limits of sustainability under capitalism across domains such as global warming, agriculture, and fisheries.

[6] John Bellamy Foster, "Paul Burkett's Marx and Nature Fifteen Years after," *Monthly Review* 66, no. 7 (2014): 57.

[7] Saito 2023, p. 10.

2. *Marx and Anthropocene*

Since the rise of second-stage ecosocialism, Marx's (and Engels's) conception of "metabolism" has become a central point of reference in ecological Marxist debates on the Anthropocene. Initially rooted in the natural sciences, the concept later proliferated across the social sciences and humanities, with Marx and Engels offering only fragmentary yet foundational insights. Yet, according to Fischer-Kowalski (1997) that "…the subject of labour may be 'spontaneously provided by nature' or it will have been 'filtered through past labour..."[8]. Thus, these fragments exist in ecosocialism movement because Marx never explicitly positioned himself within an ecological research agenda; rather, Marx's ecological ideas have been excavated by later ecological Marxists, particularly those of the second stage.

At first glance, Marx (2024) discusses ecological concerns only in relation to the dynamics between nature and capitalism. The idea of dialectical and historical materialism is shaped by Marx's notion of the Earth as a reservoir of resources – a universal instrument enabling production and mediating the material exchange between humans and nature. Under capitalism, however, this metabolic interaction becomes disrupted, as Marx said.

> Labor is a process involving human beings and nature; in it, their own activity mediates, regulates, and controls their metabolizing of nature. When human beings work with materials found in nature, they are acting as a natural force[9].

Inspiring from Marx's vision, this article only focuses on two of the five fields of inquiry that link ecological Marxism and the Anthropocene discourse: Marx's conception of the "universal metabolism of nature," as briefly outlined above, and the subsequent discussion of the "metabolic rift," which has implications extending beyond ecological Marxism[10]. And the three remaining debates are the concept of

[8] Marina Fischer-Kowalski, "Society's Metabolism: On the Childhood and Adolescence of a Rising Conceptual Star," in *The International Handbook of Environmental Sociology*, ed. Michael R. Redclift and Graham Woodgate (Edward Elgar Publishing 1997), 122, https://doi.org/10.4337/9781843768593.00015.

[9] Karl Marx, *Capital: Critique of Political Economy*, ed. Paul North, trans. Paul Reitter, with Wendy Brown and William Clare Roberts (Princeton University press, 2024), 153.

[10] Rangga Kala Mahaswa, "Keretakan Antroposen: Membaca Stagnasi Wacana Ekologi Marx," *Jurnal IndoProgress* 3, no. 1 (2024): 82-111.

nature's production[11]; natural limits or ecological boundaries under capitalism[12]; and the second contradiction of capitalism[13], even serve only as complementary discussions.

Moreover, the contemporary debate on metabolism and the metabolic rift is shaped, for instance, by the critical exchange between Jason W. Moore[14] and John Bellamy Foster. The central point of contestation begins with the internal dynamics of the Anthropocene concept, which, in its early formulation, was criticised for embodying a techno-optimistic and, in Marxian terms, "Promethean" orientation toward the ecological crisis. A telling example can be found in Paul J. Crutzen's proposal to deploy sulfate aerosols into the atmosphere to cool the planet, a suggestion grounded in technological confidence rather than socio-economic critique[15].

In Marxist critics, it argues that the Anthropocene narrative, as an extension of geological epoch-making, inadvertently reinforces the credo of human dominion over nature. It fails to interrogate whether existing modes of production and their technological infrastructures operate within a just or ecologically viable political-economic framework. By naturalizing these dynamics as expressions of "the human species," the Anthropocene is rendered incapable of critically addressing capitalism's historically specific social relations. This oversight becomes evident in the illusory promise of large-scale technological systems and the simultaneous intensification of fossil-fuel dependence[16].

[11] David Harvey, *Justice, Nature, and the Geography of Difference* (Blackwell Publishers 1996); Neil Smith, *Uneven Development: Nature, Capital and the Production of Space* (Blackwell 1984).

[12] Ted Benton, "Marxism and Natural Limits: An Ecological Critique and Reconstruction," *New Left Review*, November 30, 1989, 51-86, https://doi.org/10.64590/u9n; Karl Kautsky, *Die Agrarfrage: Eine Übersiche über die Tendenzen der modernen Landwirtschaft und die Agrarpolitik der Sozialdemokratie* (Dietz 1899).

[13] James O'Connor, "Capitalism, Nature, Socialism a Theoretical Introduction," *Capitalism Nature Socialism* 1, no. 1 (1988): 11-38, https://doi.org/10.1080/10455758809358356.

[14] Jason W. Moore, *Capitalism in the Web of Life: Ecology and the Accumulation of Capital*, 1st Edition (Verso 2015).

[15] Paul J. Crutzen, "Albedo Enhancement by Stratospheric Sulfur Injections: A Contribution to Resolve a Policy Dilemma?," Climatic Change 77, nos. 3-4 (2006): 211, https://doi.org/10.1007/s10584-006-9101-y.

[16] Andreas Malm and Alf Hornborg, "The Geology of Mankind? A Critique of the Anthropocene Narrative," *The Anthropocene Review* 1, no. 1 (2014): 62-69, https://doi.org/10.1177/2053019613516291.

For this position, offering an alternative horizon, as Andreas Malm proposes another idea of "capital fossil" or "Capitalocene," a geological epoch defined not by human age or everyday human activity, but by the age of capital itself[17]. Furthermore, Moore also inherits this idea and extends it, aligning with more the Capitalocene thesis or the Green Arithmetic: "Society plus Nature equals environmental studies."[18]. Yet, the debate expands between Moore that criticizes Foster's separation of "nature" and "society," as articulated in the metabolic rift, arguing that it reproduces implicitly Cartesian dualism and mirrors the conceptual flaw at the heart of the Anthropocene debates. In this view, I conclude that Moore instead advances a monist ontology of the world. For Moore, dualism falsely divides humans as a social community (in a broadly Marxian sense) from the rest of nature. In advance, this division must be rejected, as Moore argues. It is because the roots of today's ecological crisis lie precisely in such a separation. The reduction of the world to a unified, co-constituted web of human-extra-human relations is, for Moore, unavoidable.

On the other hand, Saitô maintains that the debate between Foster (dualism) and Moore (monism) is effectively settled, leaving Marx unburdened by Moore's critique and still open to further theoretical development, called "degrowth communism", to conceptualize the relationship between humans and nature and its contradictions in the Anthropocene.

However, from a broader perspective, the debate remains far from resolved as I suggested. It retains significant potential for deeper investigation, particularly regarding today's ecological crisis. Given that Anthropocene discourse continues to flourish across the social sciences and humanities accepted as "geological event" rather than "epoch", especially after its formal rejection by the IUGS in 2024. Thus, there is a need to explore methodological pathways that intersect with ecological Marxism yet move in new directions. Following my philosophical position in this article, as an initial orientation, aligns closely with Moore's stance to New Materialism.

[17] Malm and Hornborg, "The Geology of Mankind?".
[18] Moore, *Capitalism in the Web of Life*.

3. *The Anthropocene Challenges: The Outside of Marxism*

The debate of Anthropocene is not limited from Marxism perspective, but also from it's the outside of academia. The New Materialism as a new branch that also breaks the discussion of dualism, as a new philosophical position that often said to stand in tension with the dialectical-historical materialism of the Marxist tradition. At the surface level, and with respect to its genealogy (Derrida-Deleuze) and distinctive characteristics, Slavoj Žižek (2014) and Terry Eagleton (2016) write:

> New materialism is materialist in the sense in which Tolkien's Middle Earth is materialist: as an enchanted world full of magic forces, good and evil spirits, etc., but strangely without gods – there are no transcendent divine entities in Tolkien's universe, all magic is immanent to matter, as a spiritual power that dwells in our terrestrial world… "[...] as did Deleuze, New Materialism relies on the implicit equation: matter = life = stream of agential self-awareness – no wonder New Materialism is often characterized as 'weak panpsychism' or 'terrestrial animism'[19].

> [...] new materialism [...] is really a species of post-structuralism in wolf's clothing. Where thinkers like Jacques Derrida say 'text', new materialists say 'matter'[20].

According to Rick Dolphijn (2024), yet for New Materialists themselves, the tradition is understood as perpetually new. It is still lacking a fixed history and open to any genealogical elaboration, as Dolphijn stated:

> What makes this a new materialist genealogy is thus not that, ultimately, this genealogy is Braidottian, Delandaish, Baradian, Spinozist, Deleuzian, Kohnian, or Vogel and Dussutourian, for that matter. Rather, it is new materialist because, starting from the way in which all of these ideas (and more) relate, a new materialism unfolds. This new materialism is necessarily a new, new materialism[21].

[19] Slavoj Žižek, *Absolute Recoil: Towards a New Foundation of Dialectical Materialism* (Verso 2014), 13, 15.

[20] Terry Eagleton, *Materialism* (Yale University Press 2016), 11, https://doi.org/10.12987/9780300225112.

[21] Rick Dolphijn, "CHAPTER 1 Introduction: Mapping the New Materialist Terra Incognita," in *Methods and Genealogies of New Materialisms*, ed. Rosi Braidotti et al. (Edinburgh University Press 2024), 38, https://doi.org/10.1515/9781399530071-005.

For figures such as James K. Feibleman (1970) and Diana Coole and Samantha Frost (2010), the materiality of matter is not inert or static, as presupposed by Newtonian physics and the classical scientific worldview[22]. On the contrary, matter is assumed to possess productive, active, and fluctuating materiality. Also, Feibleman refers to this specifically as "re-materialization". Whereas Newtonian materialists emphasize quantifiable dimensions to justify the existence of an object, Feibleman stresses that materiality persists even when such dimensionality is altered. For instance, a rabbit remains existent not merely through its measurable weight or length; it remains a "thing" even when transformed into a corpse, decomposed soil, or a preserved specimen. This position highlights matter's productive, active, and fluctuating capacities.

Interestingly, this new tradition subsequently differentiates into three distinctive orientations: (1) Spinozist-Deleuzean vitalism, (2) Derridean performativity, and (3) negative materialism[23]. Two of these adopt the perspectives of immanence, flat ontology, and monism (vitalism, performativity), as well as the unity of subject and object. Starting from Spinozist-Deleuzean vitalism is represented widely by Gilles Deleuze, Jane Bennett, Friedrich Nietzsche, Georges Canguilhem, and Manuel DeLanda, all of whom affirm the Bergsonian notion of the organism's self-production[24]. Derridean performativity, in contrast, is articulated by figures such as Vicki Kirby (1997) and Karen Barad (2007).

Meanwhile, negative materialism attempts to avoid monist variations altogether. In Quentin Meillassoux's speculative materialism (2012), for instance, a perspective of poly-dualism is proposed:

> On the contrary, we need dualisms everywhere – pure differences in nature, without any continuity whatsoever [...] Not a mono-pluralism, but a poly-dualism[25].

[22] James Kern Feibleman, *New Materialism*, 1st ed (Springer Netherlands 1970); Diana Coole and Samantha Frost, eds., *New Materialisms: Ontology, Agency, and Politics* (Duke University Press 2010), https://doi.org/10.1215/9780822392996.

[23] Christopher N. Gamble et al., "What Is New Materialism?," *Angelaki* 24, no. 6 (2019): 111-134, https://doi.org/10.1080/0969725X.2019.1684704.

[24] Georges Canguilhem, *Knowledge of Life*, 1st ed, trans. Paola Marrati and Todd Meyers (Fordham University Press 2008).

[25] Quentin Meillassoux, "Iteration, Reiteration, Repetition: A Speculative Analysis of the Meaningless Sign". Lecture at Free University, Berlin, 20 April 2012," 2012, 15.

Despite their differences, all three orientations open further inquiry into objects as foundational reality (ontological primacy), even if they do not reduce the role of subjects or cognitive agents. This helps clarify why Meillassoux avoids terms such as "materialism" or "the Great Outdoors," even while his speculative rationalism ultimately grounds itself in the mathematization of nature[26].

From this point, the implications of this tradition's emergence are twofold. First, it introduces a turn toward "the more-than-human world" as part of a new mode of thinking. This move expands beyond philosophy into the sciences, exemplified in geography and anthropology's recent focus on "nature-culture."[27] The shortcomings of anthropocentric regimes are increasingly being exposed, accompanied by a growing push to view the human from the perspective of the nonhuman. New political theories have emerged in this context; for instance, debates on how to position nonhuman entities, such as animals, within today's global capitalist regime. In a different but related theoretical trajectory, Richard Grusin (2015) beautifully provides a comprehensive mapping of these developments.

> Actor-network theory, particularly Bruno Latour's careerlong project to articulate technical mediation, nonhuman agency, and the politics of things; Affect theory, both in its philosophical and psychological manifestations and as it has been mobilized by queer theory; Animal studies, as developed in the work of Donna Haraway and others, projects for animal rights, and a more general critique of speciesism; The assemblage theory of Gilles Deleuze, Manuel De Landa, Latour, and others; New brain sciences like neuroscience, cognitive science, and artificial intelligence; The new materialism in feminism, philosophy, and Marxism; New media theory, especially as it has paid close attention to technical networks, material interfaces, and computational analysis; Varieties of speculative realism including object-oriented philosophy, neovitalism, and panpsychism; Systems theory, in its social, technical, and ecological manifestations.[28]

[26] Quentin Meillassoux, *After Finitude: An Essay on the Necessity of Contingency* (Continuum 2008), 7.

[27] Rosi Braidotti, *The Posthuman* (Polity Press 2013), 3; Donna Haraway, *The Companion Species Manifesto: Dogs, People, and Significant Otherness*, 6th print, Paradigm 8 (Prickly Paradigm Press 2012), 11-12; Sarah Whatmore, *Hybrid Geographies: Natures Cultures Spaces* (SAGE Publications Ltd 2002), 162-163, https://doi.org/10.4135/9781446219713.

[28] Richard Grusin, ed., *The Nonhuman Turn*, Center for 21st Century Studies (University of Minnesota Press 2015), viii-ix.

Second, I propose to Moore's critique within ecological Marxism, it renews attention to the hegemony of post-Cartesian dualism and post-Kantian rationalism. This onto-epistemic stance is known as post-dualism, or, adopting in Bergson's paraphasing, the "pushing of dualism (mind–body) to an extreme," a form of mono-dualism that assumes material reality undergirds mental reality. In this idea, the more-than-human world, then, is positioned as essential for addressing the crises associated with the Anthropocene. Therefore, my argument follows that anthropocentrism has long overshadowed such ways of seeing, rendering empathy toward more-than-human worlds, and understanding the roots of crisis beyond dualistic modernity – urgently necessary.

Learning from Skiveren (2023), as these post-dualist paradigms rise to prominence within Anthropocene discourse, this is an unavoidable question arises:

> And yet, as these lines of thought move to the foreground, we are not only offered a new set of focus points but also confronted with a new set of intellectual challenges. [...] Does Deleuzian monism or Hegelian dialectics point the way forward? What qualifies as collective agency? Should we opt for an 'old' or 'new' materialism?[29]

4. *Pluriversal Worlds as A New Ecological Marxism Vision*

For the last passage, I end this discourse by offering an alternative solution called "pluriversal turn" reposition as inspiring by Arturo Escobar, Marisol de la Cadena, Mario Blaser, and others[30]. As Min

[29] Tobias Skiveren, "New Materialism and the Eco-Marxist Challenge," *Environmental Humanities* 15, no. 2 (2023): 181-194, https://doi.org/10.1215/22011919-10422355.

[30] António Carvalho and Mariana Riquito, "Listening-with the Subaltern: Anthropocene, Pluriverse and More-than-Human Agency," *Nordia Geographical Publications*, ahead of print, March 3, 2022, https://doi.org/10.30671/nordia.107404; Arturo Escobar, *Designs for the Pluriverse: Radical Interdependence, Autonomy, and the Making of Worlds*, New Ecologies for the Twenty-First Century (Duke University Press 2018); Mario Blaser, "Ontology and Indigeneity: On the Political Ontology of Heterogeneous Assemblages," *Cultural Geographies* 21, no. 1 (2014): 49-58, https://doi.org/10.1177/1474474012462534; Marisol De La Cadena, *Earth Beings: Ecologies of Practice across Andean Worlds*, ed. Robert J. Foster and Daniel R. Reichman (Duke University Press 2015), dup;9780822375265/1, https://doi.org/10.1215/9780822375265; María Del Carmen Villarreal Villamar, "The Anthro-

Seong Kim's (2024) highlight that "…the ramifications for radical politics of the indigenous, ontological, and speculative turns in anthropology and social theory have yet to be fully explored… [it] represents an opportunity and a call for post-Marxism to radically depart from its logocentric and anthropocentric assumptions and to adequately theorize the political in the multiple more-than-human worlds that pluriversal politics seeks to foster."

Here, I also attempt to hold a critical position opposed to the orientation of New Materialism (NM) in the recent debate in-between the Anthropocene (or Capitalocene) among Ecological Marxists. If Foster argues that NM is reductively monistic, failing to consider the importance of dualism (or in Marxian diction, "dialectics"), and labels it a bourgeois ideology. Meanwhile, Saito contends that NM's immersion in monistic discussions leads it to the same errors as Anthropocene experts like Crutzen, such as an exalted Prometheanism projection. However, this critique contains an element of self-critique, as some within Ecological Marxism hold positions that overlap with NM. Malm To NM, Malm begins to sound more like "a distant relative" than "an arch-enemy". Consider Malm's definition of nature, which seems to refer to the same phenomena NM conceptualizes as non-human agency:

> [...] the material structures and processes that are independent of human activity (in the sense that they are not a humanly created product), and whose forces and causal powers are the necessary conditions of every human practice, and determine the possible forms it can take.[31]

In this position, NM even agree on a post-dualist trajectory, asserting that society, though unified monistically, remains distinct in a dualist sense (mono-dualism). Or, in Malm's terminology, this is called "substance monist materialist property dualism". Unlike Saito, who remains passive regarding the outcome of this debate, the key to

pocene and the Possibilities for Creating a Pluriversal Politics: Pluriversal Politics: The Real and the Possible, by Arturo Escobar, Durham: Duke University Press 2020, $25.95 (Paperback), ISBN: 9781478007937," *Journal of Intervention and Statebuilding* 16, no. 3 (2022): 386-392, https://doi.org/10.1080/17502977.2021.1879876.

[31] Andreas Malm, *The Progress of This Storm: Nature and Society in a Warming World*, Paperback first published (Verso 2020).

mediating the monism-dualism conflict within Ecological Marxism is to shift the focus to the micro-level. However, this is a worthwhile experiment to open up the possibility of class struggle that does not contradict the ecological crisis, returning to a basis of human agency that is not reductively monistic and not confined to a dualistic level[32].

On the other hand, We also can expand this another middle path that advocates for the micro-level without abandoning the subject cannot adopt the subjective materialism outlined by Slavo Žižek (2006), or the approach of "planetary" history like Dipesh Chakrabarty (2021), who seek to explain Anthropocene subjectivity amid geodeterministic reality[33]. As far it cannot be revealing the realism of the social domain.

Ontologically speaking, Deleuze's Bergsonian subject (the concept of subjective time/the past), which emphasizes PLURALISM = MONISM, also can be reviving class struggle replaced by rhizomatic movements that are deterritorialized and reterritorialized in the formation of a more social community. Unfortunately, upon closer analysis, Deleuze still cannot adequately address the level of intersubjectivity or social construction. For Deleuze, each subject is enclosed in a context of radical difference through his concept of radical pluralism, categorized as a possible world with no space for any subjectivity to access it, existing only in the domain of the virtual[34]. It means that there is no bridge or the way for subjects to access one another, a requirement for social constructivism, let alone for collectively understanding the non-human world.

To address this issue, we can add "transcendental multiplicity," as it accommodates in terms of social realism. This thesis of Transcendental Multiplicity (TM) has three primary concepts, as Rok Benèin (2024) argued. First, TM moves beyond the subject-object confusion debated by Ecological Marxists (whether dualist or monist) and NM, positing a shared totality that is itself a site of disagreement as the very

[32] Carl Cassegård, *Toward a Critical Theory of Nature: Capital, Ecology, and Dialectics*, Critical Theory and the Critique of Society (Bloomsbury Academic 2021).

[33] Slavoj Žižek, *The Parallax View* (The MIT Press 2006), https://doi.org/10.7551/mitpress/5231.001.0001; Dipesh Chakrabarty, *The Climate of History in a Planetary Age* (The University of Chicago Press 2021).

[34] Gilles Deleuze, *Difference and Repetition*, trans. Paul Patton (Continuum 2001), 51; Gilles Deleuze, *The Fold: Leibniz and the Baroque*, trans. Tom Conley (The Athlone Press 1993), 81.

condition for the differences between social communities and even individual subjects. This is its ontological primacy, demonstrated in the theses of divergence and overlapping. Second, the multiplicity of transcendental subjects in TM that guarantees social realism is not assumed to be exclusive to humans. For instance, animals also possess their own transcendental capacity, justifying a non-human realm without falling into absolutism, immanence, or monism. Third, every transcendental subject or community constantly rationalizes, as well as addressing the concerns of Foster and Saito, two types of objects that guarantee social realism as its ontological status.

In Benèin terms, this is a universality concerning a shared world, and looking back reflectively the two domains of objects. Firstly, Contested Objects that belong to several worlds simultaneously without this fact disrupting their existence in any one of them. However, at certain points, their existence in one world becomes incompatible with their existence in another, triggering a conflict between worlds. Secondly, Monadic Objects. This other type of objectivity, trapped between worlds, relates to interference – the appearance of one world within another. It is a coordinate of possible experience, a window onto another world (e.g., extraterrestrials entities in Arrival (2016) sci-fiction movie). The crux is that monadic objects explain the "possible worlds" that generated by every transcendental subject that are not present in the actual world. It is possible to articulate a subject's hopeful activity regarding actual objects not present in transcendental perception. From this perspective, through the interplay of monadic and contested objects, we can also understand that no movement is immune to critique, which must be consistently applied (something rhizomatic thought lacks), even as they strive to seize the means of production in the form of contested objects.

Finally, Benèin (2024) added the problematization of the universalized world of Anthropocene and how its relying with the picture of global capitalism:

> The problem of climate change and the discourse on the Anthropocene comes into view here as another kind of totalisation that seems to demand the abandonment of the apparently all-too-human concept of world…. The problem, I argue, is not how to represent capital as the structuring principle of the social totality, the problem is how to capture the junctures at which the world of capitalism crosses or interrupts other worlds. Despite the difficulty of forming a

> clear picture of the global social reality, local encounters with contested objects, through which the capitalist transcendental cuts across worlds of labour, culture, nature and so on, are proliferating. In a realm of multiple worlds, cognitive mapping would thus constitute a mapping of local conflicts and interferences between worlds.[35]

In this sense, pluriversaling the Anthropocene – by asserting insights from Pluriverse, New Materialism, and Benèin's recent concept of Transcendental Multiplicity, offers a decisive way to strengthen Eco-Marxism, particularly its understanding of the metabolic rift and its political implications. What emerges is a vital project of redistributing subjective capacities for perception and action so that new mappings, orientations, and representations of crisis can be produced. Capitalism, therefore, cannot be confronted from within a single, totalizing world-picture that presents itself as the only "real world" of human existence; rather, it must be challenged from the intervals, fractures, and interruptions between worlds. These pluri-worlds openings expose capitalism's limits while allowing alternative configurations of social and ecological life to take root. Beyond the familiar problem of representation, the contradictory nature of capital also reshapes the internal structure of emancipatory politics, reminding us that global crises always materialize through differentiated local realities. A pluriversal eco-Marxist politics must therefore operate across these heterogeneous worlds, forging solidarities capable of confronting planetary breakdown without erasing the specificity of situated struggles.

For me, it remains the last question: Is that possible Marxism affirm the transcendental philosophy without trapped in Kantian's dogma?

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[35] Rok Benčin, *Rethinking the Concept of World: Towards Transcendental Multiplicity* (Edinburgh University Press 2024), 200-201.

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Neurath, Hayek and ecological planning
The return of the socialist calculation debate in the age of climate change

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Abstract

With climate change and the pandemic concepts like 'war economy' and 'planned economy' have ceased to be relics of the past. This article goes back to the origins of the socialist calculation debate and the notion of incommensurability to show how the initial steps of this century long discussion on the possibilities of planning still bears potential for current discussions on ecological planning. First, it will reconstruct Neurath's concept of "calculation in nature", that is his conception of a planned economy emancipated from price mechanism and based on a politically defined hierarchy of needs. Secondly, it will focus on the neoliberal criticism of the possibility of planning by analyzing Hayek's conception of calculation in nature as the manifestation of an omnipotence of reason, which has no regard for the structural dispersal of knowledge. The last part will assess the utility of Neurath's idea of incommensurability as a viable tool to rethink ecological planning in our age of polycrisis.

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Keywords: Hayek, Neurath, calculation in kind, planning, socialist calculation debate

In the face of the climate emergency and the global pandemic, the debate on planning – understood as an alternative "constructivist" economic-political rationality to the purported neoliberal spontaneism – has regained prominence in recent academic and political discussions (Durand & Keucheyan, 2024; Flipo, 2024; Vettese, Pendergrass, 2022). The unprecedented ecological threat we are facing demands long-term structural investments that allow a rethinking of a market-driven resource allocation and ensure social sustainability within planetary limits. Within this framework, planning re-emerges as a political-conceptual instrument to question the maintenance of capitalist profits indifferent to human and ecological losses (Fraser, 2023), and as a means to reorganize production and consumption so as to reduce carbon emissions. In essence, the goal is to challenge the supremacy of the price mechanism as the universal measure of economic organization and, correspondingly, to contest the skepticism of neoliberal epistemology, which is based on the idea that only individual knowledge is possible. Opposed to this is a political theory oriented toward generating collective knowledge capable of determining general needs without being subordinated to the dictates of market valorization. From this vantage arises a resurgence of the *socialist calculation debate*, in particular the early twentieth-century discussion over "calculation in kind" between the neoliberal thinker Friedrich A. von Hayek and the socialist Otto Neurath, which concerns precisely the relation between knowledge and political action.

The controversy was fomented in 1920s Austria, during the era of Red Vienna (1918-1934) under the governance of the Social Democratic Party of Austria. In that period public housing programs were advanced (with Neurath's participation) and progressive policies improved education, healthcare, and taxation; nationally the eight-hour workday, unemployment benefits, and the creation of the Chamber of Labour as a workers' representative body were consolidated. Moreover, the war had forced the abandonment of laissez-faire, balanced budgets, and the gold standard, opening the way to multiple forms of planning and revealing the deeply political character of capitalist economies. In the face of this politicization – which deactivated the very pillars of the liberal-capitalist order – the

Austrian neoliberals developed a systematic critique of planning and launched their first attacks on Otto Neurath (1882-1945), one of its staunchest defenders.

1. *Neurath's Natural Economy and Calculation in Kind*

Otto Neurath, besides directing the War Economy Ministry during the Bavarian Soviet Republic (1918), headed Munich's central planning office aimed at economic nationalization, and defended socially radical proposals for the time (e.g. a wage for housewives and participation in councils). His central theoretical contribution is *"calculation in kind"* (*Naturalrechnung*), conceived in opposition to monetary calculation: a form of valuation that can do without market categories such as profit, money, and prices. Through his war-economy studies (Neurath 1910, 1916, 1919) he demonstrated how profit could cease to operate as a metric to guide investment and how the satisfaction of needs could assume primacy, offering laboratory conditions for contemporary use–value–oriented approaches (cfr. Uebel & Cohen 2004, 9). Thus, at the beginning of the 1920s Neurath envisaged an economic conception not centered on profit nor coordinated by prices, but oriented to needs, resource rationing, and calculation in kind. In fact, the wartime experience had proved that, faced with vital needs, profit and supply-demand could be suspended as guiding principles, opening a politicization of production and distribution based on a politically defined hierarchy of needs. Although he declared himself an "opponent" of the wartime regime, Neurath maintained that its most effective economic mechanisms could be applied in peacetime to overcome capitalism's crises. The war economy, based not on monetary calculation but on calculation in kind, showed that investment could be guided by needs rather than by profit. Therefore, after the war Neurath announced the demise of the free-market economy and the advent of an administrative economy organized in kind (Neurath 1919/1973). In fact, in his thought, planning and calculation in kind are inseparable: a fully planned economy presupposes the overcoming of monetary calculation.

Neurath characterizes the war economy as a *"natural economy"*: a system without money or markets as allocation mechanisms and with no common unit of account. In its place, decisions are based on the politically determined utility (use-value) of goods and their material availabi-

lity. Prices, in his view, are inadequate coordination instruments because they do not capture real living conditions nor the social and ecological costs of production. They provide no information on effective access to essential services or on the environmental impact of economic activities. The notion of *"decisions in kind"* used by Neurath implies a plurality of measures of value, in contrast to systems that resort to a single unit, be it money, labor, or energy. Prices not only omit fundamental dimensions of welfare, but they also act as a value distorting mask that homogenizes heterogeneous goods (cfr. Lejeune 2024, 25). In the context of the ecological crisis, this homogenization conceals the socio-ecological conditions of production and generates the illusion of universal interchangeability between goods. Neurath therefore rejects not only price as a universal measure, but any single unit that attempts to reduce all economic decisions to a common denominator. His critique extends even to socialist proposals that employ labor time or energy as a general standard. As a matter of fact, calculation in kind does not imply simple barter or physical-equivalence formulas, but rather the construction of an information system capable of describing the material relations among goods and services. It starts from the premise that the dimensions of well-being are incommensurable: an improvement in one area does not automatically compensate for a deterioration in another. Therefore, planning requires a multicriteria analysis that incorporates material and social indicators – such as emissions, public service quality, and pollution levels – rather than limiting itself to cost-benefit calculation. In other words, use-value cannot be reduced to exchange-value.

In his 1925 essay *Socialist Utility Calculation and Capitalist Profit Calculation* (Neurath, 1925), Neurath deepens this critique and anticipates the need for indicators independent of profit and GDP growth. Monetary calculation, he argues, may be precise in terms of money sums, but it is blind to real well-being, public health, just distribution of wealth, and the sustainable use of resources. This is all the more true – Neurath argues – if we consider that profitability in an enterprise can be restored at the cost of hunger or death without appearing as a loss in capitalist accounts. Hence every economic calculation must be oriented to the collective interest in areas such as housing, food, health, and recreation. But there is more: For Neurath, the collective interest is legitimate only if it respects the limits of environmental sustainability – understood as preventing resource depletion and protecting future generations.

But how to calculate the *"best use"* of resources in a socialist order? Calculation in kind has no invariable unit like money, nor can it simply resort to labor-hours as a universal measure. For example, if sustainability is a condition of social utility, labor units cannot adequately record the overexploitation of a mine or the ecological value of a river, since these are incommensurable magnitudes. Therefore, in Neurath's view, the "positive quantities" of socialist calculation differ radically from those of capitalist calculation. For example, from the perspective offered by calculation in kind preserving mountains or forests constitutes a future gain in terms of collective well-being; whereas from the monetary logic perspective, non-exploitation appears *ex ante* as a loss or zero quantity. While the capitalist firm seeks to maximize profit – which makes monetary calculation coherent – a socialist economy aspires to maximize collective quality of life. This requires a utility calculation capable of integrating complex, interrelated dimensions, such as workers' health versus pollution, which the market simply cannot register.

The core of the problem of monetary calculation is that the market fails to capture the relative value of different uses of resources for future generations (cfr. O'Neill, 2021). Exchange based on equivalences presupposes a homogenization that ignores the "non-identity" of goods and contexts of use. Moreover, prices hide the political and social conditions of production and create the fiction of universal interchangeability. What Neurath's reflection suggests is that living beings, places, and temporalities possess value that radically exceeds market prices. This rejection of monetary homogenization extends even to immaterial goods – such as the enjoyment of nature – which cannot be reduced to equivalents.

Given its plural character, calculation in kind cannot fix preestablished units nor yield unique optimal solutions. Resource allocation requires political deliberation and value judgments irreducible to a common metric. Indeed, economic decisions underlying calculation in kind not only compare foreseeable outcomes among incommensurable policies but they also must consider the concrete contexts in which these decisions are to be made. Such incommensurability, together with the irreducible contingency of every single situation which requires a decision on the plan to be implemented, renders any universal abstraction unviable. In this sense, Neurath anticipates some of the main concerns of the future ecological economics: on the one

hand he shows that ignoring production's externalities is costly for future generations, and on the other that environmental sustainability cannot be thought through monetary categories incapable of incorporating ethical and political dimensions.

2. *Hayek's Epistemological Critique*

The planning concept developed by Otto Neurath found its greatest critic in F.A. von Hayek, perhaps the world's most famous neoliberal theorist and founder of the international neoliberal movement Mont Pelerin Society. Hayek attacks Neurath from an epistemological point of view, developing a critique of what he calls the constructivist hubris of modern reason. Hayek's critique of planning developed throughout his intellectual career, attacking in particular the presumption on the part of the social sciences of their ability to construct economic and social order according to a precise design of reason (Hayek 1993, 35-54). In this sense, the neoliberal thinker elaborates a critique of modern reason whose objective is to demonstrate that economic and social planning is a gnoseological impossibility: to assume that the order of society is based on intentional planning is an approach that derives from rationalism, from the dangerous belief that reason makes human beings capable of constructing society from scratch without taking into account its slow and spontaneous evolution (Hayek 1993, 57-78). What Hayek calls constructivist rationalism is based on a "synoptic illusion", that is, on the idea that a single mind, endowed with limited knowledge, possesses all the information relevant to the construction of a desirable social order. However, according to Hayek, no single mind, and therefore no action intentionally directed towards the achievement of a goal, is capable of gathering all the particular facts that are known to some individuals but are not known in their entirety by any particular person.

In two articles published in 1941 and 1942, entitled respectively *The Counter-Revolution of Science* and *Scientism and the Study of Society*, Hayek directly attacks Neurath. First, he criticises calculation in kind, that is, the idea that rational economic choice between two options cannot be based on purely monetary valuations and that instead a direct reference to their physical characteristics is required. This is what Hayek defines as "objectivism" and "physicalism", both intellectual deviations suffered by Neurath. In this sense, Hayek draws a

line of continuity between, on the one hand, rationalism, physicalism and objectivism and, on the other, the socialist project. Behind this epistemological attitude, lies according to Hayek, the idea that the social sciences must eliminate all concepts that cannot be described in physical terms. In other words, objectivism, as conceived by Neurath, implies the elimination of any "mental" concept (Hayek 1942-44, 78). On the contrary, the subjectivism defended by Hayek does not conceive the objects of the social sciences as constituted by physical entities, but by the beliefs and ideas that individuals have about them: «Neither a "commodity" nor an "economic good", nor "food" or "money" can be defined in physical terms but only in terms of the views people hold about things» (Hayek 1942-44, 53). Consequently, calculation in kind would only involve replacing «"artificial" calculation in terms of price or value» with «a calculation which takes explicit account of the objective properties of things» (Hayek 1942-44: 170). It is clear that «the most persistent advocate of [...] in *natura* calculation is, significantly, Dr. Otto Neurath, the protagonist of modern "physicalism" and "objectivism"» (Hayek 1942-44: 170). The problem with this type of calculation is, ultimately, that it eliminates any concept that cannot be characterised in physical terms (e.g., prices), opening the possibility that economic choices will not be based on prices, but will instead be made by direct reference to the physical attributes of objects. Therefore, the objectivism manifested in Neurath's calculation in kind would represent a «particular [...] expression [...] of an illusion about the scope of knowledge and reason which underpins the whole project of socialist planning» (O'Neill 2006, 58).

The key point for Hayek is that behind objectivism lies a presumption typical of engineers, according to which the study of the objective properties of things would allow a purely technical and universally valid optimum to be achieved – in reality, Hayek misinterprets Neurath, who did not have any optimum in mind: on the contrary, he was against any single measure that could establish an optimum. However, the scope of this optimum presupposes the idea that a comprehensive understanding of the economy and the interaction between its actors is possible, which Hayek completely rejects. Indeed, according to the Austrian thinker, human knowledge is structurally dispersed, that is, it cannot be concentrated in a collective entity because it can only be individual, particular, situated and limited to a specific space and time. This is what Hayek defines as the

"division of knowledge", i.e. the dispersion of knowledge and skills among different individuals in society. Therefore, knowledge cannot be concentrated and condensed into a single piece of general information and finally articulated in a propositional form that can be transferred and communicated to a central planning body. The idea that a single planning mind (the engineering mind) with limited knowledge is capable of gathering all the information necessary to create a social order based on social utility is a mere illusion.

Indeed, for Hayek, society and the economy cannot be consciously constructed and subordinated to collective ends such as those found in planning, precisely because society is not a construction, nor the result of a collective decision-making process, but rather a spontaneous order defined as a "cosmos" (Hayek 1993, 35-54), that is, an abstract order, without a defined purpose, within which individuals simply follow rules of conduct. These rules have evolved and been selected throughout history not because they helped to achieve a known end, but because the group that practised them was more successful. For this reason, they do not guarantee the achievement of a specific objective, but simply provide a means of coordination by limiting the scope of permitted actions. Consequently, collective well-being does not consist in the creation ex nihilo of an organisation that establishes a specific collective purpose, but rather in the protection of an abstract order conceived as a simple means for the achievement of a wide variety of individual ends.

This shows how, for Hayek, planning represents nothing more than one of the degenerations of modern reason and its epistemological hubris, of which Neurath is clearly also a victim. In the opinion of the author of *The Road to Serfdom*, only the market can solve the epistemological problem, since it acts as a coordination process which, thanks to the price mechanism, distributes information relevant to the coordination of individual plans among the various economic agents. In other words, only the price mechanism offers a solution to the problem of ignorance. Renouncing monetary calculation, therefore, means renouncing coordination in the market, which leads to unmanageable chaos.

In summary, Hayek criticises Neurath mainly for two reasons. Firstly, for his "physicalist objectivism", which contrasts with his rejection of any reference to the real properties of objects in the natural world, and his rejection of any reference to resource constraints,

which are, however, fundamental to calculation in kind. Secondly, the neoliberal mistakenly projects onto Neurath the belief in the omnipotence of reason that is characteristic of modern philosophy, of which planning is but the ultimate manifestation. As already mentioned, knowledge can only be practical to the extent that it is incorporated into the specific skills and knowledge that individuals acquire through experience. In short, Hayek's argument is not only an attack on the epistemological attitude underlying planning, but also on the entire tradition of ecological economics, which deals with the physical preconditions of economic activity and uses non-monetary indicators to evaluate that activity.

3. *Neurath's Anti-Foundationalism*

In summary, Hayek charges Neurath with a supposed "physicalist objectivism" and with attributing to reason a constructive power beyond its limits. However, this critique rests on a fallacious interpretation. In fact, Neurath equally maintained that human knowledge is fallible, contextual, and incomplete by rejecting unique optimal solutions and absolute foundations. In this respect he famously employed the metaphor of sailors repairing their ship at sea without being able to start afresh from the bottom to express this anti-foundational, dynamic view of knowledge. In this analogy, the ship of science and society is continually rebuilt piece by piece, without ever mooring in a dry dock of certainty. Likewise, Neurath insisted he was the «archenemy of the 'illusion of complete knowledge'» (Neurath, 1945). That's why he rejected the very pretension that Hayek attributed to him – the idea of an all-encompassing, definitive knowledge attainable by reason. For Neurath, since all scientific claims are revisable and provisional, there also can be no «incontrovertible truth for politics» in a world without absolute foundations (Moreno, Serrano 2020, 5).

In a text entitled *International Planning for Freedom* (1942), Neurath opposes what he calls the «technocratic movement», according to which, there would exist «one best solution with its "optimum happiness", with its "optimum population", with its "optimum health", with its "optimum working week", with its "optimum productivity" or something else of this kind [which] asks for a particular authority which should be exercised by technicians and other experts in selecting "big plans"» (Neurath 1942, 426-427). According to Neurath,

precisely because of this impossibility of achieving absolute knowledge about social facts and goals, planning does not involve the use of calculations aimed at achieving an optimum, nor does it crystallise in the definition of a single plan by an isolated group of experts who impose their precepts on the rest of society from above. Rather, it takes the form of the democratic and pluralistic determination of social needs and the development of a multiplicity of plans from which to choose. In other words, precisely because human knowledge has insurmountable limits, it must be constructed intersubjectively and collectively on the basis of the democratic elaboration of needs and ends, of which plans are a crystallisation. Since there is no single rational unit that can reduce decision-making to a purely technical calculation procedure, planning requires ethical and political decisions (cfr. O'Neill 2004, 440).

Thus, while Neurath uses the limits of human reason to demonstrate the need for collective and pluralistic decisions based on the incommensurability of goods and services, Hayek, on the contrary, establishes strict epistemological limits to conclude that economic and social planning is impossible. Hayek decrees the impossibility of collective political action precisely on the basis of this limitation of knowledge and the inability to formulate substantive judgements (about nature, politics, social justice). Such an epistemic limit forces us to trust the market, a sphere that guarantees a kind of space for the condensation of individual knowledge. On the other hand, for Neurath, it is precisely these cognitive limits that make it necessary to develop a democratic construction of knowledge and the dissemination of a scientific culture that allows for planning.

4. *Contemporary Relevance*

In conclusion, Neurath's theory clearly points to a paradigm of degrowth and an anti-productivist logic, offering a wide range of conceptual tools that can help us think about the transition to a zero-carbon economy that prioritises care work over extractive work and recognises the incommensurable value of social needs, as well as social reproduction, as emancipated from the logic of profit. In this regard, Neurath's theory fits perfectly with the description of planning beyond growth offered by Schmelzer, Durand and Hofferberth (2024, 2), according to which «planning beyond growth can thus be

defined as a set of institutions supporting decision-making processes based on biophysical and social indicators and driven by deliberately established social and ecological targets». Indeed, the key to an anti-neoliberal repoliticisation of the economy and the environment is to consider economic decisions as political problems, which implies overcoming the idea of a universal criterion for measuring all activities. Possible ecological planning today undoubtedly requires the application of calculation in kind to integrate a multiplicity of quantitative objectives, which have to do with ecological limits, and qualitative objectives, which refer to quality of life. The latter could be set taking into account carbon quotas, maximum limits on the exploitation of natural environments and other indicators on access to housing, healthcare and education.

However, the challenge we face is not only crucial given the urgency of the climate disaster, but also requires a profound rethinking of our political and economic categories. In this regard, if we want to update Neurath's proposal, we must ask ourselves some questions: how can we build this collective and democratic knowledge today, based on different and incommensurable possibilities of allocation, of which plans are the crystallisation? How should we imagine the articulation between "science" or "expert knowledge" and "democratic knowledge"? Which subjects or political entities should decide on the different plans? In other words: who are the subjects that determine needs? Although we do not yet have clear answers to these questions, there is no doubt that returning to the philosophical-economic debate on calculation in kind is of paramount importance for imagining a society capable of valuing the incommensurability of goods beyond the monetary homogenisation that is leading us into the abyss of a climate catastrophe.

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Western Marxism, Nature and Ecocriticism

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Abstract

This paper examines the shifting role of environment and "nature" in contemporary aesthetic theory and literary criticism, tracing a trajectory from early modernity to current postmodern and ecocritical debates. It argues that evolving meanings of nature are inseparable from capitalist contradictions and epistemic ruptures. The emergence of modern epistemology and the sciences – alongside philosophical contributions of Kant, Hegel, Marx and others – reshaped subject-object relations, redefining aesthetic and sensorial fields, enabling new literary forms, and assigning new ideological functions to nature. Twenty-first-century ecocriticism, drawing on postmodern neo-materialist philosophies, dissolves the modern subject but risks reproducing forms of capitalist reification. Marxist aesthetics, overlooked within ecocritical discourse, offers tools for understanding the concept of nature as a historically and socially mediated relation, grounding environmental literary studies in material conditions.

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The modern aesthetic and literary criticism begin to take shape around the mid-eighteenth century, in the decades preceding and following the French Revolution. Starting in these years, Enlightenment

and Romantic reflections arise that challenge the Cartesian, mathematical, and abstract logic that had emerged with the Scientific Revolution. From classical antiquity to the humanists of the seventeenth century, the study of literature was primarily dedicated to verifying compliance with the norms derived from Aristotle's *Poetics*. With Romanticism and the birth of the novel, artistic theory gradually gave way to a critical function of literary studies[1]. The aesthetic object is no longer valued for its imitation of a nature created by the Christian God; rather, it becomes a product of human activity, and as such can be understood by the critic through the human sciences. The role of the intellectual – especially from the pedagogical standpoint of the Enlightenment – was therefore also to make works accessible to the new public of modern societies, the bourgeois masses.

This transition toward aesthetic criticism and modern art is grounded in a new, secularized vision of reality. Thinkers such as Bacon, Galileo, and Newton had already sought causal links among phenomena within the relations between objects rather than in a transcendent realm; yet their method remained abstract in its Euclidean geometrical and intellectual structures. The critic of the scientific method would be carried forward by the Enlightenment, and find its fullest philosophical definition in Kant. Humanity proved capable of reflecting on its own thought, and thus of questioning how the intellect comes into contact with reality. As this opposition between subject and object becomes manifest, we would find a theoretical solution only in the nineteenth century, thanks to the movement imparted to philosophy by Hegelian dialectics and its inversion in the praxis by Marx.

Within few centuries, from Copernicus to Charles Darwin, millennia-old fixist conceptions collapse, and so too do economic doctrines tied to seasonal cycles and feudal agriculture, such as physiocracy when confronted with classical economy. At the same time, the human sciences and earth sciences (geology, biology, etc.) emerge. It is a moment in which ancient truths begin to falter, and among the truths shaken is the very conception of nature.

The Cartesian distinction between *res cogitans* and *res extensa*, followed by the spread of deism among the enlightened bourgeoisie, had already dealt a severe blow to the vision of a transcendent natu-

[1] See Ferrone V. (2019), *Il mondo dell'Illuminismo. Storia di una rivoluzione culturale*, Torino: Einaudi.

ral world governed by divine laws. Starting from Vico[2], historicism would introduce the relativity of space and time (into aesthetic and literary values as well): categories (such as beauty and ugly, interesting and pleasant…) cannot be replicated identically in every place and time, and even universals must confront themselves with particular necessities.

Modern thought and modern art, therefore, arise from the oppositional confrontation between the bourgeois subject and a reified object. From this contradiction, the term *nature* begins to acquire new, contradictory meanings that no longer indicate the creation of medieval theology, but instead represent what is considered the necessary truth of reality: what is natural is true and thus worthy of imitation, and individuals and societies must adhere to its laws to avoid misfortune and crisis.

The formation of opposing meanings of nature at the level of ideas reflects a split that is occurring in the structures of concrete and material reality. On the one hand, nature is seen as "the sum of the laws"[3], encompassing the laws of mathematics and classical economics, the tolerance accompanying free trade according to Voltaire and Turgot, and the rights to property and individual liberty in natural law theory; on the other hand, it appears as the natural rising movement of the circulation of commodity and labor, of the exchanges between centers and peripheries, and of the mechanization of labor. Capitalist society emerging in Europe and in the European colonies based its rise simultaneously on fixed, immutable laws and on the progressive setting-into-motion of all earthly elements. The polysemy and schizophrenia that the term *nature* assumes in modernity derive from the need to render as a natural unity these two contradictory elements.

Even aesthetic representations of what is defined as nature take on a contradictory meaning. On one side, we find reasonable and tolerant characters, open to progress and strong in moral pedagogy, enterprising but still respectful of religious and civic authorities[4]. Their stories are

[2] The first edition of the *Scienza Nuova* is from 1725.

[3] Lukács G. (2021), *History and Class Consciousness*, Paris: Foreign Languages Press, p. 266.

[4] In *La Nouvelle Héloïse* Rousseau depicts the inhabitants of Clarens as industrious and morally upright workers, whose daily actions unite productive labor and civic virtue; similarly, in the *Lettres persanes* Montesquieu uses Usbek's observations to praise the moderation and rational conduct of European bourgeois society.

realistic, depicting the seriousness of daily labor, and the classical world remains for a long time the environmental model of a society in harmony with nature – like in the symmetry revived by the neoclassicism of David, the painter of the 1789 Revolution. Figures thus seek sobriety and the purity of beauty, opposed to rococo excess and the idleness of tragedy. This conception of nature mainly manifests the ideological relation of the new working petty-bourgeois class, which earns through activity and is interested in abolishing feudal rent[5], and reality.

On the other hand, nature resides in the volatility of passions, including their dark and negative sides. It can take any forms, even monstrous ones, like those excluded from the Mediterranean canon of beauty, such as medieval Celtic and Germanic traditions (constitutive of linguistic and national identity for the conservative Romanticism). Precapitalistic not anthropized forests (the *Wald*) become an allegory for the formative and mythological experiences of the great individual unfold, like in the Grimm tales and in the Wagnerian sagas[6]. This is a *natura naturans*, whose principle is the chaos governing the world, ungraspable by reason, appearing to humans as a vortex of indistinct processes, and which needs to be dominated by the genius. Thus, everything real naturally exists and has dignity in any form, from the highest moral peaks to the lowest abjections (like the libertine passions). This will also be the wild nature met in the adventures beyond the frontier, at the end of seas and of railways – the great spatial metaphors of modernity (e.g., *Moby Dick*, the Western movies).

As Marxism would understand, the conflict between these two natures in the realm of ideas and literature can only be resolved through a revolutionary transformation of the conditions producing that conflict in the material world[7]. For example, Adorno[8] observed how the formation of the modern subject is from its outcome intertwined with an immanent split between external nature and internalized na-

[5] This same idea of nature will be reactivated by US liberal progressivism too, like in John Ford's *Young Mr. Lincoln* (1939), where young Lincoln has not become president and abolished slavery, but he is already a moral model for the nation.

[6] See Lowy M. and Sayre R. (2021), *Romantic Anti-capitalism and Nature. The Enchanted Garden*, London & New York: Routledge.

[7] Of course, always in a dialectical relationship among all the elements of totality.

[8] See Horkeimer M. and Adorno T. (2002), *Dialectics of Enlightenment. Philosophical Fragments*, Stanford: Stanford University Press.

ture. The bourgeois subject is compelled to constitute itself through the domination of its own nature, and this domination produces a fractured subjectivity that is directly reflected in literary forms. Young pre-Marxist Lukács too, in *The Theory of the Novel*, had linked the fate of the novelistic character to the loss of an original unity between human beings and the world. Within the capitalist system, the subject is therefore destined to oscillate between two irreconcilable literary imaginaries, often leading to tragic outcomes for characters (as for Werther or Anna Karenina).

Not only contents express the new capitalist life, but forms themselves are radically transformed. Once the aristocracy's extreme defense of seventeenth-century tragedy is overcome, the novel imposes itself as the hegemonic literary form in few decades, disrupting all previous narrative hierarchies. The novel is characterized by a mixture of styles and characters from different categories. Even a maid like *Pamela*[9] can become the protagonist of a serious story in the bourgeois society, where the authors are now free to treat any character as they wish. The noble may be lowered to the comic tone and the peasant raised to the tragic, because these are the new fluctuating social relations that inspire writers, and because this is what a growing segment of the market – new classes who want to read about themselves – desires.

During the nineteenth and twentieth centuries, the active subject – coinciding with the bourgeois figure, the highest rank of a patriarchal and colonial society now divided in national States – identifies and classifies as natural object everything considered different from himself. This process of naturalization relegates subaltern subjects (both non-human and human) to a condition of functional duality serving the bourgeois interests of domination and exploitation, whose ultimate necessity is the realization of private profit. Nature may be a pastoral and bucolic refuge where the *boni mores* of tradition are preserved; restful and refreshing for workers exhausted by the competition of chaotic, increasingly polluted industrial cities. But center and periphery – the geographical form of the class antagonisms – may also invert their values, opposing orderly, civilized, secularized urban environments to the boundless, chaotic, monstrous, and non-anthropized spaces of wilderness.

[9] *Pamela: or, Virtue Rewarded* by Samuel Richardson is an epistolary novel published for the first time in 1740 (now in London: Penguin Books Ltd 2003).

Human characters, despite changing hierarchies, are not free from social conditioning. Just as extra-human nature has become wild and dangerous or idyllic and pure, human groups taxonomized as natural suffered the same fate. Women and characters marked by femininity were therefore forced into a dual identity: demonic creatures to be conquered, humiliated, or destroyed – satisfying the proprietary desire of the one active subject – or sources of regeneration and purification within the domestic space, offering rest and care to the worker exhausted by the *bellum omnium contra omnes* of capitalist competition. The emergence of capitalism is dialectically linked not only to the rise of modern patriarchy, but also to colonization. Urbanization, the transfer of political and economic power from the feudal countryside to Western cities – dominated by commerce, crafts, industry, finance – , together with the European appropriation and exploitation of Africa and the Americas, transform the global landscape through imperialistic logics. Literature soon projected its desire for reconciliation with nature onto exotic and distant worlds. Hand in hand with colonial conquest, the figure of the savage entered Western literature, either as noble, innocent and pure or as a primitive, brutish, and infidel creature. Naturalization of colonial and sexual alterity as savage reproduce the same semantic split: a dangerous being negating Christian values, to be dominated and destroyed, or an idealized, sentimental figure onto which pre-capitalist virtues are projected.

With the end of Marxist cultural hegemony and the rise of post-structuralism and postmodernism, the dualist architecture which sustained modern thought is subjected to criticism. Donna Haraway begins her seminal *Cyborg Manifesto* from the contemporary "boundary breakdowns"[10] between Man and Nature, Nature and Culture[11], Woman and Machine…. The abolition of the modern oppositions restructures the entire ontological field, shifting from a vertical model to a horizontal one. In late postmodernity, methods proliferate that annihilate the subject into a *flat ontology*, made of "literally […] nothing but networks"[12] distributed rhizomatically across

[10] Haraway D.J. (2016a), *A Cyborg Manifesto. Science, Technology, and Socialist-Feminism in the Late Twentieth Century*, Minneapolis: University of Minnesota Press, p. 10.

[11] See also Descola P. (2013), *Beyond Nature and Culture*, Chicago: The University of Chicago Press.

[12] Latour B. (1996), 'On actor-network theory: A few clarifications', *Soziale Welt*, 47. Jahrg., Heft 4, pp. 369-381, p. 370.

a surface, erasing contradictions. Latour's model of hybridization often resembles more to the communication and transport networks of global capitalism rather than to a socio-political project. Haraway, by contrast, in theorizing "companion species"[13] avoids collapsing into capitalist horizontality, and acknowledges other determinants of crisis and inequality[14]. More generally, there is a spread of neo-materialist philosophies, emerging partly from an irrationalist tradition and opening the way to a proliferation of vitalist works, "often in the name of ecology, in which a universal animism is the outcome. […] A common strategy to be found in Latour, Bennett, and Morton is to negate Marx's famous critique of commodity fetishism by simply standing it on its head, presenting all things/objects as vital agents or actors. This amounts to a universalisation of commodity fetishism and reification (the thingification of the world), and the diminishing thereby of any notion of the human subject. It constitutes the elimination of the classic conception of critique"[15].

Marxist studies of the 90s have shown the link between the diffusion of terms semantically related like hybridity, mobility, nomadism, posthumanism, and the economic-political shifts in the West which started in the 1970s.[16] This marked the transition from industrial manufacturing economies to service- and finance-based ones, detaching workers from the rigid hierarchies of industry and adapting them to new global-labour-market demands for flexibility – further fueling that process of abstraction and motion which, in Marx's terms, corresponded to volatilization and de-realization. As Terry Eagleton wro-

[13] "The category companion species helps me refuse human exceptionalism without invoking posthumanism." (Haraway D.J. (2016b), *Staying with the Trouble. Making Kin in the Chthulucene*, Durham & London: Duke University Press, p. 13).

[14] For example Plantationocene, but "still, if we could only have one word for these sf times, surely it must be the Capitalocene. Species Man did not shape the conditions for the Third Carbon Age or the Nuclear Age. The story of Species Man as the agent of the Anthropocene is an almost laughable rerun of the great phallic humanizing and modernizing Adventure, where man, made in the image of a vanished god, takes on superpowers in his secular-sacred ascent, only to end in tragic detumescence, once again." (Haraway Donna J., *Ibidem*, p. 47).

[15] Bellamy Foster, J. (2023), 'The New Irrationalism', *Monthly Review Online*, vol. 74, n. 09, February. Available at: https://monthlyreview.org/articles/the-new-irrationalism/.

[16] Cfr. Harvey D. (2005), *A Brief History of Neoliberalism*, Oxford: Oxford University Press.

te, no form of life in history has had the same "Faustian horror of fixed boundaries, […] has been more in love with transgression and transformation, more enamoured of the hybridity and pluralistic than capitalism".[17] Marxist theory, in order to resolve and abolish the contradiction between human and nature, asserts the need for a practical solution in productive and reproductive relations. Only in a socialist ecological order "fully developed naturalism equals humanism, and […]fully developed humanism equals naturalism", as envisioned by Marx in the 1844 manuscripts.[18]

Literary criticism has reacted to the ontological turn by adopting new methods.[19] More generally, literary criticism begins to address the environment explicitly in the 1970s, with Joseph Meeker's *The Comedy of Survival*[20], considered the first ecocritical study, and Raymond Williams's *The Country and the City*[21], arguably the first Marxist literary-environmental work. In the 1980s, when ecocriticism emerges and spreads in U.S. universities, scholars focus primarily on non-anthropized space. The majority of these studies draws on dualistic conception of a pure nature to be preserved out of moral respect by industrial pollution.[22] Ecocriticism grows in the 1980s and 1990s, when Western economic growth reposed on late-cycle financial expansion[23], and neoliberal authoritarian turns brought about the decline of the long '68 movements. This conjuncture fostered the spread of idealistic, transcendent, post-ideological, and post-religious philosophies. The retreat into private

[17] Eagleton T. (2003), *After Theory*, New York: Basic Books, pp. 118-119.

[18] Marx K. (1988), *Economic and Philosophic Manuscripts of 1844 and the Communist Manifesto*, New York: Prometheus Books, p. 102.

[19] See Westphal B. (2011), *Geocriticism. Real and Fictional Spaces*, New York: Palgrave MacMillan.

[20] See Meeker J. (1997), *The Comedy of Survival: Literary Ecology and a Play Ethic*, Tucson: University of Arizona Press (first published by Charles Scribner's Sons 1974).

[21] See Williams R. (1993), *The Country and the City*, London: The Hogarth Press (first published by Chatto & Windus 1973).

[22] Cfr. Slovic S. (2010), 'The Third Wave of Ecocriticism: North American Reflections on the Current Phase of the Discipline', *Ecozona*, vol. 1, n. 1. And see also Jemima Asenath T., Santhanalakshmi A. and Jebakumar M. Franklin Samuel (2019), 'Eco-criticism: A critical overview of ecological Literary Theory', *JETIR – Journal of Emerging Technologies and Innovative Research*, vol. 6, n. 6.

[23] Cfr. Arrighi G. (2010), *The Long Twentieth Century: Money, Power and the Origins of Our Times*, London-Brooklyn: Verso.

life and interiority encouraged the diffusion of philosophies like *New Age*, *Deep Ecology*[24], or other ideas imported from a vague "East" (e.g., late Beat generation's Buddhism).

The major theme of first-wave ecocriticism was wilderness, drawing on the American Transcendentalist tradition (Walt Whitman, Henry David Thoreau, Ralph Waldo Emerson…).[25] From the 1990s onward, following critiques of wilderness[26] and, more generally, of anthropocentrism as a root of ecological crisis, a second wave of ecocriticism abandons the elegiac, idyllic tone of its predecessor. Between the two millennia, gaining growing academic and editorial traction, ecocritical studies increasingly focus on hybridizations between human and non-human, masculine and feminine, rural and urban, incorporating anthropized and urban environments into their framework. Second wave ecocriticism grounds its conception of nature in opposition to the dualist paradigm, using new-materialist theoretical tools. Thus, the concept of nature is inverted: from total separation between humanity and nature to substantial unity[27].

Ecocriticism has not deeply engaged with the tradition of Marxist aesthetics, despite the centrality of nature in those debates. Marxist aesthetics has traditionally undertaken a critique exposing the naturalized appearances under which social relations manifest themselves in capitalistic age. Realism, in the Marxist tradition, means above all representing the real non-ideologically, representing social relations in their true commodified forms (e.g., like they appear in Brecht's theatre). Marx and Engels had already seen this capacity in Balzac's woks, before Lukács constructed his more systematic theory of critical realism. In one of his foundational works of Marxist aesthetics[28], György Lukács cites Marx's discussion of *Stoffwechsel* to define "me-

[24] Cfr. Naess A. (2005), 'The deep ecology movement: Some philosophical aspects', in *Selected Works of Arne Naess*, vol. X, Dordrecht: Springer, pp. 33-55.

[25] Cfr. Buell L. (1973), *Literary Transcendentalism: Style and Vision in the American Renaissance*, Ithaca: Cornell University Press.

[26] See Cronon W. (1996), 'The trouble with wilderness: or, getting back to the wrong Nature', *Environmental History*, vol. 1, n. 1, pp. 7-28. See also Mies, M. & Shiva, V. (2014), *Ecofeminism*, London & New York: Zed Books.

[27] Cfr. Malm A. (2018), *The progress of this storm. Nature and Society in a Warming World*, London-Brooklyn: Verso.

[28] The following quotes are translated by the author from the two volumes of Lukács G. (1963), *Estetica*, Torino: Einaudi (first published by Herman Luchterhand Verlag GmbH 1963).

tabolic exchange with nature" as, "in the final analysis", what "art reflects"[29]. His orthodox Marxist methodology distinguishes between the disanthropomorphizing activity of science and the "anthropomorphizing character" of art[30]. Scientific reflection, as a disanthropomorphizing practice, should strive to "reproduce the facts of reality, […] excluding, as far as possible, the influence of human subjectivity on research, selection, and arrangement."[31] Conversely, art involves a projection from the inside outward, from humanity into nature, and in this sense both artistic production and "the worship of animals and natural forces" or the "creation of anthropomorphic deities"[32] are anthropomorphizing too. For Lukács, art can never completely escape anthropomorphizing processes: the artistic object contains an element of human making and can only be grasped through human sensibility. Reconsidering Marxist definitions of the dialectic between art and metabolic cycles can help illuminate the blind spots of contemporary methodologies, which often confine themselves to the cultural plane rather than engaging with the totality of historical processes. At the same time, this revision imposes to critically interrogate traditional frameworks, especially considering theories that have reexamined the dialectic between exploitation and domination, between the moment of extraction of surplus value and the moment of appropriation of added resources. As Jason Moore emphasizes, the value produced by human labor and recognized by the capitalist system through wages can only be realized if Nature is rendered available for exploitation through processes of reorganization and appropriation within the ecological regime of Capitalocene[33]. If the value is realized through the moments of production and appropriation, Marxist ecocriticism could begin by examining the measures and modes through which these processes affect the conditions of production and reproduction of art itself, and how such conditions are represented in the aesthetic object.

[29] Lukács G., *ivi,* p. 197.
[30] Lukács G., *ivi,* p. 176.
[31] Lukács G., *ivi,* p. 182.
[32] Lukács G., *ivi,* p. 178.
[33] See Moore J.W. (eds.) (2016), *Anthropocene or Capitalocene. Nature, History and the Crisis of Capitalism*, Oakland: PM Press.

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From Capitalist Sustainability to Planetary Habitability: A Chakrabartian Perspective

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Abstract

This article examines the shift from capitalist sustainability to planetary habitability as a necessary reframing for interpreting the Anthropocene. It argues that sustainability, rooted in global and human-centered developmental logics, cannot address the convergence of human and planetary histories that emerges once humanity becomes a geological agent shaping Earth system processes. Drawing on Chakrabarty's work and insights from Earth system science and political theory, the analysis reconsiders the limits of Marxian and postcolonial critiques focused primarily on socio-economic categories. The results show that capitalist sustainability remains confined to a managerial horizon centered on resource renewal for human societies, whereas planetary habitability requires preserving the broader conditions that enable complex life. This reconceptualization expands the analytical focus beyond economic structures to include planetary conditions of life and population-level dynamics, reframing humanity in light of a species-level warning. Finally, the article concludes that addressing the Anthropocene demands an ethical and ontological framework oriented toward sustaining long-term planetary habitability.

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Keywords: Capitalist Sustainability, Planetary Habitability, Anthropocene, Chakrabarty, Arendt

In this paper, I would like to address the issue of the relationship between capitalism and the Anthropocene based on the difference between the question of sustainability and the question of habitability. To do so, I take as a reference the reflections of Dipesh Chakrabarty, who before being a scholar of the Anthropocene was a historian of postcolonialism and globalised power dynamics.

He had in fact become famous for the book *Provincializing Europe* (Chakrabarty, 2000), where he noted that Europe and Europeans were not the only elements of modernization, but also the set of intellectuals from late modern countries (India itself) who had grasped and favored universal traits in European and Western ideas in general (mythologizing them). This book was part of the reflections of social criticism and the discovery of the undergoing dynamics of power in human history, in particular linked to post-colonial issues.

In 2009, however, Chakrabarty published a famous article, entitled *The Climate of History: Four Theses*, in which he stated that all of his studies about postcolonial theory, deriving in various ways from Marxism, were revealed to be inadequate to understand the profound dynamics of the Anthropocene, that for him is first and foremost the epoch in which human history and planetary history converge.

Without wanting to provide a further definition of the Anthropocene here,[1] which has been widely discussed in this book, I will only point out the fundamental "historical" element of this new epoch for Chakrabarty. It is no longer possible to think of human history and natural history, now planetary history, as something separate, according to the humanistic conception dominant in modernity.[2] Now that *Homo sapiens* has become a "geological agent" (Chakrabarty 2009, 206), that is, one that intervenes in the deep processes of the Earth, natural history is no longer an independent path. However, at the same time, human history itself is no longer independent of natural history (now understood as the history of

[1] On this point, see among others Steffen et al. (2011, 843): «human imprint on the global environment has now become so large and active that it rivals some of the great forces of Nature in its impact on the functioning of the Earth system».

[2] Se Chakrabarty (2009, 201): «anthropogenic explanations of climate change spell the collapse of the age-old humanist distinction between natural history and human history».

the Earth system), such that it can no longer be thought of as relating only to humans, who until now have dominated natural entities for their exclusive use and consumption (living beings, landscapes, ecosystems).

An environmental ethicist like Clive Hamilton, in the book *Defiant Earth* (2017), speaks of the fact that the rupture caused by the Anthropocene in planetary history is at the same time a rupture in human history, and this rupture is represented by the fact that for the first time along the 4,5 billion years of Earth's history, "volition" has been introduced in the blind processes of nature.[3] Or, one could say, for the first time a living being has become capable of modifying the profound evolution of the Earth system and has the possibility of exercising or retaining this power.

This historical shift forces us to think, according to Chakrabarty, no longer only in terms of human reference, of that "global" which is the consequence of globalization (as a result of modernity), but requires us to think in "planetary" terms, that is, of the joint effects of our action on the planet as Earth system and of the feedback that it now forcefully applies to our human processes. The neutral background of our development, which for more than 10,000 years has allowed civilization to flourish (in the Holocene), is now disrupted and reactive (even threatening), without us being able to dominate it as we do with living beings, landscapes and ecosystems.

This passage from the global to the planetary, which our understanding must first of all make, also represents a passage in terms of human concern and conduct from the theme of "sustainability" to that of "habitability". With sustainability, a term that has dominated environmentalist appeals of the last fifty years, we mean the primarily human reproducibility of certain processes and the renewal of resources in view of the needs of future generations, according to the same definition of the United Nations.[4]

[3] See Hamilton (2017, 5-6): «This new "force of nature" contains something radically different – the element of volition. Global anthropogenic impacts, such as increases in carbon dioxide in the atmosphere and disturbance to the nitrogen cycle, do not just happen but are consequences, intended or otherwise, of *decisions* taken by human minds».

[4] See World Commission on Environment and Development (1987).

By habitability, following the reflections of scientists such as Langmuir and Broecker,[5] Chakrabarty in *The Climate of History in a Planetary Age* (2021) means the possibility of preserving a set of conditions that are favorable to complex life, in which humanity is included but is not the exclusive reference. According to this reading, then, sustainability is primarily aimed at humans and therefore manifests a *global* character, while habitability is aimed at life and its conditions of existence, and therefore manifests a *planetary* character.[6] Habitability means preserving the conditions of existence of complex life, including humans, and concerns the possibility of a civilised species such as ours to inhabit a planet over time. The opposite of the idea of *overshoot*, at least as understood by Catton (1980, 96-97), who refers to it as «instances in which populations of organisms so changed their own environments that they undermined their own lives».

This conceptual change, briefly exposed, also impacts the way in which we must relate to the problematic of advanced capitalism, that is indeed largely the cause (with the "great acceleration") of the anthropogenic upheaval of the Earth System,[7] that takes us beyond the "planetary boundaries" of the Holocene,[8] but cannot be thought apart from the planetary history that the Anthropocene event brings to converge with human history.

This means that capitalist reasoning on the possibilities of exploiting nature, already identified by Marx as not infinite,[9] must be challenged no more in terms of their renewal and sustainability, but requires to be replaced by a new paradigm as much ontological as ethical that focuses on the habitability of the planet.

[5] See Langmuir and Broecker (2012, 650): «Does such a civilization self-destruct in a few hundred years or last for millions of years? For such a civilization to last, the species driving the technology must [consciously and collectively] sustain and foster planetary habitability rather than ravage planetary resources». As recalled by Chakrabarty (2021, 88).

[6] See Chakrabarty (2021, 83): «The key term in planetary thinking that one could contrapose to the idea of sustainability in global thought is *habitability*. Habitability does not reference humans. Its central concern is life – complex, multicellular life, in general – and what makes *that*, not human alone, sustainable. […] The questiona t the center of the habitability problem is *not* what life is or how it is managed in the interest of power but rather what makes a planet friendly to the continuous existence of complex life».

[7] On this point, see Steffen et al. (2015).

[8] On this point, see Rockström et al. (2009) and Richardson et al. (2023).

[9] On this point, see Burkett (1999).

Here, however, Chakrabarty distances himself from the main currents of Marxist criticism, refusing to reduce the planetary crisis to a crisis of capitalism (or to a specific trait of it), while recognizing its undeniable contribution to it.[10] This is not so much because even the realities of the so-called "real socialism" have exploited natural resources with the same ruthlessness (think of the Soviet Union first and foremost), but because the epochal change of the Anthropocene cannot be reduced to a crisis of modernity, that is, to an exclusively human history, in which socio-economic crises follow one another.

Now that the convergence between human history and planetary history has occurred, it is no longer possible to exclude the Earth system and its historicity from the understanding of human dynamics. This means introducing at the same time the theme of the species, which emerges as a "red alert" in this situation at risk of extinction.[11] If capitalism was in fact a change of power, in enormous qualitative and quantitative terms, the dynamics of exploitation and destruction of living beings, landscapes and ecosystems are atavistic in the history of *Homo sapiens*.[12]

A narrative of exclusive opposition to capitalism is therefore not adequate to the Anthropocene scenario, not because capitalism is not to blame but because the scenario has gone too far beyond a crisis with global socio-economic features and concerns the planetary theme. Not the sustainability of a system or a civilization but the habitability of a planet. Responding now with an exclusive criticism of capitalism (and all the partitions of humanity between industrialized and non-industrialized states, instead of thinking of the human totality as a "population"), does not allow us to understand and therefore be able to counteract the most dramatic effects of the Anthropocene.

[10] See Chakrabarty (2009, 221): «Climate change, refracted through global capital, will no doubt accentuate the logic of inequality that runs through the rule of capital; some people will no doubt gain temporarily at the expense of others. But the whole crisis cannot be reduced to a story of capitalism».

[11] Chakrabarty (2009, 221) refers to the category of species as a "placeholder": «Species may indeed be the name of a placeholder for an emergent, new universal history of humans that flashes up in the moment of the danger that is climate change».

[12] Consider, for example, the extinction of the Australian or North American megafauna, brought about by humans tens of thousands of years ago, even without the technological means and social organization associated with capitalism. On this point, see Diamond (1997).

Consider, as instance, the marxist pivotal theme of redistribution about the means of production. If today the system of concentration of economic resources aimed at material well-being achieved in advanced countries, in terms of production and consumption, were to spread globally, we would not have an improvement in anthropogenic climate change but a significant worsening. The dramatic presence of a mass of poor people globally, unable to consume like a Westerner, prevents the overshoot of the planet from being further accelerated.[13]

In the face of this epochal change, and given the need for a new understanding of the ecological crisis, Chakrabarty (2021), recalls among others the thought of Hannah Arendt, in particular the references to the politics of *plurality* (something collective that exists between human beings) and to the distinction between "labor", "work" and "action".[14] Starting from here, I would like to briefly present my reading of this call, which in Chakrabarty's book is not oriented to present an alternative theory.

In this view of habitability, the Arendtian themes of "labor" and "work" come together and the conditions of possibility of our vital reproduction are intertwined with the conditions of intergenerational reproducibility of work. Initially, labor was concerned with human reproducibility in terms of the primary existence of individuals, and work was understood as that which allowed the sustainability of human society over time, and therefore something we can connect to the level of the "global".

[13] See Chakrabarty (2014, 11): «Such a world would undoubtedly be more egalitarian and just – at least in terms of distribution of income and wealth – but the climate crisis would be worse! Our collective carbon footprint would only be larger – for the world's poor do not consume much and contribute little to the production of greenhouse gases – and the climate change crisis would have been on us much sooner and in a much more drastic way. It is, ironically, thanks to the poor – that is, to the fact that development is uneven and unfair – that we do not put even larger quantities of greenhouse gases into the biosphere than we actually do. Thus, logically speaking, the climate crisis is not inherently a result of economic inequalities – it is really a matter of the quantity of greenhouses gases we put out and into the atmosphere».

[14] See Chakrabarty (2021, 8): «Readers of *The Human* Condition will remember that Arendt identified the human capacity for making use of individual differences – in her terms, *plurality* – to create the new or the novel in human affairs as the source of "action". "Action" is foundational to her definition of the political. Action, Arendt wrote, "corresponds to the human condition of plurality, to the fact than men, not Man, live on earth and inhabit the world"». The reference is to Arendt (1958, 175).

With the Anthropocene and the irruption of planetary history into human history, that is, with the jeopardy of the conditions of existence of complex life in general caused by humans, the way to preserve both vital reproducibility and social sustainability over time becomes strictly connected to planetary habitability. Not only as a threat, but also as an effect of our action, which no longer concerns only human times but the deep times of the Earth system. Vital reproducibility useful to human history is therefore at the same time connected to ecosystems, and also to the natural processes of non-living entities (for example ocean currents), while social sustainability bases its continuation over time on choices that affect not only current generations but also more distant future generations, having consequences for millennia. In the Anthropocene, therefore, the function of labor and that of work are united on a deeper and broader level.

While for Chakrabarty the human being has always been a "biological agent" and in central aspects a "social agent", for the first time with the Anthropocene it becomes a "geological agent" or, I could say, a *planetary* agent (given the rejection of geological stratigraphy by the international commission in 2024).[15] That is, it extends its power of disruption and its responsibility for the consequences to the deep dynamics of the Earth system. Its "action" no longer has to do only with individuals and their relationships, but as a population it concerns the very conditions of life on the planet.

The Marxist "base"[16], therefore, must be extended beyond economic conditions to biological ones, as opposed to the "superstructure" of exclusively social conceptions, which do not consider the red alarm *species* that emerged with the Anthropocene. The social character of the human being, which Marxianly derives from his basic economic condition and from the power relations with other humans, is now inscribed in a broader dynamic of planetary habitability, that is, of preservation of the essential conditions of life that allow any society to survive (capitalist, communist, or socialist one). I could call this the real "sub-structure", essential for a base to continue to exist and give life to superstructures. Therefore, what was initially a display of the underlying power dynamics that enslave and alienate human beings

[15] On this point, see Voosen (2024), Witze (2024), Zhong (2024), and Carrington (2024).

[16] See Marx (1859).

from their own freedom, now risks obstructing the view with respect to a broader and more pernicious issue that concerns the entire species, or at least the human civilization.

Here we need to reason starting from the superstructure, from the grand narrative of structural and sub-structural relationships. That is, we need a change of thought that guides a pivotal shift in the millenary history of humanity, at least from the birth of agriculture to today. A change about the type of ethical and ontological relationship with nature, now understood as the Earth system. We need to overstep a conflict between classes that poses a distinction among humans that is far too detailed (although some say it is too broad), compared to that needed for the theme of "population", the authentic actor in the joint human-planetary history of the Anthropocene.

In this view, arriving at a thought that holds together with the social-working aspect the natural-living one, requires abandoning the idea of a global sustainability that only looks at the human level, still identifying the community in the economic-managerial view of something available (the population understood as the forest, to be managed and exploited instead of endowed with agency). In an attempt thus to come to assess as primary, for the humans and not only, the theme of "planetary habitability". Only once this issue is recognized as primary and the population accepted as the authentic subject upon which to act, then we activate a process of *caring* for the entire Earth system in terms of "conditions of life", as the essential sub-structure of our society. Not just for us, as present humanity, but also for other life forms that are not capable of acting against the ecological crisis and the real threat of extinction: non-humans and future generations.

Caring for this new planetary substructure (the conditions of life within the Earth system, or its habitability) means reflecting beyond the "metabolic rift" recognized by Marx as proper to capitalism.[17] What capitalism has brought to light is not merely a crisis in the relationship with nature concerning this specific period in human history (the modern period), but a problem in the relationship with nature that concerns the entire history of humanity, understood as civilization or even long before. When the red alert "species" is blinking, we cannot focus only on the last two hundred years of history, on the most recent modes of production, distribution, and consumption.

[17] See Marx (1981). On this point, see also Foster (2000).

We need to analyse our entire relationship with nature, our ontology as a globalized Western society (in particular), and the way in which we consider – or fail to consider sufficiently – the theme of population that drive planetary dynamics.

The questions we now have to ask ourselves are not simple as the following one: how do we stop capitalism, which is leading us to global destruction, in order to solve ecological crisis? This is a great problem, but as we can see everywhere, it apparently cannot be faced directly (otherwise we would have already done). Because even though we know we are heading toward natural collapse and extinction, we continue along this path.[18] Instead, we have to ask ourselves more complex questions, given the new epoch of the Anthropocene, considering that perhaps (with the same technological power we possess today) even non-capitalist societies would have acted in the same way, leading us to ecological collapse (again, the example of megafauna extinction).[19]

So, the actual questions, which present themselves as *anthropological*, may be the following: what is the human culture or mindset that we have to change in order to shift from sustainability thinking to habitability thinking? Have we ever had, as humanity, examples of different ways of thinking that did not lead to consumption of natural environment and general extinction? Is there a way to think together humanity and natural flourishing, in terms of communion between intergenerational work and planetary life reproducibility? These questions concern both the capitalist way of living (its critics) and what lies beyond it, reflecting on a new way of living in the Anthropocene, which is a new epochal mode of thinking humanity and nature, not just another economic or social system in the recent history of civilization.

[18] On this point, see Fisher (2009, 2): «it is easier to imagine an end to the world than an end to capitalism».

[19] Again, consider the example of megafauna extinction discussed above (note 12), as well as the collapse of various human societies throughout history resulting from the overexploitation of natural resources. On this point, see also Diamond (2005).

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Capitalism Meets the Anthropocene: Dipesh Chakrabarty's and Nancy Fraser's Perspectives

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Abstract

In this paper, I compare Dipesh Chakrabarty's and Nancy Fraser's perspectives on the relationship between the climate crisis and the social-economic injustices of liberal-capitalist society. While the two authors appear to hold opposing positions, their approaches reveal a deeper conceptual convergence. Fraser explicitly subordinates the climate crisis to a critique of capitalism, which she regards as its structural cause. Chakrabarty, by contrast, while maintaining that social injustices – central to postcolonial critique – and the climate crisis must *de jure* be thought together, acknowledges *de facto* that the urgency of the planetary crisis seems to give it priority. Yet, upon closer examination, Chakrabarty's position converges with Fraser's in a crucial respect: by asserting the need to thematize the planet's habitability as a *common good* – one that must be consciously and collectively pursued – he implicitly challenges a foundational assumption of liberalism, particularly in its Hayekian form. For Friedrich von Hayek, the common good cannot be intentionally pursued; it arises as the unintended outcome of regulated individual interests within a spontaneous order. In contrast, Chakrabarty's emphasis on deliberate preservation of habitability rejects this logic, aligning his thought more closely with Fraser's critique of capitalism than their differing premises might suggest.

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Keywords: Anthropocene, Capitalism, Common Good, Habitability, Temporality

1. *Introduction*

In this essay I seek to contribute to the current debate on the notion of the Anthropocene, drawing on the work of two eminent authors, Dipesh Chakrabarty and Nancy Fraser, who, in addressing the Anthropocene-issue, have adopted theoretical approaches that are, in different ways, connected to the Marxist tradition. Thereby, I intend also to compare these paradigms in order to better understand their respective implications. Both scholars diagnose an *inadequacy*, while diverging in how they interpret it: in one case (Chakrabarty), Marxist and/or postcolonial critiques of capitalism are deemed inadequate to address the problems posed by the climate crisis; in the other (Fraser), an approach to ecological problems that does not take into account the broader issues of capitalist society is itself deemed inadequate to address the issue at its root. Accordingly, the argument I intend to develop will be structured into two parts. In the first section, I will present the two approaches, articulated respectively in *The Climate of History in a Planetary Age*[1] and *Cannibal Capitalism*.[2] In the second section, I will propose a reading of the relationship between the two approaches presented in the first section.

2. *Dipesh Chakrabarty's and Nancy Fraser's opposed stances on the interrelation between the ecological crisis and the critique of capitalism*

I will immediately begin to examine some aspects of Chakrabarty's approach. For reasons of space, I will be highly selective in my discussion of the relevant passages and contents, organizing the material *not* according to the traditional sequence of the four theses on the Anthropocene – which constitute the generative core of the entire book (first formulated in a seminal 2009 article[3] and reproduced

[1] Chakrabarty 2021.
[2] Fraser 2022.
[3] Chakrabarty, 2009.

as the opening chapter of *The Climate of History in a Planetary Age*) – but rather according to the line of argument I intend to pursue in this essay.

The first point to stress in Chakrabarty's approach is the central question with which he opens his book:

[H]ow should we conceive of our own times as we add to the postcolonial, postimperial, and global concerns of the last century issues such as anthropogenic climate change and the Anthropocene? The emergence of these latter issues surely does not mean that the issues that seemed important in the postcolonial world and in the context of globalization have gone away.[4]

In the lines that follow, Chakrabarty begins to list a number of issues at the heart of critiques of globalization (sovereignty, inequality, new forms of slavery and colonialism, to name only a few) that the advent of the climate question has by no means erased but instead coexists with. And it is precisely this *coexistence* that Chakrabarty wishes to foreground – a coexistence which turns out to be a *practical friction* that generates a *theoretical impasse*. My contention is that Chakrabarty maintains in this theoretical diagnosis an *ambiguous stance*. In the first instance, and explicitly, he upholds a *coexistence on equal footing* between – put simply – questions of survival and questions of justice, and thus between the natural sciences (which deal with the former) and the humanities (which deal with the latter). In the second instance, however, he implicitly suggests that, even if *de jure* questions of justice possess the same dignity as questions of survival, the latter nonetheless enjoy, *de facto*, a certain right of precedence.

This point is illustrated by the way Chakrabarty treats the issue of *temporal heterogeneity* – that is, the plurality of geological, biological, and historical times. Chakrabarty stresses that the impasse in which we find ourselves lies in our theoretical, and consequently practical, inability to confront a situation that involves a plurality of mutually heterogeneous temporalities.[5] A *first heterogeneity* is explicitly framed in terms of *temporal scales*: geological time is measured in millions of years, whereas historical time is measured in centuries – or even less, given the acceleration of history that we witness today. According to this first stance, the theoretical challenge consists in *connecting* heter-

[4] Chakrabarty, 2021, p. 10.
[5] Chakrabarty, 2021, pp. 50-51.

ogeny temporal categories: "We need to connect deep and recorded histories and put geological time and the biological time of evolution in conversation with the time of human history and experience".[6] However, in an earlier passage from the introduction, a *second heterogeneity* is implicitly introduced – this time spelled in terms of *urgency*. Chakrabarty states that questions of justice (as opposed to the urgency of climate crisis) belong to "an open and indefinite calendar".[7] To tell the truth, many people strongly disagree – and, indeed, take the opposite stance. The slogan with which the *Gilets Jaunes* flooded the streets of Paris in 2018 famously stated precisely the contrary: *"The elites are talking about the end of the world when we are talking about the end of the month"*.[8] It is important to note that in this case as well the issue was described in terms of a "conflict of temporalities",[9] although in that context urgency was located on the side of injustice. Likewise, a Sudanese mother whose child is starving *today* would experience the urgency of questions of injustice over those of sustainability (or habitability – more on this later) even more radically, by replacing "the end of the month" with "the end of the day." In short, questions of justice are often *also* questions of survival, and political crises often become humanitarian crises – without our being able to predict *if* or *when* they will do so. The fact that, "we don't know when humans will be successful in ushering in a fair and equitable world"[10] has nothing to do with assuming that "there is time a plenty for our historical questions of injustice to be settled".[11] Likewise, we do not know *if* or *when* the majority of nations will implement the necessary measures to effectively address the climate emergency. But this does not imply that such issues are *not urgent*, nor that they do not demand urgent action.

On the contrary, Chakrabarty seems to suggest that there is a fundamental theoretical mistake – not so much in the way we deal with humanitarian issues (for such issues, according to him, *do* belong to an open and indefinite calendar), but rather in implicitly applying this *theoretical assumption* ("there is indefinite time") to climate-related issues. In fact, as it can be easily argued, climate-related issues *do*

[6] Chakrabarty 2021, p. 7.
[7] Chakrabarty 2021, p. 10.
[8] Martin, Islar, 2021, p. 607.
[9] *Ibidem.*, p. 609 – see also Ledoux, 2018.
[10] Chakrabarty 2021, p. 10.
[11] Chakrabarty 2021.

not belong to an open and indefinite calendar and must therefore be approached with an altogether different *forma mentis*. In other words: temporal urgency establishes the *de facto* precedence of climate-related issues over humanitarian ones, in contrast to their *de jure* equivalence: if in the first instance a *coexistence* between heterogeneous temporalities has to be theoretically and practically envisaged, such coexistence risks ultimately resulting in a form of *subalternity*. And this subalternity results from what is implicitly assumed to be a *neutral*, *scientific* standpoint – a standpoint foreign to, say, the Sudanese mother, who *cannot* afford to believe that there is indefinite time to address questions of injustice: for her and her child, *justice cannot wait*.

I would like now to highlight another aspect of Chakrabarty's approach, relating to two pairs of concepts that he opposes in order to further articulate *heterogeneity* as the fundamental theoretical issue we are called to confront. Concerning the first pair of concepts – the *global* and the *planetary*, whereas "[t]he global is a humanocentric construction; the planet decenters the human",[12] two things should be stressed here. First, as rightly stressed by Matteo Pietropaoli,[13] the emergence of the *planetary* is to be considered as a paradigm shift, enacted by the *consequences* of actions unilaterally centered on the global. Secondly, the planetary does not emerge as something intrinsically valuable to be preserved, like a museum artefact in need of restoration. It emerges as that which must be safeguarded because it enables *our* survival. In this sense, it is not the *planet* that needs to be saved – for the Earth, as a planet *in itself*, would in all likelihood survive global warming without any difficulty. What must be preserved, rather, is its *habitability*. With this, a second pair of concepts comes into play – *sustainability/habitability* – which reiterates, in analogous terms, the global/planetary dualism, as "humans are not central to the problem of habitability, but habitability is central to human existence".[14] This last excerpt makes it clear once again that, in the last instance, questions of habitability *de facto* take precedence over those of globalization, which are centered more on issues of *human power* than on *life itself*.[15]

[12] Chakrabarty 2021 pp. 18-19.
[13] Pietropaoli 2025, p. 58.
[14] Chakrabarty, 2021, pp. 83-84.
[15] Chakrabarty 2021 p. 83.

If we now turn to analyze, at least in broad strokes, the way Nancy Fraser addresses the Anthropocene-question in *Cannibal Capitalism*, we encounter a much more linear theoretical framework. It can be schematized in the following four points: *firstly*, the notion of capitalism is understood by Nancy Fraser not merely as an *economic system* but as a *societal order*: "In this book […] 'capitalism' refers not to a type of economy but to a type of *society*: one that authorizes an officially designated economy to pile up monetized value for investors and owners, while devouring the non-economized wealth of everyone else".[16] *Secondly*, the growing discourse around capitalism reflects an increasing awareness that the various crises – financial, ecological, political, and social – that contemporary (even if not exclusively) Western democracies are experiencing are interconnected and stem from the same systemic ground. Any call for reform that does not address the deep systemic foundations of these crises is destined to fail.[17]

The *third point* to be highlighted here marks an important distance from orthodox Marxism, according to which the economic logic of capitalism is grounded on the notions of *exploitation* and *reification*, assuming its background conditions as given. On the contrary, Fraser emphasizes (also referring to Chapter 24 of the first volume of *Capital*) how capitalism displays a constant practice of *expropriation*. *Cannibalism*, rather than *reification*, thus emerges as the defining feature of capitalism as a form of life, as this last one "depends for its very existence on zones of non-commodification, which capital systematically cannibalizes."[18] The *fourth* and final point of this necessarily concise and selective analysis is that the "link between ecological crisis and capitalist society" has a "structural character".[19] While capitalism is not the only system to have caused environmental destruction, it is unique in that ecological crisis is *structurally embedded* within it.[20] Accordingly, the ecological crisis clearly exemplifies the cannibalistic character of capitalism. This concerns not only the issue of natural resources and planetary habitability, but also other aspects of

[16] Fraser 2022, p. xv.
[17] Fraser 2022, p. 1.
[18] Fraser 2022, p. 18.
[19] Fraser 2022, p. 80.
[20] Fraser 2022 pp. 82-84.

society that in theory lie outside the economic system, yet constitute its material preconditions – where "material" does not simply mean "thing-like." These include political institutions and systems of social reproduction. These are regarded as *ecosystems* that capitalism structurally tends to cannibalize, insofar as it does not grant them the status of *value* but merely of *resources*. It is due to this contradictory relationship with its own conditions of possibility that capitalism appears as "the ouroboros, it eats its own tail".[21]

If we are to offer a first, brief assessment, we can identify in the analyses of Chakrabarty and Fraser both a common element and a fundamental difference: on the one hand, both approaches emphasize the need to address the ecological crisis not as an isolated issue but in connection with a critique of capitalism, particularly concerning its impact on Global South. The main difference lies in how these relationships are framed. In one case, capitalism- and planet-related concerns are treated as *coexisting yet conflicting* issues, in which the planetary dimension gains a *de facto* right of precedence based on criteria of urgency. In the other, a direct *causal relationship* is established: capitalism is not merely one issue among many but the root cause of the ecological crisis – as well as numerous other crises.

In this contrast between approaches, Chakrabarty's emphasis on urgency seems to grant him the final word. Quoting (and implicitly endorsing) Ursula Heise's critique of Slavoj Žižek's *Living in the End Times*, Chakrabarty argues that global warming "will not stop tomorrow: even if a collective will to develop an alternative economic regime were to emerge in some of the planet's dominant nations, the transition to such a regime would almost certainly take decades (more likely, a century or more) – too late to affect the current climate crisis decisively."[22] In fact, the claim advanced in this article, to be argued in the next section, is that this is *not* Chakrabarty's final word – not because of what he *explicitly states*, but rather because of what he *implicitly assumes*.

[21] Fraser 2022, p. 84.
[22] Heise, 2016, p. 223, quoted in Chakrabarty, 2021, p. 66.

3. *The planet's habitability as a common good: The thematization of the ecological crisis and the operationality of the critique of capitalism in Chakrabarty's theoretical approach*

This section revolves around a main thesis, which may be formulated as follows: *In Chakrabarty's theoretical approach, the critique of capitalism unfolds on two levels:* a) A *thematic* level, as an issue that *might* no longer hold priority (the issue of social justice) faced with the urgency of climate crisis; b) an *operative* level, as a foundational assumption of his entire framework (the issue of the common good), which brings his theoretical approach, in an almost unexpected way, closer to that of Fraser, particularly on the following point: it is not a matter of asserting the *deontological relevance* of questions of social justice, even in front of the *factual urgency* of climate crisis. Rather, it is a matter of affirming the *theoretical impossibility* of addressing the climate crisis independently of a critique of the form of life (to put it simply, the capitalist one) within which it has emerged as an issue which cannot be effectively treated as a self-contained one (paradigmatically: as a mere scientific problem).

In the above formulated thesis, the term *operative* is intended in a technical-philosophical sense, notoriously formulated by Eugen Fink in his important essay *Operative Begriffe in Husserls Phänomenologie*.[23] In the reflections that follow, I will employ the term *operative* in a broader yet compatible sense with Fink's usage: as that which *enables* the formulation of an argument not by being explicitly thematized, but by implicitly assumed – operating, in this respect, as its theoretical presupposition. Accordingly, I intend to use the notion of *operative* as a hermeneutical tool for a comparative reading of both Chakrabarty's and Fraser's approaches, one that goes beyond the comparison drawn at the end of the first section – and which, in my view, proves more fruitful for understanding them both.

I begin by referring to a passage in which Chakrabarty highlights how the anxiety provoked among specialists (and which should equally be shared by ordinary people) by the risk of a climatic apocalypse must be distinguished from the fear once generated by the threat of nuclear catastrophe:

[23] Fink 1981, p. 59.

The anxiety global warming gives rise to is reminiscent of the days when many feared a global nuclear war. But there is a very important difference. A nuclear war would have been a conscious decision on the part of the powers that be. Climate change has largely been a combination of intended and *unintended* consequence of a cascade of human decisions and actions.[24]

My italicization of the term "unintended" aims to underscore a decisive aspect of how Chakrabarty understands the peculiarity of the climate crisis and of the very notion of the Anthropocene. The question of the Anthropocene arises from the recognition that humanity's impact on the Earth system could become irreversibly devastating for its own survival *independently of any specific decisions* concerning specific circumstances, such as those related to a nuclear war scenario. There is no need for war; it is enough that we keep going to work every day and take our holidays two or three times a year to provoke a climatic catastrophe. The risk of human extinction, in Fraser's terms, is *inscribed, within our form of life* – a form we have carried forward for centuries as individuals and which now seriously endangers our survival.

All of this comes into radical conflict with one of the assumptions that have underpinned – albeit with significant variations (sometimes decisive ones, but this is a topic that cannot be properly addressed here) – the entire theory of the economic form of capitalism, from Adam Smith's notion of the *invisible hand*, through the important figure of Mandeville (to whom von Hayek devoted an important essay), up to its crystallization in Friedrich von Hayek's notion of *catallaxy*, or *spontaneous order*.[25] Such a notion refers to a form of cooperation in which the so-called common good is neither planned nor deliberately pursued, but rather emerges as an *unintended consequence* of the actions of individuals pursuing their own interests (whether egoistic or altruistic is another question), within an order governed by rules but not by a preordained collective goal. The common good thus emerges *ex post*, as an unplanned outcome of diverse individual actions.[26] The point to be made here, then, is that Chakrabarty's approach rests upon a set of considerations implicitly grounded in this very notion of *spontaneous order* – and therefore, *de facto* and *de jure*, in the idea of the capitalist economy itself, at least in the form in which we have

[24] Chakrabathy, 2021, p. 45, my italics.
[25] Hayek 2021 [1982], pp. 310, 312-313.
[26] Hayek 2021 p. 71.

historically known it. The difference, however, is that what is now emerging is not a *common good* but a *common evil*: a climatic apocalypse that threatens the very existence of the human species.

This difference is significant for the following reason: in order to avoid the *common evil* that has emerged from our everyday activities, it becomes necessary, so to speak, to *thematize* the *common good* – specifically, the habitability of planet Earth. At least, this is what follows from Chakrabarty's approach. *The preservation of the planet's habitability is emerging as the crystallization of the notion of the common good*, which must (and has already begun to) be consciously established as a collective goal to be pursued, rather than left to the unintended consequences of actions driven by individual interests.

This deliberate establishment of a common good to be intentionally pursued is incompatible with the notion of *catallaxy*, and therefore with the kind of order that, according to Hayek, characterizes liberal and capitalist societies. In Hayek's terms, "[t]he decisive step which made such peaceful collaboration possible in the absence of concrete common purposes was the adoption of barter or exchange".[27] The point to be made here is the following: while the process of exchange is assigned the function of harmonizing individual interests,[28] the notion of *habitability* – as a *common good in both the collective (for the population) and distributive (for each individual) sense* – must, by contrast, be understood as a *non-exchangeable* good. There is nothing that can be bought in place of the planet's habitability: the mechanism of exchange simply *does not work* here. This applies equally at the generational level: we cannot think of *buying* habitability from future generations, selling them in return the material prosperity derived from the very activities that destroy that habitability. It simply does not work – *not only for practical reasons, but for radically theoretical ones.*

In this sense, the critique of capitalism has an *operative relevance* within Chakrabarty's approach: if we conceive capitalism as a societal order rather than merely an economic system, we must also acknowledge that it inherently includes an inability to think in terms of a "common goal": "A Great Society […] is in fact irreconcilable with 'solidarity' in the true sense of unitedness in the pursuit of known common goals".[29] Thus, addressing the problem of the climate crisis *presupposes* a

[27] Hayek 2021, p. 310.
[28] *Ibidem.*, pp. 183-184.
[29] Hayek 2021, p. 313.

radical critique of capitalism as the "societal order" of Western modernity – not because it is a source of injustice, but because it is a form of life that prevents the thematization, which is *required* in Chakrabarty's approach, of the common good, namely the planet's habitability.

We are therefore now in a position to draw some, neither definitive nor comprehensive conclusions, which, as I hope, show that the approaches of Nancy Fraser and Dipesh Chakrabarty – though apparently distant from each other – actually both assume that the ecological question cannot be addressed without a simultaneous critique of the capitalist system. In Fraser's approach, the critique of capitalism has a *double thematic relevance*: both at a symptomatic level, through its various manifestations in contemporary society (social inequalities, gender inequalities, commodification of the human body, climate crisis), and at a pathological level, as the common root of all these symptoms.[30] In Chakrabarty's approach, the *relevance* of the critique of capitalism unfolds *along two dimensions, a thematic and an operative one.* On the one hand, its thematic dimension is framed within his critique of globalization – rooted in his postcolonial theoretical background – as a source of injustice, and is therefore implicitly treated as a non-priority issue compared to the planetary one. On the other hand, its operative dimension lies in the acknowledgment of the planet's habitability as a common goal to be deliberately pursued – an acknowledgment that proves incompatible with the notions of spontaneous order and catallaxy, both of which are integral to the theoretical framework of the capitalist system.

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Beyond the end of Nature: Ecology, Marxism, and the non-identity of Nature

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Abstract

Marxist theory has been historically criticized by ecologist scholars for its "productivism" and Prometheanism, meaning the belief that the post-capitalist society would have been a growth-oriented one and that it would have represented the "end of Nature" after the end of history, the ultimate moment of emancipation of humans from nature, the leap into the realm of freedom. Contra this narrative, which depicted Marxism as radically incompatible with ecological thought, many scholars emphasized how Marx's theory of metabolism could be essential in understanding the Ecological Crisis. My claim will be that Marxism is obsolete (if not toxic) for the current ecological epoch of the Anthropocene if it is not able to part company from these two allegations. Focusing on the concept of "non-identity" of nature understood as its structural non-coincidence with the human subject, who never has control, practical and theoretical of it, I will lead the discussion toward a renewed concept of nature, a hybrid concept, which is analytically, but not ontologically, separable from society (or "the human"). Through the concepts of "hybrid nature" and "non-identity" we can find a dimension that accounts both for the steady mediation and dialectical interconnection between nature and society, and the recognition of some "absolute limits" of nature, such as planetary boundaries, constructing an ecological Marxism adapted for the Anthropocene, beyond the productivist myth and Promethean views of history.

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Keywords: Marxism, ecology, non-identity, productivism, Prometheus, hybrid nature

I want to start my speech with a question: is Marxism as it is (I mean classical Marxism, Marx's Marxism) still an apt theory for our current epoch of ecological crisis? And if it is not, if it is an obsolete theory *vis a vis* the Anthropocene, is it possible to "save" something of the ghost of Karl Marx?

The idea I want to present you today is that Marxism is an obsolete theory for the Anthropocene if we are not able to parcel out of it two things, two allegations we might say (which are Productivism and Prometheanism) and recognize the "non-identity of nature" therefore abandoning an ontological monism (together with a dichotomic Cartesian dualism) in favor of an "hybrid pluralistic" view of nature and society.

Before starting I want to clarify what I mean with "Anthropocene", since it is an "essentially contested concept" (as Gallie called them). There are many controversies around the term "Anthropocene" both philosophical and scientific, I do not intend to address them in this presentation. I will leave the red-hot battlefield of geology to geologists (who are still fighting to determine the stratigraphic legitimacy of the Anthropocene as a new geological epoch), and I'll use "Anthropocene" as a fully legitimized concept to indicate a new epoch (or event?) marked by the irreparable and totalizing ecological footprint of human beings on the planetary system which is manifested through its multiple dimensions: global warming, oceans' acidification, pollution, the sixth mass extinction in the history of our planet, the collapse of ecosystems and biodiversity, biotic mixing and we may identify many more. I know many people do not agree with the use of the term "Anthropocene" for different reasons and prefer other terms such as "Capitalocene"[1], I think that "Anthropocene" is a better candidate (I tend to agree here with Chakrabarty[2]) since it is both

[1] Cfr. J.W. Moore, *Anthropocene or Capitalocene? Nature, History and the Crisis of Capitalism,* PM Press, Oakland 2016; A. Malm and A. Hornborg, "The geology of mankind? A critique of the Anthropocene narrative." *The Anthropocene review* 1.1 (2014), pp. 62-69.

[2] Cfr. D. Chakrabarty, "The politics of climate change is more than the politics of capitalism", *Theory, culture & society*, 34(2-3) (2017), pp. 25-37.

theoretically more robust than the other options, and stronger from a communicative point of view. I think that it can be understood as jumble of histories ("multiple, debatable and polemical narratives" as Bonneuil and Fressoz wrote in their brilliant book[3]) which shed light on all the different contingent paths leading to the ecological crisis. The Capitalocene, meaning the history of how the capitalist mode of production accelerated and exploited this crisis is one of the multiple stories within the Anthropocene.

So, coming back: Is Marxism obsolete in the Anthropocene? Or is it even dangerous from the ecological point of view? The answer would be yes if we are not able hive off two ghosts that hunt Western Marxism since the XX century: productivism and Prometheanism. With Prometheanism we mean: the glorification of the separation (or the rise) of humanity over nature, its conquest as a destiny of humankind and the praising of the free manipulation of the natural object and resources as something separated from and in the hands of humanity. To quote Aeschylus' original verses:

> I searched out and stole / the source of fire concealed in fennel stalks, / and that taught men to use all the arts / and gave them ways to make amazing things / […]
> you are looking at the one who offered men / the gift of fire. I am Prometheus[4]

Productivism is the political and economic orientation resulting from this stance.

Since the second half of the XX century there has been a long-standing antagonism between "Red" and "Green"[5]. Marxists often opposed environmentalism (as inherently anti-working class and "only functioning as an ideology of the upper middle class", meaning an instrument of hegemony, a way of deflecting the struggle of the working class toward something else – the protection of the planet – and also to criminalize individual habits). On the other hand, the not

[3] C. Bonneuil and J.-B. Fressoz, *The shock of the Anthropocene: The earth, history and us*, Verso Books 2016, p. 182.

[4] Aeschylus, *Prometheus Bound*, vv. 108-111, 613-614, English translation by Ian Johnston.

[5] Cfr. K. Saito, *Marx in the Anthropocene. Towards the idea of Degrowth Communism*, Cambridge 2022, p. 13.

wonderful ecological example of the USSR (we can quote the radioactive contamination of the Lake Karachay or the destruction of the Aral Sea) convinced the environmental movements in the West which was forming in the 70s that real socialism was not compatible with a genuine ecological concern for the environment.

The productivist ghost is present in many Marx's writings too: in *The Communist Manifesto* and *The Critique of Political Economy,* there is certainly an idea of the post-capitalist society as a productivist, growth-oriented one, in an outburst, as many scholars such as Saito pointed out, of "revolutionary optimism"[6]. The words of the 1859 preface are a common focal point: "No social order is ever destroyed before all the productive forces for which it is sufficient have been developed, and new superior relations of production never replace older ones before the material conditions for their existence have matured within the framework of the old society"[7].

This view of productivist Marxism crossed the whole history of western Marxism, survived the collapse of the Soviet Union and is still popular today. Axel Honneth for example criticized Marx's "technological determinism that supposes a linear progress of productive forces for the sake of domination of nature"[8]. Others, such as Fredric Jameson have seen this Promethean impulse of Marxism as a positive thing, "a passionate commitment to a streamlined technological future"[9].

The idea of Prometheanism, so of a nature clearly separated and controlled in every of its aspects by the human hands is strongly linked to the idea of the "End of Nature", a phrase popularized in 1989 by Bill McKibben[10]. To conceptualize nature as an independent, separate force which defines a clearly separated domain from the human one, in the epoch of the Anthropocene, is doomed to an irremediable conclusion: "We have killed off nature. That world entirely independent of us which was here before we arrived and which encircled and supported human society […] is stamped indelibly with our crude imprint, our X"[11]. If, as environmentalists, we see the End of Nature

[6] Cfr. *ibidem.*

[7] K. Marx, "Preface to a Contribution to the Critique of Political Economy." *The Marx-Engels Reader* 2 (1859): 3-6.

[8] A. Hoenneth, *The Idea of Socialism: Towards a Renewal*, Polity Press, Cambridge 2017, p. 45.

[9] F. Jameson, "Dresden's Clocks", *New Left Review* 71 (2011), p. 150.

[10] Cfr. B. McKibben, *The End of Nature,* New York 1989.

[11] *Ivi* p. 82.

as something negative, then the Anthropocene is a hopeless sorrowful condition which lead us in a post-natural world, in which there is no element left that does not bear the mark of human interference. It is, sadly, a nihilistic and immmobilistic "nothing to be done" condition. The other side of the "sorrowful Anthropocene" coin is Eco-modernism[12]. Eco-modernists view the separation between humans and nature and the absolute control of the first over the latter as a positive thing, a great conquest! Prometheus unbound, through culture and technology, defeated the blind and violent forces of nature and brought us in the realm of real freedom. A Marxist Prometheanism would reach, from the ecological point of view, the same conclusions of techno-enthusiastic accelerationists thinkers. So, something like this: "what really matters to accelerate a sustainable future is being able to scale up production as quickly as possible". Would you guess who is the person who said that? They also said this "one day when I was young, my parents warned me against playing with fire. So I took a box of matches behind a tree and started lighting them". A real young Prometheus. It was Elon Musk, who also said this: "Well, yes, I am pro-human. I fucking like humanity, dude"[13], just to clarify his stance in the battle between the blind forces of nature and humanity.

So, Nature has been killed, the hands of the Prometheus unbound, for the better of the worse, brought it to its end. Defending Marx from this murder has been done through the re-discovery of Marx's ecological critique of capitalism in his late works and journals (so the last volumes of The Capital and his personal journals and letters), started by Mezaros, and carried on by Burkett, Bellamy Forster, Löwy, Saito and many people at this very conference! My core claim is that to efficiently dissipate the ghost of Prometheanism, eco-Marxism needs to reject the core theoretical division between nature and humans (the so-called Cartesian ontological dualism), as well as the ontological monism that claims that, in the Anthropocene, the human pole of the dichotomy has absorbed and killed off nature for good. Or the idea of an abstract totalizing nature, to defend in its uncontaminatedness.

[12] Cfr. J. Asafu-Adjaye, et al., *An Ecomodernist Manifesto*, April 2015, published online at ecomodernism.com.

[13] Musk's quotes are from M. Kruse "The 199 Most Elon Musk Things Elon Musk Has Ever Said", Politico, 24/01/2025 https://www.politico.com/news/magazine/2025/01/24/199-elon-musk-quotes-00199008.

Nature has not ended, nor it never really existed (as social constructivists think)[14]. Nature is not a dichotomic opposite of humanity. The return of Nature, which in the Anthropocene is manifested through uncontrollable extreme climatic events, unpredictable changes of ecosystems, negative and positive feedback loops, enforces us to envision a different nature. A nature which is

1. Hybrid: as Chakrabarty brilliantly wrote a few years ago, the Anthropocene is moment in which we are forced to see the convergence of human and non-human (the planetary) histories[15]. The interaction (the dialectic) between nature and society is the productive force of what we call nature: irreproducible combinations of human elements and history (sometimes even harmful and environmentally destructive as oil plants) and non-human elements such as evolutionary adaptations of plants and animals, migration patterns and contingent events. This hybrid nature is what Timothy Morton calls "symbiotic real"[16] a space in which to exist means to co-exist, in which everything is in a web of relations which it cannot escape. That "paradoxical plurality of unique beings", to quote the beautiful expression of Hannah Arendt[17].

2. This hybridity must not be interpreted, as some critics do, such as, again, Saito, as a reprisal of an ontological monism. To reject the Cartesian dualism is not simply to absorb one of the two poles into the other one. What the idea of hybrid nature opens is something different: the inhabitants of what Latour called "the middle kingdom"[18]: the immense space of existence of quasi-objects, entities entangled in collectives which merges characteristics of the society and nature poles altogether. Different ways of "being nature" emerge, and we find ourselves in an ontological condition which can be called, and I use the brilliant words of Federico Leoni "ontology of many plans"[19]. An ecological pluralism.

[14] Cfr. S. Vogel, *Thinking like a Mall. Environmental Philosophy After The End of The Nature*, MIT Press, Cambridge 2015.

[15] Cfr. D. Chakrabarty, "The Climate of History: Four Theses", *Critical Inquiry,* 35, (2009), pp. 197-222.

[16] Cfr. T. Morton, *Humankind: Solidarity with non-human people*, Verso Books 2017.

[17] H. Arendt, *Human Condition,* University of Chicago Press, Chicago 1958, p. 96.

[18] Cfr. B. Latour, *We Have Never Been Modern,* Harvard 1993.

[19] Cfr. F. Leoni, "An Ecology Without Nature? Merleau-Ponty, Simondon, Latour", *Chiasmi International*, 24 (2022).

This approach, applied to a Marxist dialectical conception of reality, is able to recognize the "non-identity of nature", a concept belonging to the tradition of critical theory and meaning its always being more than human, exceeding the human realm, containing a non-social dimension. Non-identity means, in Adorno's *Negative Dialectic*[20], structural non-coincidence with the human subject who never has control (practical or theoretical) over nature. The Anthropocene put at the forefront our societal relationships with nature which are always a steady mediation and interconnection between natural and social history, human and non-human existences and bodies which are not separable through an ontological dualism, nor completely superimposable: they are dialectical relationships, therefore historical and critical[21].

An ecological Marxism for the Anthropocene is possible, and it needs to recognize the non-identity of nature, its hybridity, and the contingent dialectical social relationships between the human and non-human world. In this way it could be able to leave in the XX century the ghost of Prometheus, fighting against the ecological crisis with all the means possible.

Venice, 11th March 2025

[20] Cfr. T. Adorno, *Negative Dialectics,* London 1966.

[21] Cfr. C. Cassegård, "Eco-Marxism and the critical theory of nature: two perspectives on ecology and dialectics", *Distikon: Journal of Social Theory,* 2017; C. Görg, "Societal Relationships with Nature: a Dialectical Approach to Environmental Politics", *Critical Ecologies: The Frankfurt School and Contemporary Environmental Crises*, Toronto 2011.

On Matter and Society: Hornborg, Malm and Marx's Legacy

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Abstract

This paper analyses the converging theoretical proposals of Alf Hornborg and Andreas Malm regarding the social impacts of abiotic matter. It demonstrates how Hornborg and Malm, through distinct research pathways, both construct their works around the key issue of how non-living objects shape social relations and historical trajectories. They argue that the societal impacts of abiotic entities are not a result of intrinsic agency but rather mediated consequences of living beings' intentional actions. Drawing from Marx's writings on agency and fetishism, their work provides crucial tools for locating the origins of ecological crises in human history and social relations.

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Keywords: human-nonhuman relations, agency, new materialism, ecology, Marxism

1. *Introduction*

It is now widely accepted in the social sciences that traditional Western dichotomies, such as nature/society or human/non-human, are inadequate for addressing the complexity of the current global ecolo-

gical crisis. The proliferation of Anthropocene discourses highlights a pervasive need for new paradigms to interpret socio-ecological phenomena relationally, moving beyond a clear separation between humans and non-humans.

Within these discourses, a pivotal role is occupied by the two Swedish scholars Alf Hornborg and Andreas Malm. Among their many research subjects is the critique of the concept of the Anthropocene itself, as well as numerous reflections on ontological issues, with a particular focus on the conceptualization of the relationship between humans and non-humans.

The purpose of this paper is to provide an analysis of this aspect of Hornborg and Malm's work, highlighting how both place the question of the conceptualization of the social impacts of non-living matter at the center of their work, ultimately converging, although through different pathways, in the elaboration of a common theoretical proposal.

The initial section of the paper provides a general overview of the two authors' primary research subjects, with the objective of demonstrating that by abstracting from particular individual objects of study and adopting a wider perspective focused on the theoretical framework within which their reflections develop, it is feasible to contend that the theme of the social impacts of abiotic matter constitutes a pivotal node of their research.

The subsequent section will present a reconstruction of the main aspects of Hornborg and Malm's critique of the neo-materialist proposal to interpret the consequences of non-living entities as manifestations of the agency of abiotic matter. This reconstruction aims to demonstrate how the two Swedish scholars independently arrive at their own original proposal, which posits that the consequences that non-living objects have on their environment are the result of the mediation of the agency of living beings, and, in the case of impacts on society, of human actions.

In the last section, a brief overview of the role of Marx's thought as a source of Hornborg and Malm's own intellectual work is presented. The reconstruction of the intellectual debt that links the two to Marx in some key points of their elaborations is intended to demonstrate how their conceptualization of the social impacts of abiotic matter is ultimately aimed at providing the necessary conceptual tools for identifying the origin of ecological crises in human history and social relations.

2. *From Ecologically Unequal Exchange to the Capitalocene: An Overview of Hornborg and Malm's Work*

To demonstrate how the ontological question occupies a pivotal role in both the works of Hornborg and Malm it is necessary to look at their research from a perspective which goes beyond the beyond the confines of particular research topics to contemplate the overarching theoretical framework within which they are developed. Nonetheless, this can only be done by first providing a general summary of the most relevant aspects of the two scholars' research, obviously without any claim to be exhaustive in describing the very rich and complex bodies of work they have developed.

Hornborg's work could be described as developing around three main topics. First, the integration of the concept of "ecologically unequal exchange" into world-systems theory with the aim to demonstrate how the perceived fairness and reciprocity of international exchange are actually elements of a mystifying worldview hiding the existence of exploitive net transfers of energy and resources going from the periphery of the world-system towards its center[1].

Second, a critique of the idea that machines and technology are the neutral result of human ingenuity arguing, instead, that technological development is, at one time, both a direct consequence of ecologically unequal exchange and a condition for the dislocation of environmental and workloads from the center towards the periphery[2].

Third, the analysis of general-purpose money acting as the true engine of the ecological crisis by allowing the reduction of all of nature to abstract and universal monetary value, thus hiding the uneven material relations and the biophysics flows upon which the global economy and global inequalities are based[3].

Regarding Malm, the following two topics are of the greatest relevance. First, the historical analysis of the roots of the climate crisis developed in his *Fossil Capital*. In that work, the conventional narratives about the process of conversion to fossil fuel production in nineteenth-century Britain are deconstructed, demonstrating that the conversion was not motivated by the search for cheaper or more efficient energy

[1] See Hornborg, 1998.
[2] See Id., 2016.
[3] See Id. 2019.

sources. Rather, it was driven by the greater control over the workforce that the use of fossil fuels guaranteed to factory owners[4].

Second, the critique of the notion of the "Anthropocene", developed in part in collaboration with Hornborg himself. In this critique, Malm argues that attributing the origin of the climate crisis to the entire human species is not only historically inaccurate but also a misleading and depoliticizing act of mystification. In order to challenge this outcome, he proposes the use of the term "Capitalocene" as a means of indicating that it was a specific mode of production, namely capitalism, and not an abstract humanity, that generated modern society's structural reliance on fossil fuels[5].

Given this background, it is now possible to examine these works from a standpoint that seeks to abstract the ontological framework within which they are developed from the individual research topics. The objective of this operation is, as anticipated, to emphasize the existence of a shared intellectual imperative in both scholars to investigate how non-living objects, which constitute part of the human environment, can shape social relations and exerting influence on the historical progression of human societies in a particular direction.

Adopting this perspective, Hornborg's research could be reformulated as an attempt to explain how abiotic entities such as technology or money regulate the net transfers of resources and energy between the center and periphery of the world and are, consequently, at the root of both the ecological crisis and global inequalities. In a similar manner, Malm's work may be interpreted as a historical reconstruction, elucidating how the specific category of non-living entities constituted by fossil fuels, by virtue of their ontological space-time profile, made the emergence of fossil capitalism and the social relations on which it is predicated possible.

Nonetheless, the mere reformulation of the research topics alone does not provide sufficient clarity regarding the way in which the two authors develop their own theory of the societal impacts of abiotic matter. To address this subject, it is imperative to move, with this reframing of the two scholars' works in mind, to a thorough examination of the criticisms that they direct at a common theoretical adversary: the philosophy of "new materialism".

[4] See Malm 2016.
[5] See Malm, Hornborg 2014.

3. *The Critique of New Materialism: Agency vs. Consequences*

The term "new materialism" is typically employed to denote a collection of theories that aspire to transcend the notion of «matter as passive stuff, as raw, brute, or inert»[6]. They argue for acknowledging the capacity of objects «not only to impede or block the will and designs of humans but also to act as quasi agents or forces with trajectories, propensities, or tendencies of their own»[7].

The objective of these theories is typically to emphasize the "material agency" of non-human entities from which the impacts they exert on human society are derived. The crux of the debate between the two Swedish scholars and new materialism lies in the interpretation of the societal impacts of non-living entities. In the context of analyzing socio-ecological phenomena, the question of whether the social impacts of non-living objects are the direct result of some kind of non-human agency is a complex one. If this is the case, on what grounds can it be argued that such entities possess the capacity for agency? By analyzing the limits of the new materialist answer to this question, Hornborg and Malm argue that a more appropriate interpretation of these effects would be as indirect consequences of human actions and history.

Hornborg states that he shares with the posthumanist trend to which new materialism belongs to the desire to find new paradigms for interpreting socio-ecological phenomena that go beyond so-called "Cartesian dualism". That is to say, he also rejects the idea of a metaphysical separation between living and non-living beings. However, Hornborg contends that this aspiration must not result in the total disregard of the conceptual distinction between these two kinds of entities. He argues that «to acknowledge that nature and society are inextricably intertwined all around us [...] does not give us reason to abandon an analytical distinction»[8] between aspects of reality deriving from the organization of human society and those deriving from the physical principles intrinsic to the prehuman universe.

Referring directly to Hornborg, Malm also claims that «the truly vital theoretical task is to maintain the analytical distinction so as to tease out how the properties of society intermingle with those of

[6] Bennet 2010, p. vii.
[7] Bennet 2010 p. viii.
[8] Hornborg 2016, p. 30.

nature»[9]. However, what is the property that would allow the distinction between the ways in which biotic and abiotic entities are able to influence their environment is yet to be determined. According to the two Swedish authors, the answer to this question lies precisely in the capacity for agency inherent in living beings.

Malm's argument posits that the neo-materialist proposition of attributing agency to non-living matter confronts at least two theoretical shortcomings that would compromise its validity, particularly in the context of analyzing socio-ecological phenomena. The initial challenge pertains to the conceptualization of agency itself.

Following Malm's argument, one can see that «in everyday language and folk psychology, acting is associated with wanting»[10]. This is predicated on the premise that what differentiates acting from mere behavior, understood as events unfolding without any discernible agency, is the prevailing perception of former as being inherently intentional in nature. To elaborate, the intentionality of an action is not merely conceived as a directedness towards an object, but rather as a future-oriented intentionality directed towards the accomplishment of certain goals or the realization of a particular state of affairs that is not yet extant.

Referring explicitly to human beings, as the focus of his discussion is primarily the interaction between human society and its abiotic environment, but expressing an idea that could easily be extended to all living beings, Malm claims that this specific kind of intentionality is a prerogative for acting and constitutes «the trademark of our interaction with the rest of nature»[11], thus defining agency as a property unique to living beings.

The new materialists, instead, typically formulate their propositions on the basis of a definition of agency such as the one proposed by Bruno Latour, a founding intellectual figure for the new materialist movement, according to whom agency is have the capacity to make some difference to a state of affairs[12]. However, the issue with this definition, as posited by the Swedish scholar, is its excessive breadth and generalization. This would permit the classification of any entity as an

[9] Malm 2018, p. 61.
[10] Malm 2018 p. 84.
[11] Malm 2018 p. 86.
[12] See Latour, 2005, p. 71.

agent, given that the mere existence of an entity is already a change in a particular state of affairs if compared to when the entity was not there. According to Malm, this approach effectively strips the concept of agency of its significance[13].

The second theoretical challenge encountered by new materialism pertains to the notion of "unintended consequences". This notion is of particular relevance to Malm as it constitutes one of the theoretical cornerstones upon which the contemporary historical and scientific understanding of the climate crisis as an anthropogenic phenomenon is based. However, according to Malm, linked to new materialism is the implicit postulate that «intentional human agency terminates at the point where unintended consequences materialise»[14]. Consequently, when it comes to identifying the agency responsible for the unintended consequences of human actions, «some other agency takes over, namely that of the entity which causes those consequences»[15], thus presenting these consequences as the result of an agency other than that of humans and emptying the very notion of "unintended consequences" of any meaning.

In opposition to this conclusion, the Swedish scholar contends that the reason why the consequences of human actions exceed the initial intentions of the agent is not due to the presence of «reverberations or additional causes that are endowed with the property of agency»[16] but rather simply because humans are material beings situated in a fully material world. Only the elaboration of a theory based on this fundamental aspect, Malm claims, would enable the preservation of the notion of "unintended consequences" which «assumes the centrality of an agent who acts with a specific intention, thereby initiating a sequence of events that are her responsibility, despite not being aligned with her initial objective»[17]. In such theory, the unintended consequences attributable to non-human entities should be regarded as integral aspects of the original action as stretched out over time.

To provide a concrete illustration, Malm asserts that «global warming is an integral aspect of consuming fossil fuels, not another action performed by others»[18]. In other words, the core element of the

[13] See Malm 2018, p. 89.
[14] See Malm 2018 p. 93.
[15] See Malm 2018.
[16] See Malm 2018 p. 95.
[17] See Malm 2018 p. 94.
[18] See Malm 2018 p. 96.

worldview that Malm argues for is that the social impacts of abiotic entities do not stem from the agency of inanimate matter. Instead, these impacts are the result of a mediation, through non-living entities, of the agency of living beings and the related consequences across space and time.

In a manner akin to Malm, Hornborg's position is also that of the delineation between living and non-living entities being based on the notion of intentional agency. Agency, he claims, is driven by purpose. All living organisms have purposes inscribed in their composition, whether «the amoeba's absorption of nutrients from its surroundings, the tree's extension of branches into the sunlight and roots into the soil, or a human preparing and ingesting a meal»[19]. These examples illustrate how the actions of living beings, albeit in different forms depending on the species in question, are characterized by intentionality that presupposes a certain capacity for consciousness and communication. Hornborg further elaborates by positing that living organism are all equipped to register specific aspects of their environments and to respond to them accordingly. Therefore, he argues, the new materialist proposal cannot be accepted as it does not adequately consider the distinction between living beings as semiotic entities and non-living things, which are incapable of communication and purposive action. Nevertheless, Hornborg's position does not entail a dismissal of the significance of examining the social ramifications of abiotic entities within the purview of human ecology. Conversely, Hornborg posits that «most of the literature on global environmental change over the past few centuries has been content with describing the observed ecological transformations, without providing any explicit theoretical framework with which to understand them»[20].

In order to interpret the social impacts of non-living objects, a new theoretical framework must be established. This framework should be based on the observation that these objects, rather than possessing agency, «simply have consequences»[21]. The theoretical challenge that must be addressed is therefore to provide conceptual tools capable of accounting for the complexity of the ways in which non-living objects can influence their surroundings without ascribing them the capacity

[19] Hornborg 2019, p. 180.
[20] Hornborg 2019 p. 179.
[21] Hornborg 2019 p. 189.

for agency. In this regard, although Hornborg does not provide an illustration of a rigorous theoretical system, it can be argued that his work also provides a conceptual basis from which to develop further ideas.

As with Malm, this proposal can be summarized as focusing on the use of the concept of mediation to explain the social effects of abiotic matter as the result of a mediation of the agency of living beings. Hornborg writes that non-living objects do not possess the capacity for independent action, yet they are able to exert influence on their environment, resulting in consequences for that environment, in a minimum of four distinct way as follows: firstly, as constraints, when they constitute an obstacle to the agency of living beings; secondly, as catalysts, when they direct living beings to act in a certain way; thirdly, as proxies, when living beings delegate certain functions to objects; and fourthly, as fetishes, when objects are perceived as having an autonomous agency that they do not possess. Hornborg's position is that, in all of the aforementioned cases, objects may constrain, prompt or mediate the agency of living organisms. However, it is imperative to acknowledge the fundamental distinction between purposive agency and mere consequences, a distinction that cannot be disregarded under any circumstances[22].

4. *Conclusion: Marx's Enduring Legacy*

Having delineated the core aspects of the two authors' proposal and the theoretical junctures through which it develops, the question of the sources of their thinking must now be addressed. Indeed, they do not present their ideas as entirely innovative within the social sciences; rather, they claim to build their ideas on the basis of well-established notions and theories. Among these, Marx's work is arguably one of the most influential. In this section, only a concise overview of the key points that demonstrate how Hornborg and Malm identify a direct source for their proposal in Marx's thought is provided, postponing a more in-depth analysis to future discussions.

In the case of Malm, this is particularly evident in his proposal to utilize the category of agency as a means of distinguishing between the various ways in which different types of entities can influence the human environment. In this instance, Malm argues that this position

[22] See *Ibidem.*, p. 182.

had already been established in Marx's oeuvre. In particular, he explicitly quotes the well-known passage on spiders and bees in Volume I of *Capital*:

> A spider conducts operations which resemble those of the weaver, and a bee would put many a human architect to shame by the construction of its honeycomb cells. But what distinguishes the worst architect from the best of bees is that the architect builds the cell in his mind before he constructs it in wax. At the end of every labour process, a result emerges which had already been conceived by the worker at the beginning, hence already existed ideally[23].

Although Marx does not explicitly refer to inanimate matter in this particular passage, limiting his discussion to the difference between animals and humans, Malm contends that it contains the idea that the degree of agency constitutes the discriminating factor between the ways in which different types of entities can influence their environment. In this sense, Malm's own proposal can be interpreted as an attempt to take up and extend the conclusions already reached by Marx, applying them, in the ways described above, to the debate on the social impacts of non-living entities.

In contrast, Hornborg's work primarily draws upon Marx's concept of "fetishism". For the Swedish scholar, this concept is a fundamental tool «to see how human relations to objects are ultimately about their relations to other humans»[24]. New materialism, for instance, qualifies as a fetishistic worldview because it perceives the societal effects of objects like money and technology as «determined by the intrinsic properties of the artifacts, rather than by the regulations and features bestowed upon them by human agents»[25], and therefore as an expression of social relations. Thus, Hornborg claims his idea of "fetishism" as the illusory attribution of agency to inanimate things to be rooted directly in another well-known passage from Volume 1 of *Capital* where Marx wrote:

> the commodity form, and the value-relation of the products of labour within which it appears, have absolutely no connection with the physical nature of the commodity. It is nothing but the defini-

[23] Marx, 1990, p. 284.
[24] Hornborg 2013, p.12.
[25] Hornborg 2019, p. 189.

> te social relation between men themselves which assumes here, for them, the fantastic form of a relation between things. [...] I call this the fetishism which attaches itself to the products of labour as soon as they are produced as commodities, and is therefore inseparable from the production of commodities[26].

However, Hornborg's work does not merely consist of a direct repetition of Marx's ideas; rather, it aims to expand upon his reflections on fetishism in a manner that surpasses the scope of the latter's work. According to Hornborg, Marx remains a victim of what the Swedish scholar has termed "machine fetishism"[27]. Machine fetishism is the idea of technology being independent of social relations, masking its reliance on unequal exchange, and Marx, according to Hornborg, would fall victim to it when claiming that capitalist technology could simply be repurposed for socialism.

It is not the intention of this study to engage in the debate surrounding the accuracy of these interpretations of Marx's thought. The objective here is merely to emphasize the insights that the two scholars draw from Marx's oeuvre and develop, in accordance with the principles of historical materialism, to provide an interpretation of the societal impacts of non-human objects as ultimately determined by social relations.

Indeed, although the two scholars do not construct a well-defined philosophical system for the interpretation of the relationship between, they certainly provide some fundamental tools to use to build further explorations. Addressing the «ontological cataclysm»[28] that comes together with the concrete catastrophes brought by climate change represents a necessary condition in order to be able to address responsibilities and held those who are causing this catastrophe accountable. In this regard, the conceptualization of the societal impacts of abiotic matter as a mediation of human agency can provide a strong basis for addressing the social origin of the global ecological predicament.

[26] Marx, 1990, p. 165.
[27] See Hornborg 2019, pp. 93-113.
[28] Hornborg 2019, p. 12.

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Labor, nature and totality in the Anthropocene
A dialectical critique of Chakrabarty's notion of labor-power and nature

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Abstract

The article offers a dialectical and Marxist critique of the concepts of labor and nature, as they are developed in the work of Dipesh Chakrabarty. More specifically, it starts by highlighting the relevance of Chakrabarty's approach for the contemporary 'neo materialist' debate, then it reconstructs his concept of labor-force in the context of the multiple histories by showing how its fundamental phenomenological and ontological approach, finally it shows how this approach is maintained in his later works on the Anthropocene. In doing this, the article highlights a dialectical interpretation as an alternative to ontological ones, by showing the contradictory double character of labor and of nature within capital's history and logic.

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Keywords: Dipesh Chakrabarty, Karl Marx, Labor, Nature, Anthropocene, Dialectics

1. *Introduction*

> Labor seems a quite simple category. The conception of labor in this general form – as labor as such – is also immeasurably old. Nevertheless, when it is economically conceived in this simplicity, "labor" is as modern a category as are the relations which create this simple abstraction.
>
> Marx 1973, p. 103

Chakrabarty's oeuvre, capable of connecting philosophy of history, post-colonial criticism and social history with the new challenges posed by the climate change, represents one of the most comprehensive philosophical attempts to the understanding of the so-called Anthropocene. As I will try to show, some of the key features of his approach have exerted a tremendous influence on and have been broadly absorbed by the vast majority of the current philosophical debate on climate change, especially the one that we may generally label as "neo-materialist". Given the diversity and richness of this debate, I cannot offer here a comprehensive definition of it. The difficulty of providing a unified definition of the new materialism is well known: the editors of the collective volume *New materialisms: Ontology, agency, and politics*, Diana Coole and Samantha Frost, even argue that it's impossible to provide a positive definition of "new materialism" due to the diversity of its constituent approaches[1]. Yet there have been different attempts in this direction. William E. Connolly has identified ten core principles, ranging from the recognition of matter's dynamism to the planetary dimension of social and natural phenomena[2], Erika Cudworth and Stephen Hobden have categorized the fundamental principles of new materialism into different sets of fundamental ideas[3], whereas Dolphijn and van der Tuin have generally defined new materialism as a transversal approach characterized by questioning dualisms – such as the mind-body divide – and advocating for an ontological monism[4]. Maybe we should abandon the search for a single definition, able

[1] Coole & Frost 2010.

[2] Connolly 2013.

[3] The centrality of matter and its self-organizing capacity, a speculative-realist approach and an ethics of 'cultivation'. See Cudworth & Hobden 2015.

[4] Dolphijn & van der Tuin 2012.

to encompass all aspects and positions of new materialism, and instead accept new materialism's internal diversity and consider it as a collection of distinct, partially incompatible trajectories of research. These latter nonetheless do not only share a common interest for a given set of issues but also some fundamental philosophical assumption and, perhaps more crucially, a common historical diagnosis: the idea that in modernity as such lies the root of the current crisis and the subsequent critique of the alleged "modern anthropocentrism" and it's fundamental subject-object distinction. In what follows, I will not delve into this debate, but rather try to illustrate how some implicit assumptions of this approach imply, perhaps unconsciously, the fallback to a nondialectical, and thus ultimately dualistic and abstract understanding of the relationship between human and nature, which undermines any attempt for a concrete and precise account of the peculiar intertwining between history and nature in the Anthropocene. To put it very briefly, the antithesis of subject and object should be grasped not ontologically, but rather historically, since its overcoming is not a matter of epistemological alternatives, but of historical processes.

As I will show, the broadly shared idea of nature's dimension as ontological "radical otherness", as well as the one of the Anthropocene as the process of a "growing divergence in our consciousness between the global – a singularly human story – and the planetary", are ultimately impeding to grasp the dialectical intertwinement of nature and history and, paradoxically enough, the also let us falls back into the "modern" dualism of nature as the other of culture. The urge to overcome dualism cannot be satisfied by overcoming it "in our consciousness" as long as our productive process, that is to say our historical condition, reproduce it on the material level.

To show a possible alternative to this approach, I will limit myself to outline some preliminary points, based on Marx's legacy, that we need to keep in mind in order to develop a unitary, materialistic and dialectical reading of the Anthropocene, here defined not so much as the new geological epoch when humans act as a geological force, but rather as the age that marks «the collapse of the age-old humanist distinction […] between natural history and human history» [5]. Thus, the Anthropocene forces us to retrieve and rethink the idea of natural

[5] Chakrabarty 2021, p. 26.

history, as mediation of these two poles. Obviously, in what follows I will be able to outline these key points only negatively – that is to say, through the critical discussion of Chakrabarty's positions.

First, I will briefly trace back the genesis of Chakrabarty's concept of nature within his postcolonial works, showing how, already in this context, the alterity represented by "divergent histories" is conceived according to an hermeneutical-phenomenological approach, rather than in dialectical terms. In particular, to demonstrate my claim, I will focus on the notion of "labor power", as it is considered in *Provincializing Europe*, showing how here Chakrabarty misinterprets Marx by separating aspects that in Marx are indeed distinct, but nonetheless dialectically mediated. The analysis of the concept of labor will indirectly shed light on the notion of nature too: for not only Chakrabarty's treatment of the concept of labor does follow the same interpretive models that he will later employ to think nature in his reflections on Anthropocene; moreover, with regard to a Marxist, i.e. dialectical understanding of nature, it is precisely in the concept of labor – interpreted not only as the metabolism with nature, but also as a socialized activity – that we can find the concrete moment of mediation between natural and human agency, between human and natural history.

2. *Divergent histories in the global history of capital*

As is well known, in his early works Chakrabarty calls into question the «idea of a general historical movement from a premodern stage to that of modernity», however this idea may be interpreted – for instance in the Marxist tradition as «uneven development» or as «structural causality»[6]. It is in this sense that, in order to pluralize the historical time, Chakrabarty criticizes the «'Marxist' historical narratives» too – even though, in other respect, his interpretation is heavily reliant on them: in fact, according to Chakrabarty most Marxist interpretations «share a tendency to think of capital in the image of a unity that arises in one part of the world at a particular period and then develops globally over historical time, encountering and negotiating historical differences in the process»[7]. Against this history (called «History 1»), which

[6] Chakrabarty 2008, p. 12.

[7] *Ivi*, p. 47. For a critique of Chakrabarty's subaltern history from a Marxist perspective, see Chibber 2013.

points at «the universal and necessary history we associate with capital», Chakrabarty opposes another «kind of past» (called «History 2») that includes «not only the relationships that constitute History 1 but also other relationships that do not lend themselves to the reproduction of the logic of capital»[8]: these historical antecedents «are thus not pasts separate from capital; they inhere in capital and yet interrupt and punctuate the run of capital's own logic»[9]. At first glance, this model seems to actually fit with a dialectical approach, in which, as Adorno puts it, universal history is conceived «as unified merely on account of its contradictions», as a «unity that cements the discontinuous, chaotically splintered moments and phases»[10]. The relationships that do not lend themselves to the reproduction of the logic of capital are indeed described as inherent to capital, and not as a radical otherness opposed to it. And yet Chakrabarty explicitly stresses that History 2 does «not constitute a *dialectical* Other of the necessary logic of History 1. To think thus would be to subsume History 2 to History 1. History 2 is better thought of as a category charged with the function of constantly interrupting the totalizing thrusts of History 1»[11].

It is in order to clarify this relation, that Chakrabarty introduces an original interpretation of the dual character of «labor power», in which he stresses the irreducible difference between the two distinct dimensions it entails: the «worker», on the one hand, as the embodiment of the «historical separation between his/her capacity to labor and the necessary tools of production» and, on the other, as the embodiment of «other kinds of past», other «ways of being in the world»[12]. The first dimension represents a «logical precondition for capital», namely labor as living labor-force, the «dialectical Other», as Chakrabarty puts it, of its abstraction in value: this aspect thus pertains to History 1, is subsumed to it as much as living labor-force is subsumed to capital.

Yet according to Chakrabarty, the contingent, historically determined elements that constitute the specific historical-material conditions of the living worker, should be referred to a dimension that is assumed as being at the same time external, pre-existent and irreduc-

[8] *Ivi*, pp. 63-64.
[9] *Ibidem.*
[10] Adorno 1973, p. 319.
[11] Chakrabarty 2008, p. 66. My emphasis.
[12] *Ibidem.*

ible to capital abstraction, thus belonging to History 2. In fact, even if the «disciplinary process in the factory is in part meant to accomplish the subjugation/destruction of History 2», «History 2 cannot sublate itself into History 1»[13].

A dialectical reading of the relationship between these two levels is actually suggested by Chakrabarty himself, where he clarifies that Marx's abstraction is «referring to a *process of deferral internal* to the very being (that is, *logic*) of capital»[14]: that is to say a contradictory, internally fractured and yet unified process. Chakrabarty also stresses the fact that the «difference» toward capital logic represented by History 2, «is not something external to capital», «nor is it something subsumed into capital», but rather «lives in intimate and plural relationships to capital»[15] itself. And yet, despite this plural and reciprocal relationship, in Chakrabarty's reading, the latter is defined as being incompatible with a dialectical process of «subsumption». As a consequence, in contrast to a dialectical interpretation, Chakrabarty chooses to frame the relationship between different historical dimensions as a process of *translation.* Unlike the notion of dialectical mediation, the idea of translation maintains the incommensurability between differences. The very act of translation, at least as Chakrabarty reads it, is based on the assumption that an integral transfers from one language to another is in principle impossible. Translation thus proceeds not dialectically, but rather in an inherently paradoxical way, maintaining «the possibility that these temporal horizons are mutually incommensurable»[16]. Accordingly, the dialectical «problem of historical transition» is reframed by Chakrabarty «as a problem of translation»[17]: «the transition from 'real' to 'abstract' is thus also a question of transition/translation from many and possibly incommensurable temporalities to the homogeneous time of abstract labor, the transition from nonhistory to history»[18].

According to Chakrabarty, a dialectical reading would necessarily imply not simply, as Adorno puts it, «the preponderance of anything objective over individuals»[19] but also the full subsumption of

[13] *Ivi*, pp. 67-68.
[14] *Ivi*, p. 65. My emphasis.
[15] *Ivi*, p. 66.
[16] *Ibidem.*
[17] *Ivi*, p. 17.
[18] *Ivi*, p. 92.
[19] Adorno 1973, p. 300.

the latter under the former: this is why different historical dimensions, including the one between global and planetary history in the Anthropocene, are to be described both as «incommensurabilities», as alternative chronologies that run parallel on different levels, as well as emergences «*within* the time horizon of capital».

3. *Nature "otherness" in the Anthropocene*

In fact, the same approach used to analyze labor-power, based on the incommensurability of different temporal orders, is employed by Chakrabarty to explain the emergence of natural agency of the planet in the context of the Anthropocene. According to Chakrabarty, in facing what he calls the « anthropocenic regime of historicity»[20], we are confronted with two historical realms incommensurable with one another: the «global» and the «planetary». Whereas the «global» has the «human at its centre» and deals with the political, social and economic aspects of human life, the «planetary» discloses a «vast process of unhuman dimensions», that «cannot be grasped by recourse to any ideal form»[21]. Despite all the differences, both the planetary dimension of climate change and the subaltern histories are conceptualized as «radical otherness»: «a background of relationships and time that necessarily cannot be addressed […] from within the global regime of historicity»[22]. The relationship between different historical dimensions *must* remain unmediated, otherwise it would mean to subsume one level under the other. Even though «the crisis of climate change calls for thinking simultaneously on both registers, to mix together the immiscible chronologies of capital and species history»[23], they represent «two different kinds of knowledge»[24], where the planetary one cannot be placed «in a communicative relationship with humans»[25].

[20] Chakrabarty 2021, p. 68.
[21] *Ivi*, pp. 86-87.
[22] *Ivi*, p. 89.
[23] *Ivi*, p. 42.
[24] *Ivi*, p. 86.
[25] *Ivi*, p. 70.

4. *Labor as negative internality of capital logic*

To understand the weaknesses of this model, let us turn to Marx and clarify first why the process of capital must be assumed as a totality, secondly, why the subordination it exert must be understood dialectically both with respect to living labor and with respect to nature: only a dialectical reading, in fact, can account for the fact that the capitalist process of abstraction and subordination is at once integral and partial, complete and incomplete and clarify why only by assuming totality as a material dialectical process is it possible for living labor, and nature, to emerge as elements of rupture in this historical logic.

As is well known, in Marx the abstraction process of capital implies the establishment of a novel category of labor: labor-power. Labor-power is *at the same time* the dialectical correlate of labor abstraction – as general possible expenditure of productive force – and the concrete living labor in its material, technical and historical specificity. To put it briefly, the worker is the living carrier of the labor-power. While Chakrabarty as we have seen agrees to this starting point, he seems to see a problem in the primacy assigned to labor-power as correlate of capital's abstraction: in his reading, abstraction not only never fully subsumes labor-power as living labor, but capital also maintains an own abstract and autonomous temporality that runs "in parallel" to the plural and concrete temporality of subaltern "lifeworlds". But what Chakrabarty seems to overlook it is the fact that precisely the unity of the process of abstraction, as a process of internal differentiation and contradiction, that allows us to concretely determine these moments as internal "differences" and "deferrals". If labor power is «the aggregate» of all «mental and physical capabilities existing in a human being, which he exercises whenever he produces a use value of any description»[26], as Paolo Virno points out, «what does this concept of labor force exclude from itself? The answer is: nothing, and that is exactly the point»[27]. The abstraction exerted by capital's logic from every particularity should not be understood as a kind of sublation of labor materiality, but as an abstraction in the form of value: just as the materiality of the commodity, also labor expenditure is always the particular, concrete activity associated with the specific

[26] Marx 1992, p. 177.
[27] Virno 2008, p. 85.

good produced. Only in a capitalist mode of production exists the abstract category 'labor', 'labor as such', and this means that *every possible specific form of labor can be abstracted in the form of a commodity*. The idea of labour «in this simplicity» is «as modern a category as are the relations which create this simple abstraction»[28]. Precisely because it is the abstract quality of labor, as labor power pure and simple, without regard to its particular qualities, that endows the commodity with its exchange-value, that capital can transform it in value without separating it from its concrete form. Labor never becomes something other than concrete labor, except as a value abstraction. If in living labor-force it is impossible to separate concrete, material labor from abstract labor, as well as in the commodity is impossible to split use value and value, then the dual character of the commodity coincides with labor's dual character, insofar as it is a commodity: a sensible, material thing which becomes an abstract and social value. Just as the use value of a commodity and its value, namely its qualitative body and its quantitative abstraction, are one and the same in the body of the commodity, which thus becomes a « sensuous things which [is] at the same time suprasensible or social»[29], so the abstract labor-force and the qualitative difference of the living human are embodied as one and same individual. This is why the Stories 2 that «interrupt the flow of its logic» are not only «inherent in capital,» as Chakrabarty writes, but can emerge as concrete historical alternatives only *within* capital's own dialectical, internally contradictory logic. Is the retroactive logic of capital which, already at the stage of production, distinguishes the quantifiable, abstract labor-force from the living, concrete living-labor: one could say that exploitment is precisely the extraction of this uniform labor force from differentiated and specific living labor[30]. This also means that the question of whether or not the qualitative dimension of living labor as difference is going to be fully subordinated to History 1 or not, should not be determined on the basis of a distinction between different realms of *being*, but within a comprehensive logic that articulates boths. According to Chakrabarty «History 2 cannot sublate itself into History 1» because «the everyday,

[28] Marx 1973, p. 103.

[29] Marx 1992, p. 165.

[30] Bellofiore speaks of «a priori socialisation» or «pre-validation of the use of labour power as virtual abstract labour». See Bellofiore 2018, p. 142.

preanalytical, unobjectifying relationships we have to tools» is a kind of «relationships critical to the process of making a world out of this earth»; for its being a sort of ontological «lifeword» that precedes the logic of capital, it is ontologically "inappropriable" by the capital[31]. Instead, History 2 may well be absorbed by History 1, and in this sense both its subordination as well as its transformative potential are to be decided not outside, but within the specific historical logic of capital: is namely the dialectical logic of capital itself that cannot but constantly produce its own negativity in the form of living labor. In this sense, are first and foremost the historical concrete logic of capital and its internal contradictions, not the life-worlds that precede it or that lay outside of it, that determine the concrete possibility of disrupting the process of valorization. In Marx, «modern industry, by its very nature, […] necessitates variation of labor», which can both «reproduce the old division of labor with its ossified particularizations» or, inversely, completely «revolutionize the division of labor within the society». Not an ontological alternative that "precedes" its logic, but only «the historical development of the antagonisms, immanent in a given form of production, is the only way in which that form of production can be dissolved and a new form established»[32]. The affirmation of discontinuities does not occur outside subsumption, but within it: «by means of co-operation» the capital creates «a new power, namely, the collective power of masses»[33], whose «power is due to cooperation itself»[34]. In fact, only «when the labourer co-operates systematically with others, he strips off the fetters of his individuality, and develops the capabilities of his species»[35].

5. *Conclusions*

Marx's approach toward the notion of labor allows us to set the basis for addressing in a more precise way the relationship between history and nature in the Anthropocene too. Indeed, not only, as Marx recalls in *The Critique of Gotha's program*, «labor […] is only the manifestation of a force of nature, human labor power» and thus,

[31] Chakrabarty 2008, p. 68.
[32] Marx 1992, pp. 488-491.
[33] *Ivi*, p. 331.
[34] *Ivi*, p. 334.
[35] *Ibidem.*

accordingly, a moment of nature itself; but as we have seen, it is only on the basis of the socialized forms of labor organization imposed by the capital that the "difference" between labor-force as abstract quantifiable force and living-labor as resistance to objectification is introduced. Now, it is only through the systematic interconnection thus established that becomes evident both the inherently natural-historical character of labor as well as the integration of nature as a negative moment of social reproduction. The capitalistic mode of production on the one hand «disturbs the circulation of matter between man and the soil», «but while upsetting the naturally grown conditions for the maintenance of that circulation of matter, it imperiously calls for its restoration as a system, as a regulating law of social production, and under a form appropriate to the full development of the human race»[36]. In other words, it is with the imposition of the capitalist system of production that it becomes possible to conceptualize the labor process as a metabolic process – at once social and natural – of the human species with nature, thus laying the basis for grasping such metabolism in a more adequate and conscious way – and eventually for modifying it. In order to determine the concrete and specific relationship between social and natural dimensions in the Anthropocene, it is thus necessary to start from the dual dialectical nature of labor, its cooperative structure and its mediation with nature as a form of metabolism. In fact, it is *within* the social and historically determined forms capitalist subordination, not from an "outside", that we may be able to activate the technical and social possibilities for a concrete emancipation, at once of the human and of nature, from the processes of destruction and exploitation; on a more modest, merely explicative level, only on this basis we can conceptualize the differential elements that qualify nature at once as a specific, negative moment of the human social system and, at the same time, as the totality that exceeds it. Only on this basis this dialectical notion of totality it will be (maybe) possible to modify these relations in a new way, appropriate to the full development of the human, now grasped as a moment of nature itself.

[36] *Ivi*, p. 507.

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A Gramscian Perspective in Ecosocialist Studies

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Abstract

The article proposes a Gramscian contribution to eco-socialism and degrowth communism, suggesting some of the Sardinian thinker's categories as tools for analyzing the current systemic and ecological crisis.

The analysis focuses on the responses of the dominant classes in the Anthropocene, which are seen as a passive revolution oscillating between reaction (represented by conservative and eco-fascist positions) and a "transition from above" (a technological ecological transition that doesn't challenge capitalism's logic of infinite growth). Both dynamics are attempts to reformulate hegemony within society to overcome an organic crisis.

To build an alternative – an "anti-passive revolution" – the text proposes key Gramscian categories: Hegemony, used to challenge the ideological direction of the dominant bloc; Factory Councils, viewed as a tool for socialist organization and the embryo of a new State, to be connected with degrowth communism and the commons and the "Regulated Society", posited as the final goal of self-governance and the gradual reabsorption of the State by civil society. A critical return to Gramsci serves as an impetus for rethinking the "great and terrible world", questioning capitalism in terms of production, the relationship with the planet, and the "conception of the world".

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Keywords: Antonio Gramsci, Ecosocialism, Degrowth communism, Hegemony – Passive revolution

1. *Introduction*

"The crisis consists precisely in the fact that the old is dying and the new cannot be born; in this interregnum a great variety of morbid symptoms appear"[1].

This famous quote by Antonio Gramsci perfectly describes the era we live in. Capitalism, amidst wars, pandemics, economic crises, and the acceleration of the climate crisis, is an agonizing system in which the survival of the Earth and all living beings is strongly at risk. The new – an alternative to capitalism not only in terms of production relations and forms, but also of values, of a "conception of the world", and of the relationship with the planet and other species – is slow to emerge, despite the increasingly urgent need for this radical change.

Although Gramsci never addressed the theme of the ecoclimatic crisis, many of his reflections can be useful for contributing to the theoretical and practical development of ecosocialism and degrowth communism.

2. *Nature in Gramsci*

Gramsci lived in a historical era when the climate crisis was not as evident as it is today, a time when the concept of the Anthropocene did not exist, and there is an extensive debate on whether to classify it as such.

In the few notes within the *Prison Notebooks* where he addresses the subject of the natural world, Gramsci presents an original gnoseological and ontological conception that aims to overcome traditional dualisms, particularly that between society and nature[2]. The philosophy of praxis (*filosofia della praxis*) – a term he used while imprisoned to refer to historical and dialectical materialism, both to circumvent Fascist censorship and to mark a theoretical difference from the orthodox Marxism of the time – does not represent a system that opposes or idealistically dissolves nature. On the contrary, it positively includes nature, rejecting both its exclusion (typical of a dualistic perspective) and its complete dissolution into spirit or history (as in certain forms of actualism). Gramsci does not conceive of man as an isolated

[1] Gramsci 1975, p. 311.
[2] Guzzone, 2023, pp. 48-49.

individual but rather as a complex of relations that includes not only himself and other men but also nature[3]. The dualism between society and nature is overcome by the conception of praxis understood as a compenetration of society and nature. "Nature in general" can only be conceived of as a comprehensible abstraction (*verständige Abstraktion*) that arises at a specific moment of historical development[4].

It is important to note that Gramsci criticized vulgar materialism for the lack of an autonomous scientific position of the philosophy of praxis with respect to the natural sciences. His polemic was directed, in particular, against Nikolaj Ivanovič Bukharin, one of the main theorists of Soviet communism at the time and author of *Historical Materialism: A Popular Textbook of Marxist Sociology*. Gramsci contested Bukharin's failure to establish an autonomous scientific position distinct from the natural sciences. The Sardinian revolutionary considered matter to be historically and socially organized for production, whereas for Bukharin, it was merely an economic productive element[5].

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Why Gramsci?

If Gramsci did not address the climate crisis, why then seek new insights in his reflections?

Gramscian thought, due to its peculiar character as an open and unstructured system, presents theories that can be useful for analyzing and understanding the present. However, in supporting this thesis

[3] Guzzone 2023.
[4] Guzzone 2023.
[5] Guzzone 2023.
[6] Gramsci 1975, pp. 1442-1445.

and venturing into this work, one must proceed with caution. Taking Gramscian thought and adapting it to the present day can be a forced interpretation that benefits neither us nor Gramsci[3].

To perform this operation, first of all, a deep philological study of the Gramscian texts is necessary, essential for understanding which categories can be "translated" to the present day. By "translation," Gramsci meant not the mere use, appropriation, or incorporation of terms and concepts from other theories or fields into the "philosophy of praxis," but rather their reinterpretation and transformation through the critique of the theme under analysis.

Gramsci can be useful to us in the study of Marxist dialectics, without neglecting the limits of his reflection. Gramsci can be useful for deepening Marx's philosophical reflection, but he can also be a tool for stimulating new reflections useful for analyzing and understanding the contemporary world. Hegemony, factory councils (*consigli di fabbrica*), dominant and subalterns, passive revolution, integral State, and regulated society (*società regolata*) are important categories that can still be useful to us today.

The Anthropocene

Before explaining how and why these conceptions can be useful in the analysis and overcoming of the Anthropocene, let us briefly summarize the current situation.

For reasons of space, synthesizing the current situation shows that the dominant classes in advanced capitalist countries, primarily those of the North Atlantic pact but not exclusively, are today oscillating between reaction and an ecological transition from above.

The reaction is represented by the spread of increasingly conservative and protectionist political positions aimed at defending the economic *status quo*, and the formulation of a new hegemony that defends a purported traditional culture against the so-called "woke culture". This process is expressed through figures like Trump, Meloni, Milei, Zionism, and the general advance of reactionary forces that openly wink at fascism. In the case of Trump, moreover, there is also evident support from the financial and technological oligarchy, which inevitably has concerning implications in terms of class power and democracy. In ecological terms, this reaction represents a clear willingness not to address the climate crisis, to preserve the interests

of fossil capitalism, delaying ecological reconversion, and to utilize the governability of extreme events as an opportunity for profit for the dominant classes.

Israel is configured as an integral State[7], where the deep interpenetration between the Political Society (coercion) and Civil Society ("private" organizations) has allowed the assertion of Zionism, an openly totalitarian and reactionary ideology.

Zionism is identifiable as the vanguard of reaction and planetary destruction, fueled by a hyper-destructive and extractive model. In the report *From economy of occupation to economy of genocide*, Francesca Albanese defines the colonial economy in the West Bank as systematically extractive, based on the consumption of Palestinian resources (land, water, minerals), which is essential to the settlement project[8].

The military operations in Gaza generate structural environmental damage, producing over 37 million tons of rubble in five months[9], contaminating water and soil with heavy metals and toxins[10]. The UN indicates that only 1.5% of Gaza's soil remains arable[11], a collapse that enforces total dependence on humanitarian aid.

The material sustainability of the conflict is ensured by a massive consumption of energy and resources, supplied by multinational corporations and supported by Western capital (the so-called "carbon footprint of the war")[12]. The sheer scale of the physical destruction highlights the energy-intensive nature of the operations.

This environmental catastrophe, in addition to being a humanitarian one, is functional to the ethnic cleansing project, as the devastation of survival systems precludes the possibility for Palestinians to return to their lands.

Finally, this black wave does not conceal the clear intent to restrict social and civil rights. When it becomes too late to arrest climate collapse, eco-fascism could become a concrete response by the dominant classes to this organic crisis.

The ecological transition from above, conversely, presents itself as an attempt to solve the ongoing environmental and climate crisis without challenging capitalism and its logic of progress, understood as

7 Gramsci 1975, p. 460.
8 Albanese 2025.
9 Albanese 2025.
10 Albanese 2025.
11 Altreconomia 2024.
12 Albanese 2025.

infinite growth. The ecological crisis is conceived as a problem that can be resolved by delaying its effects as much as possible through the recourse to new technologies, capable of reducing emissions, reabsorbing CO2, and postponing the effects of global warming. In the most Eurocentric vision of this conception, the aim is to reduce the impact of emissions by offshoring pollution and misery to countries that occupy a subaltern position in the imperialist pyramid[13]. This perspective not only refuses to question capitalism and the consumerist logic that pervades our society today, but it presents an opportunity to exploit the ecological transition as a moment to renew the cycle of accumulation, profiting from the opening of new markets, the further development of the means of production, and, once again, from the management of the ecological crisis.

Gramsci in the Age of Climate Crisis

In this paragraph, we will analyze three important Gramscian categories: Hegemony, passive revolution, regulated society, and Factory Councils.

Hegemony is the category that, more than any other, allows us to open a breach into the present, to bring Gramsci into the Anthropocene. For Gramsci, hegemony is, first and foremost, the hegemony of the dominant bloc; it is necessary to understand the dynamics at its foundation to grasp how to contest the direction of society from the dominant groups. Gramsci represents hegemony with this formula: "State = political society + civil society, that is, hegemony armored by coercion"[14], which signifies the repressive element being flanked by the capacity for ideological direction in society through the hegemonic apparatuses, the State, and the ideological construction that takes place through the control of the means of production and the elaboration and diffusion of "conceptions of the world"[15].

This is understood not only as the exercise of violence to defend the established order but also as the conscious and organized construction of "fortresses" and "casemates" behind which to entrench power in civil society[16]. Civil Society, identified by Gramsci as "the

[13] Saito 2024, p.64.
[14] Gramsci 1975, pp.763-764.
[15] Gramsci 1975, p. 1378.
[16] Gramsci 1975, p. 866.

ensemble of the organs of the superstructure that allow for the intellectual and moral direction of society," is the container in which ideologies are elaborated and disseminated and where the consent of subaltern groups is obtained. Hegemony, as a function of direction, is no longer understood as strictly confined only to Civil Society, but extends, in various forms (such as educational and cultural functions), also to the State apparatus in the strict sense. The Integral State embraces the dialectical nexus of unity-distinction between State and Civil Society, implying that modern government, to be effective, must incessantly "educate" consent, mobilizing energies through "private" institutions and acting as an "ethical State"[17].

Finally, this black wave does not conceal the clear intention to contract social and civil rights. When it is too late to halt climate collapse, eco-fascism could emerge as a concrete response of the dominant classes to this organic crisis.

The ecological transition from above, conversely, presents itself as an attempt to resolve the ongoing environmental and climate crisis without fundamentally challenging capitalism and its logic of progress, understood as infinite growth. The ecological crisis is conceived as a problem that can be managed by delaying its effects as much as possible through the adoption of new technologies, capable of reducing emissions, reabsorbing CO2, and postponing the effects of global warming. In the most Eurocentric view of this conception, the goal is to reduce the impact of emissions by offshoring pollution and misery to countries positioned as subaltern within the imperialist hierarchy. This conception not only avoids questioning capitalism and the consumerist logic that currently pervades our society, but it is also framed as an opportunity to exploit the ecological transition as a moment to renew the cycle of accumulation, drawing profit from the opening of new markets, the further development of the means of production, and, even in this case, from the management of the ecological crisis.

The process of managing the ecological crisis can be interpreted through the Gramscian category of passive revolution or "revolution-restoration"[18]. Recalling Marx's *Preface to A Contribution to the Critique of Political Economy*, for the Sardinian thinker,

[17] Gramsci 1975, p. 460.
[18] Gramsci 1975, p. 954.

> The concept of passive revolution must be deduced rigorously from the two fundamental principles of political science: 1) that no social formation disappears until all the productive forces that have developed within it find room for further progressive movement; 2) that society only sets itself tasks for whose solution the necessary conditions have already been incubated, etc. It is understood that these principles must first be critically elaborated in their full scope and purged of any residual mechanism and fatalism[19].

Passive revolution, therefore, is to be understood as the re-articulation of hegemony by the dominant classes during a phase of organic crisis, which may also lead to a further development of the means of production. The passive revolution oscillates between progressive moments, such as reforms, partial involvement of subaltern groups, or the further development of the means of production; and regressive moments, such as dictatorial or openly fascist governments.

Both of these moments contribute to reformulating hegemony, but in its progressive version, passive revolution assumes the characteristics of a further development of the means of production[20] that also allows for arresting the tendency of the rate of profit to fall and, thus, renewing the cycle of capitalist accumulation. Returning to the reflection on the current phase, we can read the conservative wave as a passive revolution with a primarily regressive character, and the hypothesis of an ecological and technological transition that does not challenge capitalism and the logic of infinite growth as a passive revolution with a primarily progressive character. In both cases, the objective of the dominant classes is to emerge from the organic crisis we face, which risks transforming into a crisis of hegemony for the capitalist system.

Into this discussion is also inserted the European rearmament plan, which foresees over 800 billion invested in armaments and military research, as another attempt by the dominant groups to escape economic stagnation by utilizing military reconversion as a tool for the renewal of the means of production. In the name of this process, the choice has been made to forgo the ecological transition, convinced that rearmament is the right path for the economic and productive revival of Europe, sacrificing the environment and humanity on the

[19] Gramsci 1975, p. 1774.
[20] Gramsci 1975, p. 1312.

altar of profit. According to a report by Scientists for Global Responsibility, the increase in military spending by NATO countries up to 3.5% of GDP risks generating 1,320 million tons of CO2 over the next decade[21]. Such a process requires an enormous hegemonic effort to convince European subaltern groups that the cutting of the welfare state, the creation of new public debt to finance this project, and the environmental impact that rearmament will have are in their interest.

Among the most interesting theorizations that can represent a new conception of the world is certainly degrowth communism. Specifically, K. Saito, in his *Capital in the Anthropocene*, supports this theory and links to it the concepts of the commons and workers' cooperatives as a development of forms of planned, solidarity-based, ecological economy and a transition to socialism[22]. This hypothesis, while interesting, does not, however, address the issue of the replacement of the old power with the new, which remains vague and seems to be based mainly on greater democratic participation of subaltern groups.

Also in this case, a Gramscian theory can be useful: the Factory Councils, theorized by Gramsci during the *Biennio rosso* (1919-1920) and applied by the Turin workers in the factories[23]. The Councils are not only a tool for the organization of production in a socialist sense, but were also conceived as the embryos of the new socialist State, from whose coordination socialist power was to arise, as a reunification of economics and politics. The Councils, therefore, are an instrument that negates the power of the capitalist State and stands as the foundational instrument of a new State[24]. Connected to the theorizations on degrowth communism, by developing democracy in decision-making processes (in line with the Gramscian vision) and to the commons, if adapted to the characteristics of contemporary society, the Councils can be a valuable tool for rethinking our society in a socialist sense. Finally, the Councils can also be a fundamental tool for recomposing the fracture between State and Civil Society present in capitalist society.

The last Gramscian category that can be useful to deepen the debate and open new perspectives is that of the "Regulated Society", the name by which the Sardinian revolutionary indicated communism. It represents not only an attempt to evade censorship in fascist prisons

[21] Eunews, 2025.
[22] Saito 2024, p. 267.
[23] Liguori 2020.
[24] Liguori 2020.

but a rethinking of communism as the expansion of forms of self-governance in socialist society that permits the gradual reabsorption of the State by civil society, meaning the disappearance of the repressive and bureaucratic element typical of every State.

An "Anti-Passive Revolution" to Escape the "Great and Terrible World" We Live In

In this brief exposition, I have limited myself to presenting what could be some of the Gramscian categories that can be useful today in the struggle for a different society. Many other categories exist, such as those of the intellectual or the party, which could equally be part of the conceptual toolkit of our time but which, due to lack of space, I have had to neglect.

In the "great and terrible world" we live in, there are no simple "solutions." This, however, does not mean surrendering to the present state of affairs and giving up on building an alternative, but rather looking at the past with a critical eye and striving to analyze the present with lucidity. First of all, it is necessary to become conscious of the processes underway, beginning to reason about an alternative that challenges capitalism in terms of production, the relationship with the planet and other living species, and, above all, the conception of the world. It is necessary to recognize that the enormous technological and productive development, if it continues to remain at the service of individual profit rather than collective well-being, will have no social function, transforming instead into a tool for the further subjugation of subaltern groups to capitalism. It is essential to oppose the individualistic and hyper-competitive vision – to which the new generations, especially those born after the dissolution of the major communist parties and the collapse of "real socialism" in Europe, have been educated – with a communal vision.

In this rough journey, the thought of Antonio Gramsci can be useful for rethinking the "great and terrible world" that lies before us. A return to Gramsci should not be conceived as a search for messianic truths or a return to a new orthodoxy, but as an impetus to stimulate new reflections and broaden our vision of the present. By starting again from Gramsci, it is possible to lay the foundations for an "anti-passive revolution"[25] in the Anthropocene.

[25] Liguori 2012, p. 236.

In conclusion, I believe that the conceptions summarized here, albeit schematically and didactically, can contribute to a further qualitative leap in studies on the transition to socialism-communism and the recomposition of the metabolic rift with nature.

"I have convinced myself that even when everything is or seems lost, one must calmly set to work, starting again from the beginning"[26].

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[26] Gramsci 2023, p. 132.

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Second Part

Ecosocialism and Economics

First Section

Ecosocialism

Extraction Ecologies in Medieval Venice: Nature, Speculation, Painting, and the Gesture

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Abstract

This paper looks at the specific political economic conditions of 16th century Venice and seeks to connect these with the introduction of the gesture in painting. Arguing that the production of "nature" and its exploitation via increased accumulation, and management of resources are enacted in Titan and Tintoretto's painting via the expanded and abstracted gesture. I outline the development of financial and quantification techniques in Venice and Italy during the 15th century and ask if these were echoed in painting, that draws from nature while codifying it. Arguing that by looking at paintings made during the emergence of capitalism we can better understand the interaction of the economic and the ideological and locate painting as one such technique. By identifying the gesture in painting as speculative, we can read it through systems of fictitious capital that seek to capture future labour and nature, which underlines the role of credit for emergent capitalism. Arguing against previous conceptualising of the gesture as labour-time, to suggest instead it mimics the abstraction of future labour time in finance capitalism. I portend that by understanding more about ecological thinking in the emergence of capitalism we can better frame our ongoing metabolic rift.

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Keywords: Venice, Speculation, Painting, Gesture, Ecology

Painting as we currently know it, as a discipline, that takes the form of a frame with canvas and the use of a ground and oil paint reached this specific form at the end of the 15th century in Venice and was progressively developed by the Venetian painters over the 16th century. The gesture as a formal device used to infer form, movement or light in a painting is differentiated by its non-mimetic function, by its simplification and its signature brush strokes, that have long harked back to the touch of the artist. It is in the works of the Venetian painters, specifically Titian and Tintoretto, in the mid to late cinquecento that we see the first intentional gestural paintings.

This paper focuses on the specific political economic conditions of late medieval Venice, and the conditions in which the gesture emerges. My proposal is that the gesture is connected to the established financial conditions of mercantile Venice, and its transformation into an industrial centre and its interconnection with the wider European emergent capitalist forms of value production in the long 16th century. But that this emergence does not exist separate from land, nature and ecology, but forms a dialectic between the two, as Pepijin Brandon explains:

> Land is the main source of wealth of all preceding ruling classes. It is the material foundation of subsistence economies and the communities on whose labour they are based. It is the first point at which nature itself intervenes in production and sets its ecological barriers on capitalism's social metabolism.[1]

In light of our current ecological crisis, and this conference, we need to look back at the historical formulations and conceptions of nature, as it emerges alongside capitalism. In the late medieval period nature is abruptly disconnected from the human world. This paper argues that we can look to artwork from this period as both representative of these shifting ideologies but also embodying them in specific aesthetic and technological developments. Jacopo de' Barbari formidable woodcut *Bird's-Eye View of Venice* (1500) captures not only the city as island in detail but building on Fra Mauro's map develops the technologies of seeing, surveillance and capture.

By looking at the way 15th and 16th century instruments of finance, industrialisation and management are intimately connected with land, resources or what could be called nature, that includes the human

[1] Brandon 2009.

body, we reanimate the land question as implicated with finance capital from the beginning. Part of this process of management is the process of abstraction, creating what Jason Moore describes as "abstract nature" (2015). In painting from the long 16th century, we see a turn to nature, to the natural world in art, a mimesis, as part of a symbolic ordering and enclosure. Alongside techniques for map making, bookkeeping and measurement. Albrecht Durer explains that there is art in nature and "he who can extract it, has it".[2] Jason Moore writes that:

> Early Modernities epoch-making abstractions were registered through the era's new cartographies, new temporalities, new forms of surveying and property making, schools of painting and music, accounting practices, and scientific revolutions.[3]

The process to capitalism is therefore about knowing and quantifying this thing called nature, and as Alfred Sohn-Rethel explains:

> Looking at nature under the categories of the commodity form, science affords precisely the technology on which hinges the controlling power of capital over production. It cuts up nature piecemeal by isolating its objects of study from the context in which they occur, ignoring nature in its importance as the habitat of society.[4]

What is significant about the early 16th century is that the conditions of rationalisation and rejection that Sohn-Rethel and Moore describe above are still in their emergent state, there is still a remaining religious and cultural worldview of humans as part of metabolic whole, totalised by the framework of god. The long sixteenth century is often identified as the century where the specific conditions of capitalism emerge, this debate is far too onerous to rehearse here, but in terms of this research I draw on the work of Giovanni Arrighi (2010) and Jainus Banaji (2020) to concur that while the specific modalities of industrial capitalism are clearly defined in the 18th century, the proceeding centuries laid the ground for the development of capitalism, and in many city states and empires we see hallmark signs of proto-capitalism. Venice is central to many of the above abstractions, from map makers, to

[2] Van Maelsaeke 1969, p. 50.
[3] Moore 2007.
[4] 1978, p. 179.

bookkeeping to printing houses, to land laws and art. As Jainus Banaji writes: "Venice was Europe's largest bullion market before the arrival of American Silver",[5] which was why the Florence Merchant bankers made the 'Rialto Europe's pivotal exchange market' in the 14th century, and by the 15th it was the centre for trade in cotton and spices.

Arrighi explains that after the Treaty of Lodi in 1454 Venice rapidly industrialises becoming the leading manufacturer in Europe.[6] But this industrialisation is also accompanied by the control and use of the terraferma, the wider lands surrounding Venice, and the colonisation of islands in Greece and parts of Turkey. So, here industry and primitive accumulation becomes interconnected. After Venice loses its spice trade monopoly to Portugal in the early sixteenth century, and the battle of Agnadello to Louis the 12th its state craft and trading empire was over, and it rapidly transformed into a centre of industry.[7] Its legacy as a centre of trade and finance still remain important through the 16th century,[8] but this period in which the gesture emerges is also defined by crises.

Venetian painters such as Giorgione, Titian, Tintoretto and later Venice trained El Greco, rejected the Florentine painters' system of design, and focused on colour (Steinberg and Wylie, 1990). Employing layers of glazes that mimicked the natural light of Venice and its surrounding lands. At the same time they developed both the means of painting on canvas, it a readily available commodity because of Venetian ship building, but they also employed techniques developed in the Northern Renaissance, through the use of oil paint. This combination meant that suddenly a painting was no longer attached to a wall, to a church or building, it could be taken off its frame and rolled up and exported on mass. This technical innovation saw an explosion of paintings made and sold.[9]

With oil they could paint *a la prima*, and build layers and put paint directly onto the canvas in larger amounts. Painting as a conspicuous commodity increased, and an larger number of works were made for private commission which meant that themes and subject matter was increasingly non-religious,[10] as paintings moved out of churches.

[5] Banaji 2020, p. 21.
[6] Arrighi 2010, p. 131.
[7] Romano 2024.
[8] Panciera 2006.
[9] Panciera 2006.
[10] Panciera 2006.

Painters like Titian become part of a network of European power, painting for the Hapsburg's. Titian is there bearing witness to the Iberian revolution and the beginning of the Atlantic slave trade, and his own city's industrial growth.

Pero Trafur describes his trip to the ship building factory the Arsenale in 1438:

> when the galley had reached the end of the canal all the men required were on board, together with the complement of oars, and it was equipped from end to end. In this manner there came out ten galleys, fully armed, between the hours of three and nine. I know not how to describe what I saw there, whether in the manner of its construction or in the management of the workpeople.

his highly productive industrial city-state also developed governing and corporate methods of managing its energy and resources: in wood and water, and enclosing forests and waterways in the now expanded *terraferma*. Karl Appuhn explains that the management of the forest reserves during the 15th century reflected developments in mapping, and an understanding of how to manage a forest so that it continued to yield.[11] The same is true of water, both fresh-water sources and the channelling of waterways in the canal.

Venice had developed its systems of merchant trade and banking over centuries, while it had a monopoly over the spice trade. Ideas of insurance and banking brought from the Florentine bankers, with credit, and loans meant that emerging ideas concurrent with speculation flourished. Credit notes and bills of exchange were used to represent future commodities, traded commodities, and future labour. These technologies of finance within Venetian merchant capitalism created a system of representation, of real concrete things in abstract formats, that also inferred that payment could be received at a later date.

Stefania Montemezzo identifies that bills of exchange dramatically increased as trading networks and banks spread across Europe, and as she demonstrates in Giovanni Foscari's ledger from 1463, the specific quantification in number and value of specific material goods, such as a slave, monkeys, wool, leather, which all relate to an uncommodified object in nature, that has been transformed into a commodity.[12] It is

[11] Appuhn 2010.
[12] Montemezzo 2025.

here in the bookkeeping technologies of Venice's merchants that the intricate ledgers of the Portuguese, Spanish, Dutch and English catalogued the millions of bodies of African slaves they steal a hundred years later. Unlike barter, bills of exchange transform materials into an abstract number on a note. Venetian double entry bookkeeping is premised on a meticulous keeping of books that requires that the accounts are balanced constantly with the debit and credit of the merchant. This system was laid out in Luca Pacioli's *Particularis de Computis et Scripturis* (1494), that became a best-seller, printed in Venice's expansive publishing houses.[13] We can see Pacioli depicted alongside a figure that is rumoured to be Dürer (another mathematical writer from the period) in Barbari's painting from 1496. The stance and actions mirror that of a saint and situate his mathematical abilities as almost divination. The early adoption of Hindu numerals, influenced by Venice's long trade relationship with Islamic states, should also not be overlooked, the system of Venetian Bookkeeping was dramatically improved by being able to add and subtract large numbers, before this it would be just continued notation of roman numerals and counting instruments. Venice also developed the first government bonds to support with debts and costs incurred through war; money was loaned from individuals and interest paid until the full amount was paid back.[14]

While Marx's focus is on the radical transformation to industrial capitalism and the separation of peasants from the means of production,[15] he is keenly aware of the role that merchant and commercial capital along with both usury and credit made to the transition to capitalism proper.[16] However, he sees usury as linked to production systems where small producers still own some of the means of production, which it could be argued that the guild systems in Venice represented. However, Banaji[17] and others have emphasised that many of the producing states used merchant-controlled production centres, where the wage made up the workers livelihood, and these workers were often very much part of the reserve army made up of migrants and bonded labour. Conditions for most in the production

[13] Gleeson-White 2011.
[14] Graeber 2011.
[15] Marx 1976.
[16] Marx 1981.
[17] Banaji 2010.

houses of Venice was not the secure position of the guild. The nature of Venice's geography also meant that workers could not substitute their livelihood with access to the common and relied fully on their wage. Paolo Malanima has also argued that Italy was in fact ahead of other European nations in separating peasants from their land and using wage systems and sharecropping.[18]

Within the merchants of Venice's practices, you can clearly see a M-C-M system emerge and the M was beginning to feed into the way the C was made. M was also beginning to develop beyond money capital into fictitious capital through developments in financial systems. These early forms of fictitious capital relied on the natural or material, before absolute and relative surplus value were properly implemented in controlled work conditions. This connection means that we could say that the value form was feeding into the control and production of nature. The management of nature was not only land and resources, but was a supply of labour, that through Venice's active state-making/trade making wars that accelerated in the 15th century meant that a regular supply of stateless, migrant, and slave labour was in the hands of the Republic.

Rebecca Carson's book *Immanent Externalities* gives us a new framework for looking at the relationship between finance and nature, or spheres considered outside of the exchange relationship, such as social reproduction. Because fictitious capital, or finance capital always has a relationship with the future, it has she says a relationship with social reproduction that is both immanent and external, and I quote:

> A crucial part of the legitimation of fictitious capital relies on the constitution of a corresponding subject who lives a life pathologically driven towards the ability to repay, and pay for, what has been credited to them.[19]

And she continues…

> [i]f future labour is indefinitely absent, the necessity to reproduce pending labour remains. Hence, whether or not fictitious capital is repaid […] society must nonetheless act "as if" it will be repaid in

[18] Malanima 2022.
[19] Carson 2024, p. 27.

> the future. Social life must reproduce in the present in such a way as to be able to both continue to exist in the present and to produce individuals who are able to repay debts in the future.[20]

Where the focus of Carson's argument is a labouring subject and its need to be reproduced, the same system of immanent externality can be applied to the natural world and its subject/object, materials, or as Moore calls it abstract and cheap nature. The idea of nature being able to repay its debts is part of the internal logic of finance, as the initial forms of banking in Italy were set up to insure against bad nature – a bad grain season for example. So, finance is part of an inbuilt logic of what constitutes an understanding of nature as asset, as resource in the emergence of capitalism. At the same time there is a temporal contradiction, as with the social reproduction of the worker, capital does not invest in natures longevity, even if some quasi-ecological practices were looked at in Venice, the only answer to this inherent contradiction is continual and expanded enclosure.

The colour in Giorgione and Titian's paintings, the apparent naturalism of light that Michelangelo accused of 'counterfeiting life' and Vasari suggested it was merely 'stamped from life' provide us clues to an emerging order.[21] The fact that they use terms openly applied to financial systems, of counterfeiting money, and stamping bills of exchange, suggests a rupture of the previously holistic order of man in nature by extracting it onto the canvas. These paintings enact M-C-M, but through a synthesis of the symbolic and the material: the buying of material from wider trade networks of the Mediterranean (that represents concrete material and labour), the codifying it into the natural world in the technology of painting, and then the painting again in circulation: but as double, a commodity to be traded and the information within in that contains, controls and knows the nature within it.

At a time where art and science, aesthetic and arithmetic were seen as co-habitual, systems of aesthetic knowing and response to the world fitted under the same rubric as calculations. So, the emergence of the gesture at this time cannot be understood as separate from wider developments in quantification, finance and the mana-

[20] Carson 2024 p. 31.
[21] Steinberg and Wylie 1990.

gement of nature. In reading the gesture it is easy to position it as either the expression of the artist, the act that directly links to their individual (capitalist) subjectivity, as separate from the world of craft, or as something symptomatic of the act, of the body, as a type of artistic labour. But I want to argue that it is neither, even though these factors play a part in arts historiography. The gestural painting takes less time, is less laborious than the smooth, glazed painting, it relies less on the repetitious body movements, which is why arguments that centralise labour don't entirely account for its nature. There were in fact debates at the time of Titian's late work around this apparent deskilling – around what was perceived as a painting being less valuable as less time was spent on it.[22] Therefore, could we propose the concepts of fictitious capital and speculative capital as a new way of reading the gesture? Sohn-Rethel sees in *Titian's Christ Crowned with Horns* (1576) an animation of automation that is inherent to the value form, a form that self-animates that as Beverly Best has expanded in relation to Marx to becomes an automatic fetish,[23] that must move, must circulate. It is within this transformation to exchange value within an aesthetics of automation that we can locate the gesture, and I want to propose that the gesture can be more comprehensively understood through the concept of speculation and fictitious capital.

The unknown and in many ways intrusive act of the gesture speculates. Speculate coming from the Latin *specere*, meaning to spy, the gesture is able to move forward and back in time. It calculates the future labour/nature to be recalled at a later time as Carson explains. The gesture and speculation are in many ways a gamble, a game of chance, for both the painter and financial speculator. But what histories of capitalism tell us is that often speculation is related to land, or real estate. Land as quantified retroactively feeds into the gesture, its value unknown its meaning unsure, but its automatic immanent necessity assured. To read painting through networks of both finance capital and the natural world requires both an understanding of the quantification of abstract nature in the market, and the role they play as material agents, and finally the joining of these two elements in the action of the gesture.

[22] Cranston 2010.
[23] Best 2024.

Giorgione was influenced by Leonardo's attention to nature, and observational drawing, and Dürer's attention to the landscape itself as subject. Here landscape becomes one of the first transitions to the process of employing the gesture, here the landscape becomes as Sohn-Rethel suggests a second nature, that seeks to capture the first. In Giorgione's famous work *The Tempest* (1508), we have nature as the stage to which systems of order and accumulation vie with the natural world. The painting is a set of interactions, a set of contestations. The reproductive body of the woman seated next to the worker, with the natural world contesting the imposition of the forms of domination in the building and the bridge. This painting represents the threshold of a new century of accumulation all based on the exploitation of the natural world in the same way that Joseph Wright of Derby depicts the English Textile mills – much less than satanic in *Arkwright Mills* (1796). Each work sets the extraction of both labour power, and reproductive labour within the natural world. It portends specifically to the resource on which the forms of extraction rely.

The connection between the new instruments of quantification and the natural world is made even clearer in Giorgione's *Three Philosophers* (1508), where the wise men of antiquity, the Arab scholars of mathematics, and the young man of renaissance humanism all carry their methods of quantification, ways of knowing and seeing the world. It is as if Giorgione knows his painting itself is part of this same regime. The tools that the philosophers use are the same ones employed in the markets of the Rialto with bookkeeping and insurance. The young man stares into the dark cave, we have a foreboding sense of the darkness that such knowledge can bring. Titian, like Bellini before him, began including large areas of landscape in his work, making the landscape part of the work, and not merely a setting, seen in the painting *Noli me Tangere* (1511-12), but by the time Titian works on his Metamorphoses series in the mid-century there is an effort to merge and blend man and beast, and man and landscape. Seen in the *Pardo Venus* (1551), the landscape, that is both natural and cultivated inhabits the entire scene, and it is through the dynamism of the forms and the blending of humans and animals that the reliance on gesture and colour takes centre stage. The treatment of the waterfall, as gesture and brushstrokes of white reverberate around the picture plane, like the initial sparks of automation. Or significant entries in a ledger.

It is not until the 1570's that the gesture begins to envelope the entire picture plane, seen in *Death of Acteon* (1570) and *St Jerome* (1575), holding together the scene, the treatment of trees and drapery are made up of quick and energetic brush strokes that skim over the more densely constructed weave of the canvas. The choice of the subject as a hermit and the Greek myth set in the natural world allow freedom in the composition and treatment of content. In very late work by Titian and Tintoretto the white gesture becomes almost spectral on the canvas in Titians *Pieta* (1576) and Tintoretto's *Baptism of Christ* (1578), it moves independent of the composition to infer an automatic subject, a system of M-M that covers the picture plane in a web like structure enclosing and valorising each subject. The subject of man in the landscape has been codified in the very gesture, as the scenes are set in the night, where the chiaroscuro becomes enforced. The gesture doesn't simply infer an object, but it traces the past and future actions of each body. Here systems of fictious capital instrumentalise the actions within the scene, here the action continues frenetically, unable to stop as it must meet the needs of the future labour it has already projected into the books.

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Ecomarxism in Italy, roots and perspectives

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Abstract

Even before the emergence of the 'environmental question' on the institutional political scene a significant and original cultural tendency and environmentalist activism developed in Italy on the Marxist left. Here, we offer a brief overview.

Bio: Paolo Cacciari is an Italian politician, journalist, and writer, born in 1949, known for his environmental advocacy and work on the theory of degrowth. He holds a degree in architecture and has been a professional journalist since 1984. His political career includes serving as a councilor and assessor for the environment for the city of Venice, and he was a deputy in the Italian Parliament for Rifondazione Comunista from 2006 to 2008. As Venice's environmental official, he voiced strong criticism against major engineering projects like the MOSE flood barriers in the Venetian lagoon.

Franco Ruzzenenti is an Italian environmental scientist and associate professor in Energetics of Complex Systems, the Programme Director of the MSc 'Energy & Environmental Sciences' (EES-MSc) and the Director of Education of the Energy & Sustainability Institute Groningen (ESRIG), Nether-

lands. He earned a degree in Environmental Economics from the University of Siena in 2001 and later completed a Ph.D. in Environmental Chemistry at the same university. His interdisciplinary research focuses on complex systems, network theory, energy modeling, industrial ecology, and the rebound effect, aiming to understand the transition to a low-carbon society.

Marino Ruzzenenti is an Italian historian specializing in contemporary history and environmental issues. He collaborates with the «Luigi Micheletti» Foundation in Brescia and has published several works on contemporary history, with a particular focus on environmental themes. He is a recognized expert on the industrial history of Brescia and its environmental crises, notably authoring a book on the Caffaro chemical plant disaster, one of the worst PCB contaminations in the world. His research has also analyzed the significant role of the Brescia incinerator, the largest in Italy, in expanding the local waste business.

Keywords: ecology, Marxism, capitalism, society, degrowth

1. *From naturalist protectionism to human ecology*

Ecology, when the term was first used in 1866 (Haeckel, 1866), was a branch of biology, under the influence of Darwinism, and manifested as naturalist protectionism (Ruzzenenti 2024).

In the highest phase of the '30 glorious years' of the 20th century (1945-1973), ecology also became a human science. It was the only period in which capitalism was forced to come to terms with the demands for social justice and the emancipation of workers and populations, supported by the workers' movements in the North, and the liberation movements from colonialism of Marxist inspiration in the South. But that period also manifested a dark side, namely the excesses in the degradation of nature, both through withdrawals that impoverished it and the waste that polluted it. Ecology was rediscovered by scientists and men of culture who had come close to Marxism, who wrested it away from the 'environmentalism of the countesses' and turned it into a 'subversive' science, an integral part of the great transformation movement underway, such as, for example, Barry Commoner and André Gorz.

2. *The Italian case of the encounter between Marxism and ecology*

Italy went abruptly from being a poor and predominantly agricultural country to a booming economy, by taking advantage of the lack of environmental constraints (Poggio, Ruzzenenti, 2012).

Italy, unlike Nazi Germany, had witnessed an important Marxist-inspired movement of liberation. This gave rise after the Second World War to the strongest Communist party in the West, a party linked to Moscow, which, however, claimed its own autonomy: the Italian way to socialism, the new party (Spriano, 1975). A party that, unlike the other coeval parties, did not demand adherence to Marxism-Leninism, but to its own program and therefore left the debate between various Marxisms open, as in fact happened. (La Porta, Liguori, 2024).

The influence of the thought of Antonio Gramsci, perhaps the most original Marxist theorist in the West, which rightly found attention in the report just before us, was important.

In addition, alongside the Communist Party, a theoretical and cultural research inspired by a 'heretical communism' was to develop, which would have a significant expression, among others, in the magazine *Quaderni Piacentini* (Quaderni , 1962-1984).

A very strong workers' and trade union movement developed an effective initiative on working conditions and intervention for the rehabilitation of the environment within the factories according to a workers' model that placed participation and prevention central to the protection of workers. (Ruzzenenti, 2020; Citoni, Papa, 2017).

3. *The Italian ecomarxists*

The Italian *ecology*, under the banner of ecomarxism, grew in that very fertile context thanks to scientists, researchers and intellectuals willing to get involved and offer their contribution in that extraordinary season of change. Of the many protagonists we will offer but a limited account, for reasons of time, by reporting the significant traits of the thought of five of them: Virginio Bettini (1942-2020), Laura Conti (1921-1993), Giorgio Nebbia (1926-2019), Dario Paccino (1918-2005) e Carla Ravaioli (1923-2014).

Bettini became interested in ecological issues early on when he was just twenty years old. Ravaioli, as a Marxist feminist, acquainted with ecology in the early 1980s, while Nebbia, as a *commodities*

scientist[1] (Industrial Ecologist), had been interested in the relationship between the economy and natural resources since the 1950s. Conti's path, which began in the Liberation struggle, is marked by his profession as a medical hygienist and his focus on the influence of environmental factors on human health. Paccino, a former partisan, Marxist, involved in workers' struggles, came to ecology in the 1970s.

4. *A critical approach to science and technology*

The terrain on which they move is undoubtedly that of scientific research and technological innovations, but without any yielding to scientism, always anchored in the criticism of the supposed neutrality of science. Here Giorgio Nebbia:

> the assertion, which one sometimes hears repeated, that the failures produced by technology in the natural environment can be remedied by the use of other technology is not justified by an objective examination of the finite resources available on Earth, since the application of other technology can only result in a further subtraction of resources from the environment, in an endless spiral. This triumphalism seems to be inspired by the desire not to change, but rather to reinforce, the current patterns of material progress to achieve which the technical means are possessed by the advanced countries. Technological progress must therefore be carefully and critically evaluated on the basis of the effects it has on the environment.[2]

5. *A reading of Marx from an ecological point of view*

Our people have been good scholars of Marx's thought, with common original traits. The first consists in a clear distance from the 'Marxisms' dominant at the time, which considered technological and economic development an undisputed value, to be revived by profoundly changing production and class relations. Here Carla Ravaioli, before the fall of the wall, on the two systems in force:

[1] *Merceologo*, or a scholar of *merceologia,* an Italian academic discipline for which no translation or parallel exist in English (*warenkunde* in German), and which could be broadly associated with *Industrial Ecology.*

[2] Nebbia 1971a. Translation by the authors.

> On this basis, it is then a question of reviewing the reasons for rejecting the two dominant models of life. Both of which are unacceptable not because they are very different, but because, beyond the differences, they are actually very similar. Not because the West guarantees civil liberties within an insuperable class division, while in the East the dictatorship that abolished classes denies freedom; but because true freedom and even true justice are not possible wherever society revolves exclusively around the economic datum, wherever the productive categories are the primary referent of every collective and individual value, wherever the 'how much' [is] assumed as an alibi and substitute for the 'which' [...] The consumerism that, admittedly to a much lesser extent and in much less sophisticated ways than in the West so far, but certainly with just as much power of suggestion, is rapidly gaining ground even in the countries of 'real socialism', is proof of this.[3]

> Giorgio Nebbia focuses on the Economic-Philosophical Manuscripts. In this regard, he recalls, quoting a passage from the Manuscripts, that, faced with the political economy that governs and orients human needs in the service of capitalists' profit and gain, the young Marx identifies the solution in the communism as the positive suppression of private property understood as the self-estrangement of man, and thus as the real appropriation of the essence of man by man and for man; therefore as the return of man for himself, of man as a social being, that is, as a human being. This communism [...] is the true resolution of the antagonism between nature and man, between man and man, [...] between freedom and necessity, between the individual and the species [...]. The human essence of nature exists only for social man; for only here does nature exist for man as a bond with man, as the existence of him for the other and of the other for him, only here does it exist as the foundation of his own human existence [...]. Thus society is the essential unity, having reached its own fulfilment, of man with nature, the true resurrection of nature, the accomplished naturalism of man and the accomplished humanism of nature.[4]

Also worth mentioning is Laura Conti's focus on Marxist texts in What is Ecology, which cites some 'enlightening utterances', some of which have also been taken up by recent authors who have rediscovered the ecological side of Marx:[5]

[3] Ravaioli 1982a. Translation by the authors.
[4] Nebbia 1994. Translation by the authors.
[5] Saïto 2021.

> Capitalist production disturbs the organic exchange between man and earth, that is, the return to the earth of the constituent elements of the earth consumed by man [....] thus disturbs the eternal natural condition of a lasting fertility of the soil" (K. Marx, *Capital*, Book I, 2). Let us not flatter ourselves too much by our human victory over nature. Nature takes revenge for each of our victories. For every victory has, in the first instance, the consequences on which we had relied: but in the second and third instances it has quite different, unforeseen effects which often cancel out the first consequences in their turn.[...] The Italians in the Alpine region, in using on the southern slope the fir trees so jealously protected on the northern slope, did not at all realise that in so doing they were digging a grave for the sheep farming industry on their territory. [...] At every step we are reminded that we do not dominate nature as a conqueror dominates a subjugated foreign people, that we do not dominate it as a stranger to it, but that we belong to it flesh and blood and brain and live in its womb (F. Engels, *Dialectic of Na*ture).[6]

A final recurring theme is the interest in the debate between Malthus and Marx on the demographic issue in relation to the natural limits of the economy. Reading that confrontation, they do not let themselves, on the one hand, underestimating the problem of human population growth in relation to the limits and degradation of natural resources, which have worsened since Malthus' time, but, on the other hand, they maintain the point that the problem refers to the necessary overcoming of the profound inequalities between the privileged populations that enjoy abundance and waste and those that instead suffer hunger and destitution, which was one of the main arguments of Marx's criticism of Malthus.[7]

6. *Close relationship between ecological crisis and social crisis*

This is the common thread of the scientific research, elaborations, dissemination work and militancy of all five of them throughout their existence. Therefore, as ecologists, their interest in the labour movement remains central, with which they consider confrontation inescapable. Here Bettini, in 1976:

[6] Conti 1977.
[7] Conti 1988.

> The crisis: man versus man, not man and nature. If we go to the origins of any environmental problem we discover a fundamental reality: at the root of the crisis lies not the way man interacts with nature, but the way men interact with each other: that is, to solve environmental problems we must solve the problems of poverty, racial injustice and war. [...] There are many points of contact between the working class and those who deal with environmental problems. It is therefore right that the two experiences should be compared, because the environmental crisis in Italy, the US and the rest of the world cannot be solved unless we win the battle for acceptable working conditions, with adequate health interventions and the implementation of fair safety measures in factories. The problems of the environment and the problems of the working class therefore march hand in hand.[8]

7. *The complexity of the crisis: economy vs. ecology*

The critical issue is the relationship between economics and ecology, which somehow goes beyond the relationship between ecology and capitalism. Laura Conti is categorical about this:

> It is now widely believed, not only among socialists and communists, that political power must direct human activities, including economic activities, in such a way that no poisonous substances are put into circulation, in such a way that water and air can be used not only by industry but also by agriculture, and indeed not only in productive activities but also for sport and entertainment, and finally in such a way that future generations do not have to reproach us for our selfishness. Healthiness, compatibility, durability. When we say that "this must be taken care of by political power", we mean that economic power is not capable of doing so: that – to a first approximation – the economy is in itself antithetical to ecology, that economic mechanisms drive the deterioration of the human-environment relationship in the three aspects we have identified; and that therefore extra-economic intervention is needed to correct this drive. What is needed is a conscious and deliberate, i.e. political, intervention to correct what is not conscious, not deliberate, i.e. "mechanism" in the economy.[9]

[8] Bettini, Commoner 1976. Translation by the authors.
[9] Conti 1977b.

Giorgio Nebbia, as a commodity ecologist, dedicated thirty years of his scientific research at the University of Bari to this crucial issue, starting in 1972, when he had a course in ecology instituted in the Faculty of Economics at that university, the first in Italy, taking this science away from the field of biology, and the distorted use that many had done of it for decades, and integrating it into the human sciences. And it was precisely in order to illustrate ecological laws to economists that the course was instituted, as he explained in the 1972 lecture written to support its necessity. Here, Nebbia outlined his future course of research, the environmental accounting of economics, based on a quantitative and qualitative analysis of the biophysical metabolism of goods, the input of matter and energy from nature, and the output in degraded and polluting form back to nature. This is the only condition for seriously and knowledgeably tackling the ecological crisis. What the economy could not do because of its exclusively monetary basis, i.e. an artificial convention that is completely blind to the material processes of the human economy in relation to the ecology of nature, that intrinsic limit that Laura Conti called the 'mechanism' of the economy. Giorgio Nebbia's research would finally culminate, in the early years of the new century, with a complete accounting of the intersectoral matrix of material flows in the economy, with 36 rows and columns – one of the first such endeavors in the World, and the calculation of the gross material domestic product for Italy, PIML, for the year 2000.[10]

Carla Ravaioli also took the structural and, if we want, epistemological limit of economics by the horns, and with extraordinary persistence returned to the subject with an operation unique in national journalism and beyond. She decided to pose directly the questions that had been floating in her head for some time to the most quoted economists in the world, belonging to the most diverse schools. Thus, in 1992, she published the result of this work, *The Planet of Economists, or the Economy Against the Planet*, a title that leaves no margin for possible misunderstandings: it is the economy, in all its variants, the woodworm that is undermining the earth and the humanity that is hosted there. And the interlocutors, twenty-eight in total, including Nobel Prize winners, come from the most

[10] Ruzzenenti 2022.

diverse parts of the world, from the USA to Russia; Let us cite some well-known names as an example: Milton Friedman, the founder of pure neoliberalism, John K. Galbraith, a neo-Keynesian, Nicolas Georgescu-Roegen, a theoretician of bioeconomics, Juan Martinez-Alier, a theoretician of ecological economics, and James O'Connor, a theoretician of eco-Marxism. An essential text for anyone who wants to delve deeper into the dichotomy between economics and ecology (Ravaioli, 1992, 1995).

8. *Ecology and capitalism*

As we have seen, for a true ecological conversion it is not enough to go beyond capitalism, even if this remains a fundamental knot to be untied. Laura Conti posed the question in *What is Ecology*:

> We are therefore approaching the heart of the problem: whether it is possible to save the vital balance of the planet, or at least begin effective action in this direction, already within the capitalist system, or whether the capitalist system will lead us to ecological catastrophe before disintegrating. Here, from a different angle, many of the traditional problems of Marxist thought, of the workers' movement, are proposed again: but on new ground, in which there is a little less space for hypotheses and a little more space for certainties.[11]

Of great interest on "certainties" is the dialogue that developed in the early Seventies between Giorgio Nebbia and Dario Paccino. Dario Paccino, a militant Marxist, journalist and essayist, was publishing his most important text, *L'imbroglio ecologico* (*The Ecological Deception*), a text that, as is known, schematically supported the priority need to overthrow the capitalist system if you did not want to reduce ecological discourse, even by those with radical positions like Nebbia's, to an inconclusive "deception". It is interesting, however, to see the very frank and at the same time cordial and mutually respectful dialogue that took place between the two, which we only report here for reasons of time.[12]

[11] Conti 1977c. Translation by the authors.
[12] Paccino 1972; Piccioni 2020.

9. *Necessary Degrowth*

Already in 1971, Giorgio Nebbia, in view of his participation in the UN Conference in Stockholm representing the Vatican, with the essay, previously cited, *For a Christian Vision of Ecology*, had addressed all the issues on the table today with lucidity of analysis and farsightedness of proposals, including that of the limits of growth and "degrowth": "… it is essential to impose on countries that already have a lot a critical review of the hierarchy of needs for material goods and an action of discipline in consumption and a brake on the exploitation of natural resources. Various parties are thinking of possibly reducing the rate of growth of production at a global level to zero, which requires an operation of de-development of the rich countries to allow the poor countries to reach an adequate level of development". Therefore "de-development", or degrowth.[13]

In 1982, Carla Ravaioli tackled the ecological issue, focusing immediately on the thorniest, if not unspeakable, issue: the unacceptability of the infinite growth paradigm: The end of endless growth is the eloquent title of the last chapter of her *Il quanto e il quale*:

> And in fact, endless development, a model of the capitalist economy, while it pushes consumption to the point of waste in the countries with advanced industrialization, does not in any way guarantee a production capable of alleviating the shortages of the underdeveloped countries, still below the possibility of satisfying primary needs, but rather works hard to introduce the consumerist model, the ideology of the superfluous and its mystifying hedonism even in these starving societies. Conversely, an economy based on the reduction of production would first of all involve a reversal of the trend, blocking a production that produces needs to the extent of its own growth, in fact reversing the current relationship between needs and consumption, and therefore between supply and demand: not by abolishing the market, but by subverting its current rules. [..] It is worth remembering, however, that the accumulation of gigantic quantities of weapons with extremely high destructive potential not only belongs with perfect coherence to the model of endless growth, but [...] represents its necessary consequence: war – today, that is, the destruction of humanity – is the natural complement of the current form of production.[14]

[13] Nebbia 1971b.
[14] Ravaioli 1982b. Translation by the authors.

10. *Current relevance and international resonance of Italian eco-Marxism*

The workers' model of intervention on work environments had recognition and "imitators" in Europe and abroad, in particular in Japan and in the Brazilian Cut union (Siciliano, 2006; Cut , 2008).

For his innovative and pioneering research on the metabolism of the economy, or on the inputs of matter and energy coming in from nature and on the outputs coming out, in a degraded and polluting form, returning to nature, Nebbia is still studied today in the world by those who deal with environmental and mass flow accounting in the field of *ecological economics* (Ruzzenenti F., 2023).

The very important and still precious investigative work by Carla Ravaioli, The Planet of Economists, or the Economy Against the Planet, deserved to be published by one of the most prestigious publishing houses in international level, Zed Books in London.

Barry Commoner, encouraged by the young Virginio Bettini who introduced him to us, adopted Italy and the environmentalism of the Italian left and especially the communists as his second homeland, which he felt was particularly in tune with his positions (Paolini, Sanna, 2025).

Giovanna Ricoveri, who also trained at the IUAV University of Venice, founded the magazine *Capitalismo Natura Socialismo* in 1991 as part of an international network of political ecology magazines: *Capitalism Nature Socialism*, directed by James O'Connor in the USA, *Ecologia politica* directed by Juan Martinez-Alier in Spain and *Ecologie Politique* directed by Jean-Paul Deléage in France (Biografy, 2024).

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The environment between use and exchange values: ecosocialist proposals inspired by Graeco-Roman Antiquity and Karl Marx

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Abstract

Through the cult rendered to the neoliberal dogma of a « growth » based on purely market and finance criteria, the environment of the human communities has been submitted to productivism and extractivism, with the social and ecological destructive consequences we know. A critical parcourse through Graeco-Roman Antiquity allow us to rethink the fundamental interactions between the human beings and an environment they are an integral part of. Particularly the distinction made by Marx between use value and exchange value invites us to propose other criteria to a growth which has to be thought in terms of social justice and of ecological balance in an ecosocialist perspective.

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Keywords: Anthropopoiesis, capitalism, ecopoiesis, ecosocialism, use/exchange value

1. *Anthropocene: the "Ecopoiesis" Paradigm for Women and Men*

Wherever we place the beginning of this process, it is now clear that our modern societies, dominated by industrialisation and technologies, along with the financial profits that can be derived from them, have entered a new period. It is referred to, rightly or wrongly, as the Anthropocene, or even the Capitalocene[1]. The practical and technical interaction of humans with their environment is now so extensive that it is endangering the milieu that is indispensable for life for every human community. However, aside from any ontology – whether anthropological or not – and aside from any classification of geological ages, I propose to use the concept of "ecopoiesis" to describe this new paradigm. Indeed, in addition to the impact on the environment and, ultimately, on the climate of the mechanistic techniques and technologies that have enabled industrialisation, we must also consider processes such as the genetic manipulation of organisms facilitated by the life sciences. These manipulations concern plants and animals as well as humans; they affect both humans and their milieu, and, more globally, the biosphere, while, in the capitalist regime, multinational pharmaceutical and agri-food industries derive enormous profits from those processes.

2. *Life sciences: bioeconomy and neuroeconomy*

However, we must move from this techno-capitalist "ecopoiesis" to a concept of "anthropopoietic ecopoiesis", not for reasons of Hellenistic erudition but so as to integrate the social and cultural dimension of the interaction between humans and their milieu.[2] "Anthro-

[1] On the history of both the concepts, see Bonneuil, Fressoz 2016, pp. 17-62 and 247-280.

[2] The concept of "ecopoiesis" is a tribute to the work of Augustin Berque, who defines the "ecumene" as "the ecological, technical, and symbolic relationship of humanity to the expanse of the earth" (2010, p. 17); however, by pure coincidence it is also found in the title of the journal *Ecopoiesis: Eco-Human Theory and Practice*, founded in Russia in 2020, whose aim is to offer "a vibrant forum of theories and practices aimed at harmonizing the relations of mankind and the natural world in the interests of sustainable development, the creation of Eco-Humanity as a new community of human beings and more-than-human world"; https://en.ecopoiesis.ru/manifesto. For the concept of "anthropopoiesis", see the different studies published by Affergan, Borutti, Calame, Fabietti, Kilani, Remotti 2003.

popoietic ecopoiesis" refers to the not only technical, but also social and cultural construction of the human, of every man and woman in relation to its environment and in interaction with it. The concept is intended both to avoid the new form of naturalism, or even behaviourism, that is often produced by the cognitive sciences, and to adopt an explicit attitude of anthropological and political criticism in relation to our current mode of existence in what is identified as the Anthropocene, if not the Capitalocene.

In an age marked by the prevalence of "ecopoiesis", the life sciences and the neural sciences are showing the constitutive permeability of orders that were previously considered distinct – the physical, the vegetal, the animal, and the human – for better or for worse. Across the fields of physics, chemistry, biology, and the human sciences, these orders are now integrated into an extremely complex interactive system: a complex system that is not so much a product of complex thought, but rather a product of a way of thinking about complexity. This is a way of thinking that is capable of taking into account systems that, like non-linear dynamic systems, are interconnected at different levels of organisation; they include phenomena of self-organisation, emergence, bifurcations, multiple causalities (linear or circular), non-linear interactions, noise or chaos phenomena, etc.[3]

The representatives of the life sciences now recognise this state of affairs: not only are the biological or neuronal processes they have identified, such as the development of cells or the functioning of synapses, subject to a multi-determinism that is not necessarily linear; but cellular developments and neuronal processes also depend on complex interactions both with the organic environment and with the social and cultural context of their actualisation; and this is without taking into account the element of randomness which, as in the case of genetics, marks their deployment. Thus, at the turn of the twenty first century, in contrast to the destructive impact on the environment and the climate of the use of the mechanistic technologies that enabled industrialisation subject to capitalist productivism and the market (or alternatively subject to Soviet-style centralised planning and productivism), the decisive advances of the life sciences and

[3] For a recent formulation of these ideas, see Guespin-Michel 2015, pp. 18-29 and 46-59. See also some figures on this from Testart, Sinai, Bourgain 2010, pp. 102-104.

the neural sciences also appeared. Both of these have fundamentally called into question the relationship of humans, with their social and cultural practices, with a nature wrongly objectified as a set of resources to be exploited.

However, as the life sciences are now developing mainly in the context of the Anglo-American neoliberal regime, they are particularly solicited with a view to the financial profit that can be extracted from their various developments and applications. This is the case, for example, with the genetic manipulation of living organisms, whether this concerns plants, animals, or humans. These practices depend on biological and biotechnological knowledge which is largely exploited and monopolised by the commercial logic of certain large multinationals that, in the agro-chemical and pharmaco-medical fields, control a purely economic globalisation through the use of patents. Under the pretext of making a generous and progressive contribution to the food and health of the human race, such companies implicitly share Descartes's conception of the domination of nature by humans! The hegemonic spread of GMOs and the launch of numerous gene therapies are thus contributing to a new productivism. Indeed, as potential *ophelémata* in the Promethean sense of technical practices offering an advantage to humans[4], gene technologies applied to plants or humans are monopolised by agri-food and pharmaceutical transnationals, under the control of the sacrosanct patents that protect "intellectual property".[5] In this way, these conglomerates, specialists in "tax optimisation", maintain a monopoly, while restricting both organic agriculture centred on basic food crops and the spread of low-cost generic products for treating endemic and epidemic diseases. We should recall here that it took more than two years for the pharmaceutical companies involved to grant a very limited waiver of the intellectual property concerning vaccines against Covid-19…

Thus, in their use of technosciences, the large agri-food and chemical groups are taking possession of discoveries, transformed into inventions, while stripping them of the principle of civil utility that was central to the Promethean (and also Cartesian) concept of technical arts. Powerful transnational companies such as Monsanto or Syngenta, in the fields of agri-food and agrochemicals, are removing from

[4] Aeschylus, *Prometheus Bound*.

[5] See the examples given in the book published by ATTAC 2012, pp. 54-56.

biotechnologies their possible social utility in order to submit them exclusively to the demands of capitalist profit and monopolies. Aside from their possible negative effects on human health and soil quality, the spread of GMOs contributes, for example, to the impoverishment of small farmers who are forced to go into debt each year to buy new seeds and are led to abandon local food crops.[6]

> […] It has also been shown that the paradigm shift associated with the new form of individualism characteristic of the neoliberal economy has led to the failure of the medical project of setting up banks (*sic*) of genetic data. The clinical use of the DNA sequences collected in national biobanks, driven by the hope of making substantial profits, has proved to be unreliable, to say the least, partly because several genes may be involved in the onset of a disease, partly because of the epigenetic factors mentioned above, and partly because of the influence of individual contexts.[7] And new neurotechnologies seem to be confronted with the same difficulties in terms of ensuring that their use is safe for humans and socially sustainable. We should be particularly wary of the promises of economic efficiency made by actors in the fields of bioeconomy and neuroeconomy, based on basic behaviourism and a logic of financial gain…[8]

3. *"Anthropopoietic ecopoiesis"*

The concept of anthropopoietic ecopoiesis therefore allows us not only to avoid ontologies and designations of a geological nature, but also, and especially, to call out the illusions of so-called "sustainable development" or the "green economy": these are nothing more than the ecological alibis – the "greenwash" – of a way of thinking that is attached to productivist growth, centred on increasing GDP, and the principles of competition and competitiveness (in a race to the bottom with regard to wages and taxation). By claiming to establish property rights over the resources of "nature", by appropriating the major ecological functions of the planet and subjecting them to a system of exchange value, the green economy merely constitutes the biosphere as a vast private enterprise. Thus, by constituting nature as

[6] See the essay published by ATTAC 2005. See also Testart, Sinai, Bourgain 2010, pp. 102-110.

[7] Rose, Rose 2012, pp. 158-216.

[8] See the excellent chapter on this subject in Azam 2015, pp. 165-209.

a stock of resources and drawing on various entrepreneurial strategies, the neoliberal advocates of the green economy intend to subject the earth itself to financial investment and the "laws" of the market, and consequently to capitalist profit.[9] Their credo of "green growth" turns out to be a pure "mirage".[10]

Once again, through a process of generalised commodification, we find the domination of the planet and the biosphere, for economic and financial profit, by a tiny minority of financially powerful individuals, and to the advantage of transnational companies owned by super-rich oligarchs. In contrast, we therefore propose an anthropopoietic "ecopoiesis", involving the construction of men and women alike in an emancipated culture of solidarity, and an interactive construction in relation to their biological and social living milieu. This "ecopoiesis", both political and social in nature, is an ecosocialist "ecopoiesis" aimed at addressing the inevitable and necessary, but highly complex interaction between humans and their environment, between human communities and their milieux, between the basic material and social needs of humans and the means of balanced satisfaction provided by their environment.

Indeed, the ecological and ecopoietic imperative is not only of an epistemological order, but also economic and, ultimately, political. Faced with the productivism imposed by the capitalist economy and the generalised commodification of relations of production and social and human relations, but also faced with the pretensions of a sustainable or green economy that remains fundamentally attached to the principles of the market as the ultimate regulating authority, the only viable option is a radical break.[11] In this ecosocialist transformation, the relations of production and the productive apparatus

[9] ATTAC 2012, pp. 79-126; see also the critique of green capitalism by Tanuro 2020, pp. 93-123.

[10] I am here paraphrasing the title of the chapter that Kempf 2009, pp. 75-108, devotes to the modes of energy production and consumption involved in globalised capitalism in order to show that "the technological choice is essentially a political choice that derives from a prior conception of social organisation" (p. 108).

[11] The effects of capitalist economic logic and "market fundamentalism" on the environment, and in particular the climate, are well described by Naomi Klein in her best-selling essay (2015a), but she does not draw out the inevitable consequences for a necessary break with a destructive capitalist system and for the institution of a new form of socialism. On the domination over "nature" imposed by capitalism, see in particular Kovel 2007, pp. 51-94.

themselves would be rethought according to the social and environmental requirements imposed by a break from the double exploitation of humans and the earth; a break from the sole guiding principle of material accumulation and financial profit, driven by the cult of the commodity and by compulsive consumption, and facilitated by invasive advertising;[12] a break from the enslavement of knowledge to the sole objective of developing new technologies marked by the need for constant innovation and the competitive creation of new consumer needs.

This means that the ecopoietic ecological transition does not only entail a democratically planned economy that is managed at several different levels, according to criteria that are both social and environmental, and that respect both biodiversity and the diversity of human cultures. As an anthropopoietic transition, it also requires a new conception of the human: another anthropology than the one that pervades Anglo-American, and now globalised and libertarian neoliberalism, with its focus on individuals in competition with their peers for the selfish development of their own potential and capacities, exercising an individual and material freedom aimed at personal profit alone, which in reality hinders and limits the freedom of the majority of other human beings; an anthropology based on the principles of proximity and solidarity, in an anthropopoietic and ecopoietic sense…

4. *Marx: from Exchange Value to Use Value*

The concept of the technical arts, whose invention Aeschylus attributes to Prometheus, as useful practices (*ophelémata*) for the civilisation of humans, therefore invites us to return, in a context of capitalist modernity, to one of the founding principles of Marxist economic analysis, namely the distinction between exchange value and use value.

[12] See, for example, the proposals formulated by Löwy 2020, pp. 113-119 and 165-177; see also Kovel, Löwy 2001, in an "ecosocialist manifesto", and Kovel 2007, pp. 265-279. It should be noted that the ecopoietic and ecosocialist imperative goes far beyond the social ecology and "communalist" project imagined in the Anglo-American context, in the libertarian movement, which aims at a new municipal rationality and a new ecological humanism: see Bookchin 2006, pp. 70-71 and 97-110, with particular reference to Aristotle.

5. *From Aristotle to Marx*

It is worth recalling that this distinction has its origin in an often forgotten passage of Aristotle's *Politics*.[13] Using the example of a shoe, which can be either worn or exchanged, Aristotle draws a distinction between two arts of acquisition (*tékhne ktetikḗ*): the technical art that underpins the domestic economy, and that which corresponds to an art of accumulating possessions (*khrematistikḗ*). The former, which relates in particular to agricultural management, involves "the production and storage of the goods necessary and useful for the community life of a city or a family";[14] such a practice of acquisition, which is intended to provide for a "good life" (*agathè zoé*), is limited in its scope. On the contrary, the art of acquisition aimed at the accumulation of goods is unbounded; it is driven by the sole desire to live, and "as such a desire is limitless, one desires an unlimited number of products to satisfy it".[15] Thus, while exchange may be indispensable insofar as humans, "by nature" (*katà phúsin*!), do not all possess what is necessary, when it is extended to the scale of communities it should be maintained within the limits of a "natural" (*katà phúsin*, once again) autarky; according to this principle, useful things are exchanged for other useful things, and nothing more. The possible combination of that which resembles use value and that which corresponds to exchange value is thus subject to the Promethean criterion of social utility, or civilising utility; and this utilitarian criterion is intended to respond to the needs created by certain deficiencies inherent in the human condition.

Thus, in the first chapter of the first section of the first book of *Capital*, Karl Marx bases his economic reflection on the production of commodities.[16] He defines exchange value as a quantitative relationship that, by means of money, makes the respective use values of the different products of human labour interchangeable. While representing the labour time socially necessary for their production, commodities correspond fundamentally, from the point of view of their use, to a means of subsistence. It is obviously the substitution of exchange value for use value and the exploitation of the labour necessary for the

[13] Aristotle, *Politics* 9, 1256b 40-1258a 19.

[14] 1256b 28-30; see the commentary by Cozzo 2021, pp. 98-105, with the numerous bibliographical details given in note 15.

[15] 1258a 1-3.

[16] Marx 1976, pp. 125-131.

production of commodities that makes capitalist accumulation possible. In short, this development corresponds to Aristotle's account of the desire for unlimited hoarding. Let us recall that, while the material and social conditions of the fourth century incited Aristotle to formulate an opposition between the exchange of goods on the basis of social utility and their appropriation and unlimited accumulation by a minority, he lived in a society in which the majority of productive work was performed by slaves. It was probably this fact, combined with the absence of industrial technological production, that prevented him from developing a theory of the double art of acquisition in terms of the tensions between labour and capital!

Nevertheless, Marx's economic theory is dependent on an objectification of nature common to all Western thought in the nineteenth century. Human domination over the forces of nature and the development of humans' own productive forces are the two major themes that mark his critique of capitalism and the foundations of communism. Marx's confidence that further material progress was still to be expected from the industrial revolution, based on the undeniable technical benefits that industrialisation had already brought, did not prevent him from foreseeing the limits and possible destructive consequences of the development of those "productive forces".

As a result of a certain restrictive interpretation of what "material activity" is, one of the foundations of Marxist thought has been transformed into a dogma: "The production of ideas, of conceptions, of consciousness, is at first directly interwoven with the material activity and the material intercourse of men – the language of real life".[17] It is therefore infrastructures that determine superstructures. And at the other end of the causal chain based on human labour, the development of productive forces has as its corollary the domination of nature. This is particularly the case in capitalist agriculture, where all progress "is a progress in the art, not only of robbing the worker, but of robbing the soil […]. Capitalist production, therefore, only develops the techniques and the degree of combination of the social process of production by simultaneously undermining the original sources of all wealth – the soil and the worker".[18] Thus, particularly

[17] Marx, Engels 1998, p. 42.

[18] Marx 1976, p. 638. On the "metabolic rift" or "shift" by Marx see the numerous and relevant works by Foster from 1999 to 2024, and Saito 2024, pp. 23-34 ; I will come back to the question in a further study.

in the field of agriculture, capitalist accumulation, with the substitution of exchange value for use value, and the imperative to of constantly increase the former, ends up exhausting and destroying both the workers and their milieu.[19] But Marx did not foresee what would eventually happen under real socialism…

6. *An ecosocialist commitment*

In fact, in order to increase and maximise profits, the exploitation of natural resources is coupled with the exploitation of what are considered, significantly, as mere "human resources". Through relentless extractivism and productive activities that depend almost exclusively on the consumption of hydrocarbons, globalised productivist capitalism has implicitly succeeded in breaking down the artificial barriers between humans and their environment, between culture and nature, but only to destroy both. However, as early as the final report to the Club of Rome in 1972, it became clear that the pollution and other harms inflicted on the environment were due not to demographic growth, but above all to economic growth based on profit, coupled with and accentuated by neo-colonial globalisation, particularly concerning material production. The wave of privatisations that resulted from the spread of neoliberal ideology, first in the Anglo-American sphere from the early 1980s onwards, only accelerated that movement.[20]

We now know the harmful impact on the climate and on human health in particular of unbridled production and the consumption of non-renewable fossil fuels; anarchic production and compulsive consumption centred on the exploitation of coal, hydrocarbons, bituminous sands, or shale gas, in a pure logic of financial profit and capitalist accumulation. We know that, even in the case of digital

[19] Marx 1876, I part 7, chap. 24 and I part 4, chap. 15, for citations. These texts have been intelligently commented in Corcuff 2012, pp. 99-120; see also Löwy 2020, pp. 69-86, as well as, from an eco-feminist perspective, Salleh 2017. The social and ecological crisis of neoliberal capitalism invites us to revisit the notion of "value": see the proposals made on this subject by Harribey 2013, pp. 91-142, and 2020. From a perspective of economic anthropology, relating to gifts-countergifts and accumulation, see Godelier 2010, pp. 75-99.

[20] The different stages of this dual movement combining neocolonialism and neoliberalism have recently been clearly traced by Stanziani 2021, pp. 211-235 and 239-273.

information and communication technologies, the operation of servers and data centres consumes more than 2% of the world's energy (generally of fossil origin), not to mention the consumption of the computers themselves, the enormous energy cost of streaming, and the polluting waste resulting from devices that are deliberately made to become obsolete after a short period of use.

Consequently, an ecosocialist commitment to social and ecological equity on an anthropopoietic and ecopoietic basis calls for a series of breaks with previous practices:

– a break with the capitalist market economy based on the principles of "free and undistorted" competition and competitiveness, which, as we have seen, leads to the prevalence of exchange value over use value;

– a break with the imperative for unlimited growth measured in particular in quantitative terms of GDP according to the criteria of added value in the goods and services produced;

– a break with a productivism centred on financial profit and involving extractivism, energy waste, various forms of environmental and biosphere pollution, slave-like working conditions, and consumer addiction;

– a break with a globalisation that is subject, through free trade treaties, to the rules of the market and capitalist profit, as well as to the domination of multinationals;

– a break with the neocolonial economic and political domination of rich countries over poorer populations and their environments;

– a break with the ideology of (neo-)liberalism based on individual development and on the generalised commodification not only of human relations, leading in particular to new forms of exclusion and racism, but also of human milieux, which has already caused so much environmental destruction.[21]

The fact remains that the material production of goods has been and still is indispensable for the physiological survival, as well as for the anthropopoietic and ecopoietic construction of human communities. It is therefore now necessary to think about the economic practices of humans in relation to their living milieu, as well as the knowledge that guides them, not in terms of "degrowth", but in terms

[21] For a presentation of the concrete actions that these different breaks require, I refer to my 2020 and 2020-21 studies, and to the various references listed there.

of another kind of growth, an "alter-growth" or, better still, another kind of development. While growth is absolutely necessary in all the countries that have been impoverished by the economic and financial hegemony of the richest nations in relations of neocolonial domination, it must not be based solely on the criterion of increasing GDP.[22] In contrast, a new definition of work should be established which extend beyond the production of goods to include services, including personal care, in ways that would ensure full employment under conditions of social and global justice and environmental protection. On the other hand, economic production itself should undergo an industrial reconversion and be subjected to forms of decentralised planning, through the socialisation of large-scale private property – with relations to the environment redefined according to ecological and social criteria.

In such a genuinely anthropopoietic perspective, techniques and technologies, which undoubtedly contribute to ensuring the material basis of human social and cultural emancipation, must be reorientated and reframed, in their inventions and in their uses; and furthermore, this must be done on the base of an anthropopoietic and ecopoietic conception of the basic needs of humans in interaction with their environment. Clearly, only the satisfaction of these immediate material needs concerning food, housing, health, education, and communication can ensure, in a way that grants dignity and peaceful autonomy to each and every person, a social and cultural construction of humans in complex communities, in interactive relation to the living milieux that they inevitably modify, but without degrading or destroying them.

[22] For a positive critique of the concept of degrowth, see in particular Lavignotte 2009, pp. 53-80, although a new movement centred around the concept of degrowth has more recently been proposed, with different modalities, by Parrique 2022; see also, in an ecosocialist perspective, Löwy 2024.

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Living the Pyrocene
Rethinking the human-fire relationship towards coexistence

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Abstract

This paper analyzes the phenomenon of wildfire. The need to shift from the traditional view of wildfire as natural disasters to a human influenced phenomenon, within the "Pyrocene" era, is discussed. The authors analyze the traditional approach of fire exclusion, mainly based on fast suppression, highlighting the "fire paradox", i.e. the negative effects of wildfire systematic suppression that leads to the fuel accumulation, making further fires more intense and catastrophic. The Socio-Ecological Systems (SES) was discussed to explore the interconnections between environmental dynamics (such as climate change) and social-economical transformations. A particular focus was dedicated to the Mediterranean context, in particular to Tuscany, where the abandonment of traditional agro-silvo-pastoral activities and rural depopulation have altered the landscape, increasing the vulnerability of these areas to wildfire. The author suggests moving to "Integrated Fire Management" that includes prevention, education, and finally emergency management. The importance of involving local communities (for example, through Firewise initiatives) to build collective resilience, recover a "culture of fire," and move from a strategy of dominance to one of conscious coexistence has been stressed in this paper.

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Keywords: Wildfire, Socio-ecological systems, Governance, Pyrocene, Adapted community

1. *Fire, wildfire, and forests*

Wildfires are natural phenomena of fire spreading through vegetation. They can occur in forests, grasslands, peatlands, wetlands, agricultural areas, or urban-forest interface zones. Where present, any human-made structures and infrastructures within the fire propagation area are also considered[1]. Fire has probably existed on Earth since the first appearances of terrestrial plants (more than 400 million years ago) and has shaped ecosystems. The history of fire is intertwined with the history of life on Earth[2]. Wildfires represent a complex phenomenon from the chemical, physical, and sociological points of view, deeply rooted in the historical relationship between humans and fire. Humans have significantly influenced the change of fire regimes over time, putting both their communities and the biodiversity of some areas at risk.

There is fire, wildfire, traditional or natural fire, prescribed and controlled fire[3]. The absence of human control and the susceptibility of fire propagation allow distinguishing the wildfire phenomenon from the use of fire. Wildfire represents a natural phenomenon, even

[1] Pyne 2022.
[2] Pausas, Keeley 2009.
[3] Delogu 2013; FAO 1986.

though in most cases human caused, with the potential to endanger the safety of people or entire ecosystems. Wildfire can be defined as a disturbance, just as rain can be defined as a disturbance[1]. In Mediterranean ecosystems, i.e. fire adapted ecosystems, wildfires have a significantly lower impact on ecosystems and biodiversity compared to urban planning or modern agriculture, which irreversibly modify the rural environment[4].

The environmental factors determining fire behavior, as summarized by Pyne and Cronon (1997), are: meteorology, vegetation, and topography. Topography affects fire behavior: slopes and valleys promote fire spread[5]. Vegetation type, structure, and condition determine fire spread dynamics. Many Mediterranean species (e.g., Pinus spp., Erica spp., Genista spp. and Ulex, Quercus ilex, Quercus suber, etc.) are adapted to fire, showing enhancement, resistance, or resilience mechanisms (e.g., spotting, thick and resistant bark of Q. suber, pine serotiny, resprouting ability of Erica spp., Ulex spp.). The absence of natural herbivore activities increases flammability[6]. Globalization and "invasive species" alter fuel properties[7]. Abandonment of forested areas further promotes fire spread through fuel accumulation. Fuel can be managed through interventions (e.g., firebreaks, pasture opening, prescribed fires, species replacement) or broader strategies (e.g., use of forest resources, repopulation of inner areas, establishment of fire management communities). Climate change transforms the fire regime into events exceeding extinction capacity[8]. Drought and high temperatures reduce biomass moisture; rainy periods increase fuel. Wind and gusts promote fire spread. CO2 rise enhances photosynthesis and biomass accumulation[4,6]. Fire ignition can be either natural or anthropogenic. Natural ignitions (lightning, volcanic activity) are rare; anthropogenic ones dominate in the Mediterranean. Population growth increases ignition likelihood, but large wildfires require specific climatic conditions and land-use combinations[4].

According to the scale of reference, various fire triangles have been designed (Figure 1). However, it is equally important to consider socio-economic factors that influence the wildfire phenomenon.

[4] Pausas 2012.
[5] Keeley et al. 2011.
[6] Scott et al. 2014.
[7] Young et al. 2006.
[8] Archibald et al. 2013; Fernandes et al. 2020; Tedim et al. 2020.

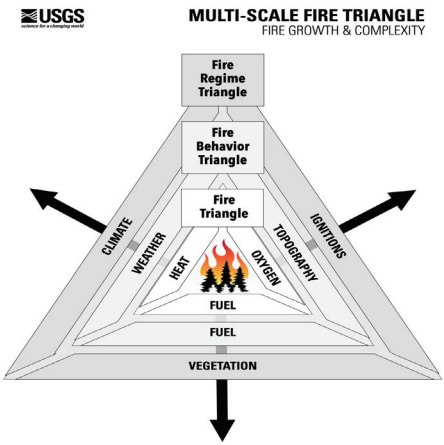

Figure 1. The multi-scale fire triangle (USGS, https://www.usgs.gov/media/images/multi-scale-fire-triangle-fire-growth-and-complexity-simplified [Accessed 16th October 2025])

2. *The Pyrocene*

The use of fire by early hominins started a profound and lasting human-fire relationship[9]. Fire allowed human control over light, heat, and food, and was used for social and ritual purposes. The fire's geography and behavior reshaping led to a "second fire", analogous to Cicero's concept of second nature. The Enlightenment reframed fire as a tool of power, leading the second wave of global colonialism, supporting fossil fuel extraction and industrial growth[1,10]. Forest corporations focused on suppression, while the convergence of imperialism, colonialism, and industrialization changed the land-use under the pretext of nature "conservation"[6]. Fire was considered esoteric and primitive, while fossil fuels represented progress and social order. As the latter replaced wood, fire became a means to dominate landscapes (and nature), as well as an hazard[1]. Industrialization in Europe marginalized direct flame, leading to a virtual "third fire"[1]. Fire was stigmatized and excluded from daily life, thus contributing to changes in wildfire risk

[9] Bowman et al. 2011.
[10] Mercer, Simpson 2023.

perceptions[6], as well as in biodiversity loss. This transformation led to fuel accumulation, driving climate change, ocean acidification, and glacier melting[1]. Nonetheless, anthropogenic climate change alters fire regimes[6,11,12]. Recognition of these issues in the 1960s led to Fire Ecology, a discipline examining interactions among fire, living organisms, and abiotic environments. Fire acts as a mechanism to reactivate energy cycles, recycle organic matter, and sustain biodiversity[3].

Fire suppression strategies can increase fuel accumulation: this phenomenon is called the "fire paradox"[3,1,6] and highlights the ecological consequences of capitalist social organization[13] . Integrated management of flammable landscapes combines prevention, emergency response, and post-fire interventions, thus connecting fire ecology, fire culture, and active management strategies[14] (Figure 2). A holistic approach is essential under global change, combining indigenous knowledge, scientific expertise, historical practices, and fire education[3,15].



Figure 2. The fire integrated management triangle, combining culture, management and ecology.

[11] Moritz et al. 2014.
[12] Westerling et al. 2006; 2011.
[13] Moore 2015; 2017. O'Lear et al. 2022.
[14] Oliveras Menor et al. 2025.
[15] Buizer, Kurz 2016.

Prescribed fire is a key tool, though its regulation reflects a metabolic rift between human societies and nature[16]. Repressive laws often ignore fire's ecological role[17]. When effectively applied, it prevents large-scale fires, restores legitimacy to local knowledge, and enables a repoliticization of fire management[6,15,18].

Pyne (2022) frames the Anthropocene as the "Pyrocene," the era dominated by human manipulation of fire, encompassing first, second, and third fires. Adaptation entails accepting that fire will persist and focusing on wildfires and fire regimes rather than fire itself. Strategies include promoting the second fire, reducing the third, and balancing approaches: self-regulation, prescribed fire, fuel management, and suppression. Policy decisions are most effective when locally informed[19].

Pyne (2022) states: "We have created a Pyrocene. Now we must live in it."

3. *Socio-ecology of wildfires*

Wildfires transcend the notion of natural disasters and are better understood as processes embedded within socio-ecological systems (SES), where social dynamics (historical land-use models, economics, politics, social processes) and ecological dynamics (climate, meteorology, topography, vegetation) co-evolve[20]. SES are nested, multilevel systems delivering essential societal benefits – food, fiber, energy, water – through interactions between governance structures and resource users[21]. Extraction and maintenance processes represent the mechanisms through which cooperation and collective management dynamics manifest[22].

Wildfires are coupled systems between human (culture) and nature[23], whose behavior emerges from the interplay between physical drivers – climate, vegetation, topography – and social variables such as

16 O'Connor 1998.
17 Alcasena et al. 2018; Bovio et al. 2017.
18 Pais et al. 2023.
19 Roos et al. 2016; Toman et al. 2012; Uyttewaal et al. 2023.
20 Calkin et al. 2015; Fischer et al. 2016; Steelman 2016.
21 Gallopín 1991; Raufflet 2000; Scholz 2011.
22 McGinnis et al., 2012; Ostrom 2009.
23 Spies et al. 2014.

land-use change, rural depopulation, and shifting perceptions of risk. In the Mediterranean, social and ecological subsystems are deeply interwoven[24], demanding wildfire and forest management frameworks that promote coexistence with fire[25].

Land-use transformations and technological shifts are central social dynamics. Since the Industrial Revolution, rural abandonment has depopulated inland areas, while the repopulation of wildland-urban interfaces today has increased the ignition likelihood and reduced ecological awareness[1,3]. Industrialization and tertiarization of rural territories have transformed historical mosaic-like forest systems into homogenized landscapes, increasingly vulnerable to fire[26].

The notion of ecosystem services assigns economic value to nature's component[27], while the concept of ecosystem functions[28] emphasizes the biophysical processes sustaining multi-species well-being.

The SES framework is particularly suitable for wildfire analysis, since it bridges quantitative data from natural sciences with qualitative insights from social sciences[29]. Most studies on wildfires adopt quantitative or statistical methods, followed by qualitative approaches, while few apply historical or vulnerability analyses[30]. Within SES, responsibilities are distributed across multiple levels of power, action, and agency.

The participatory approach, promoted by the social sciences, is highly effective in this context[31]. Direct involvement and collaboration between communities and local institutions promote decision-making processes based on needs and capacities, integrating local knowledge and avoiding top-down decisions detached from local realities[32].

Among derived SES frameworks[33], Ostrom's (2007, 2009) is the most appropriate for studying wildfires. She argued that complex problems require complex solutions and that common-pool resources

[24] Cristofari et al. 2023; Vigna et al. 2021.
[25] Otero 2022.
[26] Uyttewaal et al. 2023.
[27] Chastain, Islar 2024; Loos et al. 2023; Sullivan 2011.
[28] Groot 1992; Hermann et al. 2011.
[29] Schlüter et al. 2019.
[30] Oliver-Smith 2022a; Vigna et al. 2021.
[31] Fuchs et al. 2011; Marciano et al. 2024.
[32] Maru et al. 2014; Power et al. 2018; Tedim et al. 2016.
[33] Binder et al. 2013.

should be managed to avoid overexploitation, an objective reachable through participation. SES frameworks also emphasize the need for transdisciplinarity, engaging ecology, political science, geography, and economics[34]. This enables a comparative analysis of multiple perspectives through a shared vocabulary[35].

Ostrom marked an epistemological shift by showing that resource governance can emerge from collective self-organization. This concept replaces the state-market dualism with a polycentric governance model[36]. Polycentric governance implies multiple, interconnected centres of decision-making that are autonomous but coordinated, and able to context-specific adaptation[37]. Bottom-up cooperation and autonomy are emphasized. Although not explicitly anarchist, her framework assumes social balance can emerge through self-organization and collective decision-making. This theory increases individuals' capacities for reasoning and imagining complex institutional environments.

4. *Critical Disaster Studies*

The Critical Disaster Studies (CDS) approach gives new perspectives on environmental disasters. This approach emerged from catastrophic events (hurricanes, earthquakes, etc.)[38]. In wildfire studies, this approach is most significant because of the unique relationship between humans and fire. According to the Marxist tradition of the Frankfurt School in Europe, a theory is considered critical if it promotes human liberation from oppression and exploitation, offering a perspective "to create a world which satisfies the needs and powers of human beings"[39].

Within CDS, the critique is of the structural nature of disasters, opposing purely technical approaches[40]. This framework examines the unequal distribution of risk, vulnerability, and impacts, and recognizes risk as a social construct rather than a product of natural events[41].

[34] Mattor et al. 2014.
[35] McGinnis et al. 2012.
[36] Ostrom 1990; 2007; 2009.
[37] Agrawal, Ostrom 1999.
[38] Oliver-Smith 2022b.
[39] Horkheimer 1972.
[40] Chomsky 1964.
[41] Maskrey 1993; Oliver-Smith 2022b.

Decolonialism, intersectionality, and critiques of Western epistemologies are central and liked concepts in contemporary CDS[42]. Two key concepts are vulnerability and resilience.

Vulnerability refers to a community's susceptibility or resistance to disturbance[43], influenced by the current ideological, social, and economic systems[44]. According to this paradigm, risk analyses should focus on power dynamics, economic interests, and institutional politics[45]. Due to its systemic origins, a historical and multiscale analysis is required, including those of colonialism and gender[46]. Intersectional and transdisciplinary approaches help deconstruct these patterns and counter exclusion[47]. Resilience refers to the system's ability to change while maintaining a central stability[43]. This concept expresses a community's agency, solidarity, and adaptability[48].

Under neoliberalism, resilience often implies individual solutions to structural problems, enduring unsustainable or erosive systems[45,49]. Conversely, vulnerability may be used to delegitimize local populations and perpetuate victimization[50]. Generally, neoliberalism reshaped the relationships between capital, labor, nature, and government[51]. The reduced role of governments and the commodification of rights have produced inequality and ecological degradation[52]. Disasters reveal these contradictions, embodying neoliberal disasters rather than natural ones[53].

5. *Risk formula*

According to Fischer et al. (2016), wildfire risk arises from the interaction between fire and human vulnerability, which is mediated by socio-ecological factors such as land use, climate, human practices, policies, and resource management. However, most risk assessments still prioritize physical factors (i.e., hazard and exposure) while over-

42 Gaillard 2019; García López 2020; Maldonado 2018; Rivera 2022.
43 Young et al. 2006.
44 Blaikie et al. 1994; Wisner et al. 2003.
45 Tierney 2015.
46 Oliver-Smith 1999; 2010.
47 Andharia 2020; Chávez-Rodríguez 2016; Vickery 2018.
48 Nelson et al. 2007; Oliver-Smith 2022a.
49 Lavell, Maskrey 2014.
50 Cannon 2008; Marino, Faas 2020.
51 Guarino, Yaşın 2025; Harvey 2007; Krüger et al. 2015; Ortner 2011.
52 Tsing 2024; Vera-Cortes, Macías Medrano 2020.
53 Harvey 1996; Smith 2007.

looking the social dimension. The classical formula R = H × E × V (R: risk, H: hazard, E: exposure, V: vulnerability)[54] requires revision to include risk perception as a key variable.

Vulnerability and resilience require an intersectional analytical framework that integrates social aspects into wildfire risk assessment. Including the perceptions of both experts and non-experts would center those directly exposed to risk, acknowledging their specific needs and encouraging participation in decision-making.

6. *Risk perception*

Though not among the most prominent global risks, research on wildfires is focused on regions such as the United States, Australia, Canada, southern Europe, China, South Africa, and Brazil[55]. Despite decades of work on risk perception[56], few studies have addressed wildfire specifically, underscoring the need to deepen the topic[57].

Risk perception depends on psychological attributes (e.g., fear, familiarity, exposure)[58] and on emotional and cognitive processes influencing decision-making[59]. Local knowledge, social interactions, and the relationship with place shape the community response to fire[60]. Risk perception can influence engagement in risk reduction activities[61]. Experience of past fires raises awareness only temporarily, thus risk perception fades over time[62]. Individual perceptions also affect collective behavior and land management decisions, with social and environmental consequences[63].

People tend to favor short-term responses over long-term strategies, reflecting delays between hazard occurrences and human intervention[64]. Shared community knowledge can erode cognitive limits and enhance awareness of interventions[65].

[54] Burton et al. 1994.
[55] Neger, Rosas-Paz 2022.
[56] Slovic 2016.
[57] Daniel et al. 2007; Raftoyannis et al. 2014.
[58] Daniel et al. 2007; Slovic et al. 1979.
[59] Finucane et al. 2000; Kahneman 2003.
[60] McCaffrey 2015.
[61] Ager et al. 2015; Champ et al. 2013; Fischer et al. 2014.
[62] Cohn et al. 2008; Gordon et al. 2012; Spano et al. 2021.
[63] Beratan 2007; Hamilton et al. 2019b; Klöckner 2013.
[64] Dorner, Rosen 1990; Fischer 2018; Steen-Adams et al. 2017; Sterman 2011.
[65] Freitag et al. 2019; Krause et al. 2010.

Ecological feasibility, economic viability, and cultural congruence with local practices are key factors for the acceptance of landscape management[66]. Adaptive wildfire management has to integrate local perceptions and values[67].

7. *Fire-adapted communities*

Elinor Ostrom's (1990) work on common-pool resources shows that self. Origanized, trust-based, and adaptive community management can outperform state or private controls. Community initiatives such as Firewise Communities in Canada and the U.S., Prescribed Burn Associations in the U.S., Smart Fire Territories in Portugal, and silvopastoral programs in Spain and in France, illustrate how participatory governance can enhance ecological resilience and social cohesion[68].

Each of these models could be implemented through Ostrom's principles of shared territorial responsibility and co-management[69]. Local communities hold the primary and most complex role in preparation, collaboratively drafting territorial management plans with local administration[70]. Long-term mitigation and preparedness can be boosted if community-agencies cooperation considers local economy, social equity, environmental conditions, just decision-making processes, and overall quality of life[71]. Grassroots organizations emerged as key actors in prevention[72]. Developing fire-adapted communities requires planning that harmonizes fuel management needs and fire protection strategies among local actors[73].

In Tuscany, Italy, agro-ecological cooperatives reintroduced traditional land management practices, such as controlled grazing and firebreaks[74]. These initiatives demonstrate how local actors can reclaim agency over their territories. Tuscany hosts emerging Firewise com-

[66] Clawson 2013; Daniel et al. 2007; Firey 1960.
[67] Jakes, Langer 2012; Paveglio, Edgeley 2017; Toman et al. 2012.
[68] Leone et al. 2020; Otero, Nielsen 2017; Paveglio et al. 2019; Tedim et al. 2016.
[69] Daniel et al. 2007.
[70] Steelman 2004.
[71] Beckley 1998.
[72] Ottolini et al. 2024.
[73] Ager et al. 2015.
[74] Greco et al. 2025; Treakle 2019.

munities[75]. They adapt the U.S. model to local contexts and represent early experiments in self-organized community's wildfire management. Future comparative research between similar regions (e.g., Catalunya and Tuscany) could enhance mutual learning and resilience.

8. *The Tuscan case study*

In Tuscany, as in other Mediterranean regions, land abandonment and the decline of agroforestry practices have produced homogeneous, highly flammable forests, replacing the historical mosaic landscapes, where forests coexisted with fire-generated open spaces, representing biodiversity peaks[76]. Agro-silvo-pastoral systems fostered ecological, cultural, and economic diversity across Tuscany[77], Spain[78], and France[79]. Rural depopulation and the rise of urban-centered economies have transformed the countryside into a landscape commodified for agritourism and industrial production, privileging vineyards and olive groves monocultures over the ecological functionality[80]. Another structural issue is land fragmentation: Tuscany's historically privatized parcel structure leaves many plots abandoned and highly vulnerable to fire[81].

In this area and context, an application of this theoretical framework was implemented through diverse methodologies, in order to understand risk perceptions across the territory and understand the current effective conditions and how to improve the community's awareness. The investigation revealed that wildfire risk perception is not only an outcome of environmental or institutional factors but a dynamic social construct influenced by experience, communication, and participation. The historical memory influences awareness in the short term, while long-term and structural change require specific actions targeting behavior and understanding, through education, training, and engagement. Thus, acting on risk perception can reduce social vulnerability. A the governance level, Italy's institutional system

[75] Retrieved from: https://www.regione.toscana.it/firewise-comunit%C3%A0-antincendi-boschivi [Accessed 21st July 2025].

[76] Lasanta et al. 2022; Salis et al. 2022; Seijo, Grey 2012.

[77] Amici et al. 2015; Uyttewaal et al. 2023.

[78] Guadilla-Sáez et al. 2019; Seijo et al. 2018.

[79] Coughlan 2014; Lambert 2010.

[80] Agnoletti, Santoro 2018; Gaggio 2016.

[81] Agnoletti, Santoro 2018.

remains fragmented, with a predominance of an emergency response approach. A reorganization of decision-making processes is necessary. Media analysis highlighted the episodic and sensational nature of wildfire communication. Developing communication strategies that prioritize continuity, clarity, and education can contribute to greater preparedness. Questionnaires showed that the differences in perception are more significant between experts and non-experts than across localities. However, both groups agree on the centrality of public action and prevention. Interviews revealed that communities demonstrate strong collaboration during emergencies but limited participation in everyday management. Strengthening relationships among institutions, citizens and associations is crucial for enhancing community resilience. In conclusion, prevention, coexistence, and participatory planning represent essential paradigm shifts for the future.

Notes

For more information about this study, please refer to the current references, where the main framework is addressed: the topic of communication and media is deepened in Calvani et al. 2025a; the current conditions of the Italian wildfire governance system is addressed in Kirkschner et al. 2024; the investigation of perceptions through sociological methodologies is finally dealt in Calvani et al. 2025b.

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Sugarcrete® – Material matters in equitable development

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Abstract

Heritage, vernacular production of building materials and traditional construction inform biomaterial design and innovation – both of which are centred on the role of people in the social and economic distribution of what can be termed 'sustainability'. Heritage and sustainable material innovation are two aspects of the same issue – to critique the means by which we produce the environments we inhabit and to radically reinterpret them for community and environmental gain. Carbon and culture are inextricably linked through a colonial history – the climate emergency creates the context for research to create necessary change.

The Sugarcrete® team won the Times Higher Education Knowledge Transfer Initiative Award 2024, the Built by Nature Prize 2024, and a Climate Positive Award announced at COP29. Sugarcrete® was nominated for the 2024 Earthshot Prize and the Dezeen Sustainability Award. Sugarcrete® has partnerships in more than 20 countries across the Global South and is structured as open source to advance the decarbonization of construction materials in as ethical and democratic a way as possible.

Current Sugarcrete® projects under development include a school and community centre in Hisar, India, with the Paryatan Foundation and a school for 800 pupils for the NGO Nenita Sa in Guinea-Bissau, West Africa.

Bio: Alan Chandler is a specialist conservation architect and senior pracademic at the University of East London. He works with fellow architect and senior lecturer Armor Gutierrez Rivas and materials scientist Dr Bamdad Ayati at the Sustainability Research Institute, developing the material, supply chain, ethical deployment framework and partnerships that have created Sugarcrete®.

Keywords: Sugarcrete, Development, India, Bio-materials, sustainability

"We, the Commonwealth Heads of Government acknowledge the need for integrated strategies for safe and sustainable urban development that enhance community wellbeing and security"[1]

There is a lot to unpack in this declaration from the 54 countries of the British Commonwealth. 'Sustainable development' appears to be in the 'Brundtlandian' tradition[2], which 'gives us what we want in a way that our children can get what they want'. This position is clearly contested by those for whom 'regenerative development' requires not only meeting our needs but that of the planet equally – and compromising accordingly. Whilst the regenerative version[3] is arguably unlikely to fit our current economic and political parameters, we have to decide where we as individuals position our activity, and to what end?

But let's stay with 'development' for the moment. Understanding what we mean by development is perhaps the first stage in defining how it may be reconsidered to be 'sustainable'[4] as stated in the Declaration. Note that my presentation title has already interfered with it, the inclusion of the word 'equitable', which is notably missing from the intergovernmental declaration, complicates this already dense word.

'Development' is after all 'a process', an 'event' and a form of 'territorial exploitation'[5]. Quantifiable and financial aspects of this triple-layered activity dominate our current understanding – do we simply

[1] Commonwealth Heads of Government 2022.
[2] WCED 1987.
[3] McDonough & Braungart 2002.
[4] Mang & Reed 2020.
[5] Oxford English Dictionary n.d.

sustain development to ensure it will sustain at least some of us, or do we use materials, their processing, deployment and supply chains to reinforce equity between people and with their environment, using materiality itself to rearrange social and supply-chain organisation to tackle systemic problems?

The Sugarcrete®[6] research journey created new insights for its instigators into the politics of sugar, its ubiquity, dominance, exploitative practices, dependencies and opportunities. Sugarcane is the world's largest crop at 2 billion tonnes per annum[7]. Through its sheer scale of production it is the most effective agent of carbon sequestration available to us, whilst at the same time we are cognisant of the shadow of exploitation and health disbenefits that sugar carries. After engagements with parties in nearly forty countries, our key partnership has been in India, second only to Brazil in global sugar production, and a place where we can confront that shadow.

We have come to understand that transforming sugar into a construction material has the potential to displace another of India's exploitative industries – brickmaking. India's rural poor – many of whom are of the Dalit community (formerly known as 'untouchables'), are the common currency for both industries, migrating between sugar harvest and coal-fired kiln work which employs 15 million people who co-create the world's second most polluted city – Delhi.

Sugarcrete®'s authors consciously sought to address the triple-bind of development whereby localised, open-source innovation deploying the fibrous by-product of cane processing – called 'bagasse' that, when mixed with readily available mineral binders can replace the extractive, oppressive and polluting processes that create the bricks which physically build India's new urbanism. However, the real question is even more complex – can an ethical, sustainable material be derived from a tainted industry to subvert another tainted industry? What mechanism can set a thief to catch a thief? How can the workers gain agency through this innovation and how can the contested carbon credit marketplace be leveraged ethically to support this process? The layered meanings of the word 'development' hint at the contradictory nature of its practice, which is intrinsic to the capitalist project.

[6] University of East London n.d.
[7] Voora et al. 2023.

1. *Sugar versus brick fields*

The overarching and serious game into which Sugarcrete® fits is a tale of two industries – two modes of production yet ironically symbiotic, with seasonality bringing them together for the labourers. During cultivation periods that require fewer migrant workers, brick making provides their income source, with the September monsoon season disrupting both forms of production[8]. Workers move from sugar fields to brick fields, where latterly the sub soil itself is harvested to a metre depth for clay, one field extracting from another.

The long-term consequences of soil depletion are not addressed by the authorities as the scale of India's twin economic fields can currently sustain each other, but as development accelerates so too will the loss of sub-soil clay, the consequences beyond sugarcane production remain unmapped. Exploring the nature of both fields gives a practical context to the rationale behind Sugarcrete® – a way of using material to illuminate theoretical contradictions rather than a theory to illuminate material contradictions.

The sugarcane crop matures within 10-12 months in Northern India and 12-16 months in the South depending upon the variety and season, harvested when the sucrose content value reaches a minimum of 16.5% with 85% juice purity[9]. In Uttar Pradesh alone, 22.5 million metric tonnes harvested equates to almost 45% of India's yield. That harvest generates bagasse – in some cases such as Belize it is an essential biomass for fuel displacing oil imports from Mexico and giving some scale of energy autonomy, elsewhere, as in India with an advanced low carbon energy sector the carbon sequestered in the bagasse does not need releasing into the atmosphere along with PM 2.5's and could contribute to something more significant as we try to decarbonize construction globally.

With 20,000 kg of bagasse generated every second, in the time taken to read this paper 72 million Sugarcrete® blocks could be produced, which is 10,000 eighty square metre houses. The marketplace for decarbonizing construction is a crowded one, so comparisons are inevitable as bio-solutions jostle for attention. However, biomaterial performance and carbon quantification is only one aspect, land is

[8] CEC & PCLRA 2020.
[9] Gupta n.d.

another. The surface area of the planet required for the go-to sustainability solution, forestry and the duration the timber crop takes, allied to monocultural practices and the Global Warming Potential linked to Albedo when plantations are razed, prompts us to consider material solutions to development more strategically[10].

The scale of sugar processing, evident at one of our Indian partners processing mills in Daurala near Delhi equates to 7 million tonnes of 'bagasse' available for transformation into building blocks. Shriram Industries has an audited ethical supply chain, elsewhere such a scale of production is not without a cost. Research over the past decade has concluded that whilst integral to sugarcane cultivation in rural India, female sugar workers are India's "hidden farmers" [11] with salaries on average half of male workers for a comparable working day. This seasonal work model is insecure, wages low, education and self-development sporadic, with land ownership amongst women still uncommon. Women participate in planting, weeding and during harvest de-leafing the canes. Hysterectomies are commonplace to sustain a woman's ability to work[12] because female and child labour is cheaper than employing men.

The material reality of brick and sugar production physically converges in the red clay of Bihar and Uttar Pradesh states, kiln chimneys standing like Surrealist crematoria in a green sea of sugarcane, their relationship extractive rather than symbiotic, the use of the sugar field workers to make bricks providing a social extraction with comparably degrading results.

Material is political. It is the currency by which the desire for development to both allay need and fulfil desire is traded. The 'Make in India' programme was launched in 2014 aiming to promote local manufacturing. As Priya Joseph asserts, the 'event' of building of the temple in Ayodhya with bricks made across the nation was used to orchestrate a narrative of collective identity[13], aligned to what can be seen as right-wing political nation building, with the Prime Minister of India laying his own solid silver brick in media solidarity. The disparity between the value of Modi's silver brick in relation to the half

[10] Sánchez et al. 2023.
[11] Sanghera & Sharma 2015.
[12] Rajagopalan & Inzamam 2024.
[13] Joseph 2020.

of one cent earned by the kiln workers to make their brick is stark, both in political rhetoric and in cash terms.

Set against this high-level messaging is a more concrete reality. The Indian brick sector is not organised and is under-regulated, with informal/migrant workers moving from kiln to kiln, seldom holding identity documents or a 'Mamta card' – issued to pregnant women giving access to basic healthcare and food and vitamin rations, or the Aadhaar, a biometric identity card – for fear of losing them on their long journeys or in insecure temporary housing. Without this they have no social safety net. Workers from outside a State cannot access antenatal or child health care[14].

Adults and children alike work 12-15 hour days in unsafe conditions, heat stress and pollution levels violating International Labour Organization definitions of 'decent work'[15]. Fieldwork with anonymised interviews of migrant workers in the brickfields of Bihar notes that 34 percent of the population are children below the age of 14 and 41 percent are minors below 18[16]. Around 140,000 brick kilns in India produced more than 20bn bricks in 2024 – the year of India's longest heatwave when schools were forced to close, but the brick kilns continued firing.

Across 200+ days of the 2024-25 brick-making season 'Firemen' feed coal dust into each kiln every 10 minutes of every hour of every day – each firing lasting a month and producing between 1 and 1.5 million bricks per kiln[17]. The labour model for both sugar field and brick fields workers is to pay at the start of the cycle, remain in debt at the close. In the brickfields such contracts require the production of 1,000 bricks for 5 dollars regardless of rain or technical setbacks creating a form of bonded labour, witnessed by the authors in India where each kiln visited revealed the relations between workers and owner akin to that of Squire and Serf.

The authors' personal experience prompted Sugarcrete® to transition from simply a material innovation to a social innovation, developing an open source 'social production' initiative to support the cre-

[14] Yadav 2024.
[15] Maithel 2020b.
[16] Maithel 2020a.
[17] Anuja 2024.

ation of safe and carbon negative building blocks via a mechanism of knowledge dissemination, co-creation and associated micro-finance to fabricate a new, localised production model. The primary challenge has been to conceive of a process that places production within workers' hands. In response to the sugar field and the brick field, Sugarcrete® needs to define a 'social field' – in addition to agreeing shared intellectual property arrangements, certifying to ISO and national standards, developing a full-scale manufacturing process, quality assurance, ethical supply chains and trackable carbon fingerprinting.

Composed of around 50% bagasse, 50% locally sourced non-coal fired building lime, Sugarcrete® is designed as a lightweight, fire-resistant cast alternative to fired clay bricks for non-structural use. Earthquake regions require concrete frames, so the fired bricks compression capability is wasted and its ability to heat up like an oven in Summer and stay cold in winter whilst allowing any occupant to listen to their neighbour through a thin brick wall makes it the least useful construction option available, whilst maintaining its cultural imaginary as a continuity with historic forms of mud brick and adobe construction that characterised Indian village identity, but when built traditionally simply which worked much better.

The IPCC notes that there is a rapidly narrowing window of opportunity to enable climate resilient development... where development trajectories are shaped by equity, and social and climate justice.[18] The manufacturing of Sugarcrete® can be safely undertaken by men or women within local communities creating low-cost insulated walls that can mitigate against heat, can buffer airborne moisture and acoustically insulate. The cost of a Sugarcrete® block is equivalent to a fired clay brick but without the associated air pollution and health threats and is half the weight.

Linking a residue stream from sugar production to simple, clean and economic zero carbon brick making is potentially a compelling solution if framed ethically. Diffusing production knowledge to localised rural communities will facilitate greater social and carbon impacts than by securing patents and licences. Through introducing this new technology, new opportunities for income generation, skills acquisition and cleaner forms of labour become available. Women

[18] IPCC 2023.

can play an important role in this redistributed production process that can fit around cane cultivation tasks that they can continue to be a part of, but which extend, adapt and incentivise their economic contribution.

We understand the current sugar cycle as linear, resulting too often in the carbon captured being released. Involvement with communities across the country can create equitable carbon and societal impacts, using a circular economic model that extends from simply a material cycle into a social cycle, the workers no longer need to migrate to kilns for employment after harvest, enabling within-state healthcare support and bypassing the toxic heat and pollution stress of kiln enabled brick making.

The first building made from Sugarcrete® was designed in October 2023 and completed for a state school in Noida, Uttar Pradesh by September 2024 through a partnership between Chemical Systems Technologies in Delhi and the University of East London. Basic mixers and hydraulic presses were developed to create low cost, simple to operate and maintain manufacturing equipment, tested by making our new school building hosting a sustainability technology hub, which is being monitored by our PhD team for thermal, humidity, acoustic and air quality during 2025, the data explained and shared with the student users as they receive training that is intended to support the next generation of workers in low carbon industries.

2. *Paryatan Foundation*

Our second Sugarcrete® building project in India is a school and community centre in Hisar, Haryana State run by the Paryatan Foundation for a peripheral community unable to access education for its women and children, replacing the school's rented accommodation with a hybrid Sugarcrete® building designed around passive cooling. A process of co-design generated drawings and documents that local architect and engineer partners are working with us to deliver required consents. For construction, the community the Foundation serves will be taught by the Sugarcrete® team how to fabricate their own blocks to both reduce supply costs and to upskill the residents. Six housing plots have been purchased and the process is underway for construction in 2026.

We acknowledge that biomaterials are in many respects a pre-industrial, pre-colonial answer to development, one that Europe eradicated at home and then globally in order to industrialise the planet. It is ironically Europe now diligently promoting biomaterial solutions to its subsequent carbon crisis – hemp, mycelium, bamboo, rice husk tested and blended in European laboratories to great fanfare as we see our great plan called modernity turning out to be less than great. The potential to simply propagate Eurocentric interests is depressingly familiar, which is why Sugarcrete® is collaborative, partner focussed and is manifest through co-design methodologies. In Guinea Bissau we combat imported concrete blocks and corrugated sheet roofs with our Sugarcrete® innovations, quietly reimagining for communities still labouring under the myths the Portuguese delivered. A new 800 student school for the Nenita Sa Education Foundation has been developed in October 2025 in a co-design workshop to support a modern solution to school design using bio-based materials that the pupils' grandparents were expert in building with and which their parents can realise as a genuine location-based solution to their needs.

However, to enable this empowerment strategy we need another thief. Carbon Credits are generally linked to the 'purchase' of forestry that sequesters carbon over a stipulated period to 'offset' CO_2 emissions. In recent years this widely criticised deferral mechanism, that allows the polluter to effectively sustain unsustainable practice, has started to evolve.

The shift to encompassing construction materials that sequester carbon within the Carbon Credit mechanism is the newest manifestation of so-called 'green capital'. However, the conversion of a tree's living biomass to timber's dead biomass within a built development has created a new level of tension within the sector. As with most capitalist schemes of whatever colour, ethical alarms are sounding loudly. Sugarcrete® avoids the 'dead biomass' critique as it is an agricultural by-product that sequesters 40 times the carbon of forestry per equivalent land area, with one cubic metre of Sugarcrete® encapsulating 170 kilograms of CO_2 emissions. Replacing fired clay bricks or concrete blocks in a small single-storey building with Sugarcrete® saves approximately 120 tonnes of CO_2 emissions per house. In terms of the 'end of life' scenario for Sugarcrete® is re-usable for future construction and eventually can return to the soil as an agricultural improver along with its alkaline binder.

Development is after all 'a process', an 'event' and a form of 'territorial exploitation'. The process of developing Sugarcrete® has been one of navigation, understanding the scale of sugar and its relationship with brick making, the events of its workers lives and therefore the unprecedented scale of bonded labour that Karl Marx or William Morris would instantly recognise as belonging to their century, and which has persisted consistently ever since[19]. Sugarcrete® is not without shortcomings, as a material innovation it is required to accept the reality that much sugar production is as morally flawed as the cane's carbon sequestration is admirable. We return once again to the vexed notion of setting a thief to catch a thief. By replacing the event of coal-fired clay with biomass-based carbon sequestration, replacing airborne pollution, heat, soil degradation and penury with 'clean' alternatives and social agency, Sugarcrete® at least engages the three active components of sustainability – society, environment and economy, to redefine the process and event of development, diffusing production locally via Carbon Credit funded microfinance – an achievement we are ready to implement once financial backers step up.

However, we acknowledge that we are still providing the means for 'territorial exploitation' by others, and we ask ourselves in reality are we simply attempting to 'knock off the corners' of unsustainable urban development so it can be 'slightly less' damaging to planetary systems?

With the political right in India and elsewhere mobilising class through a nationalist lens and transforming it into an inverted, militant status quo, we feel compelled to do the opposite. In the end we are idealists but also pragmatists. We understand and critique our pathway into markets, directing our research towards each barrier in order of priority to transform what we offer and what its value can become. Sugarcrete® is context specific, its process and events radically different from country to country. In 2024 we were invited to participate in a regional economic forum in Granada, Andalucia – home to Europe's only sugarcane region. The drivers here are more nuanced, less intense but no less important for regional equity, local opportunity and environmental gains.

Heritage, identity, tourism, vacated industry, the dead weight of nostalgia versus a genuine productive opportunity to transform the

[19] Power 1932.

local concrete industry, buried in the 2008 crash with a biomaterial revolution has engaged the municipality, investors and a consortium to create Sugarcrete® Spain SA – our first commercial spin-out.

In a European context the numbers relating to carbon emissions, performance values and datasets involved are interesting almost to the point of fixation, deployed where bio-based construction materials are obviously competing with their extractive, high carbon/low conscience competitors. However, we also need to think about what land can generate in value terms beyond numeric, and how bio-construction materials need to be part of an integrated agricultural strategy[20] which in itself is not a competitor for land destined for development, but is the mechanism by which it is developed.

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Alan Chandler, Brick Fields of Uttar Pradesh



Alan Chandler, Sugar Fields of Uttar Pradesh



Alan Chandler, Sugar Mill at Daurala



Alan Chandler, Women as Labour, Haryana State



Megan Jones, Sugarcrete®



Husain Akbar, Sugarcrete® School in Noida, Uttar Pradesh

From Red to Green: The role of Marx for earlier Eco-Socialism

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Abstract

In view of the tendency within recent strands of green Marxism to overlook or downplay earlier contributions, I recall three predecessors whose writings were, even in their time, remarkably forward-looking, and whose work I discuss critically: André Gorz, Rudolf Bahro, and Carl Amery.

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Keywords: ecological materialism, green Marxism, ideology critique, socialism, villages

My paper is a brief exercise in colour theory—one that, since Goethe's critique of Newton, can be considered a dissident science. As this conference on Marx in the Anthropocene unmistakably demonstrates, Marxism is once again considered a transdisciplinary school of thought, even a method of combining disciplines from the natural sciences, history, economics, and politics. That is crucial in our time of deep ecological crisis, of rapid climate warming and the extinction of species, which overshadows and prevails over all the social, economic and political crises. It is primarily a human affair, based in the way our economy was organized the last centuries, but we cannot grapple with that without including our embeddedness into nature and our non-

human others. Here, eco-Marxisms[1] as well as related approaches[2] have recently demonstrated significant theoretical strength.

Unfortunately, however, in large parts of the academic world, especially in the newer ecological approaches, there is still a prevailing opinion that Marxism was just another of the western 'alienated' sciences, leading to the destruction of the planet through their naïve belief in technological progress and an everlasting increase in industrial productivity that comes at the expense of the planet and non-human others (think of Timothy Morton, Donna Haraway, Bruno Latour, Val Plumwood and others). This conference is a sign that many, at least on the left, have realised that this is not the only way to look at things. Instead of setting red and green in polemical opposition, it is necessary to recognize their close connection. We cannot tackle ecological problems in a way that enhances global inequalities, and vice versa: if we wish to fight for equality, we can no longer do that at the cost of further exploitation of the planet. These are two sides of the same coin,[3] not only for pragmatic reasons, but even more so because nature and culture are not so different and separate from one another as we assumed for a long time. Eco-Marxism offers to combine these currents in a nonreductive way that overcomes dualism while avoiding monistic and differentiation-blind quick fixes.

For those who still remember the last century, this situation resembles an earlier historical phase, that from the early 1970s to the early 1980s, where we could already perceive a joining of forces between 'red' and 'green'. There already was a window of opportunity during these years, and much that was achieved in terms of ecological politics as well as cultural emancipation was based on these intellectual achievements. Unfortunately, a great bulk of this has been forgotten during the intellectual and political counterrevolution that followed, with the lost forty years of neoliberalism, starting in the later 1970s and ending only today, with the imperial behavior and authoritarian restructurings of the great powers. (I take neoliberalism to pay at least lip service to free trade, political multilateralism, and democracy – but these days seem to be over.) The financial crisis and the corona pandemic already shook some of the foundations, but politically as well as intellectually, today's low point is a clear maximum.

[1] Malm 2018; Foster 2020; Saito 2024.
[2] Callicott 2013 or Rolston 2011.
[3] Fraser 2022.

Unfortunately, with the rise of this global autocratic populism and its new wars we have a new problem that doesn't leave much time for reflection. However, in a conference like this, there should be time for some history as well. I think that is important, because in this new intellectual momentum of ecological Marxism, sometimes a strange ahistoricism is visible, as if the neoliberal amnesia has also wiped the memory of the left. Maybe this is partly so because the term Anthropocene induces a sense of urgency, a sense of sudden changes, the coming of the 'completely new' which eradicates everything old. In the realm of the intellectual, this resembles the very rapid succession of post-this-and-that-declarations, the constant proclamation of ever-new turns and epistemic ruptures: from poststructuralism to post-foundationalism to post-Marxism or posthumanism, from the pictorial to the material to the digital turn, etc., a marketing strategy of rebranding and forgetting very quickly what was there before. Hence, scholars are sometimes tempted to think that ecological Marxism has only been discovered now, with the escalation of the climate crisis and the discovery of the Anthropocene some twenty years ago. It then seems to blend with new materialism, posthumanism and AI – everything is artificial now. Because the language of the Anthropocene is so new and glittering, we are tempted to think with Latour that assumedly all of 'modern' thinking – including Marxism – had it wrong.[4] This revolutionary-sounding semantics had a remarkable influence on large parts of the academic world. I am afraid that is why some scholars assume that Marxism was primarily a modernist project based on the values of technical progress and productivism, until the day we discovered Anthropocene and all became Latourians. But this gives a poor picture of the intellectual history, both of the ecological movement, and of the history of socialist ideas.

Of course, the Anthropocene is newly discovered and experienced indeed – never before in our lifetimes have there been such sudden changes in the climate of the planet that were induced by human action. In the past decades, pollution and extinction figures have risen in an utterly irresponsible manner. But if we talk about Earth history,[5] I hope to be excused if I look back at least a few decades. Some other things are not quite new – for example the knowledge that we are con-

[4] Latour 2018.
[5] Chakrabarty 2021.

fronting a planetary ecological crisis. Ecological awareness was growing together with the industrial destruction of nature, and over the 20th century, with Aldo Leopold, Rachel Carson or Carolyn Merchant, we also learned that this comes with capitalism, or, as the Club of Rome made clear in 1972, with the limits of growth the capitalist mode of production encounters. Economic growth was debated at least from the early 1970s onwards – for more than half a century now.[6]

John Bellamy Foster and others have already worked on an alternative history of socialist ecology with impressive detail. But still we often get the idea that in the beginning, Marxists could only adapt ecological ideas as a contradiction to their socialist creed, and only later on 'red' and 'green' became really compatible. I wish to debate this assumption by looking at three stunning examples of an early version of ecosocialism, where Marxist ideas and an ecological mindset merged into one consistent and fascinating narrative, much earlier than the dominant narrative would expect it.

The three authors I wish to briefly look at share a generational formation. All of them witnessed the second world war and the boom after 1945, and all of them were reacting to the ecological crisis in the mid-1970s.

- André Gorz (1923-2007) was born in Vienna and became an important mediator between Italian, German and French theory.
- Rudolf Bahro (1935-1997), an East German dissident who co-founded the Green party in 1980, was born in 1935. I am looking into a text from 1980.
- And finally, a most important discovery for me is a liberal-conservative German author, Carl Amery (1922-2005). He was not a socialist, but a postwar novelist who became a severe critic of the church. Nevertheless, he adapted historical materialism in the 1970s, motivated by the ecological crisis.

Gorz is the most popular of these three. In papers of the early 1970s, he established ecological ideas from a Marxist background, and he clearly attacks economic growth as the heart of the problem – that is the combining trait that keeps red and green ideas together. If you look at the history of the degrowth movement, which offers one of the few answers how a future in the Anthropocene could look like

[6] Nelson 2026.

and is adapted by Ecomarxists as well, many of its ideas were already present in Gorz:[7]

• the idea of 'real or true wealth', which goes back to Aristotle and the young Marx, and which is undermined by monetarisation;[8]

• the idea that growth beyond this level of sufficiency becomes destructive,

• the Polanyian idea that 'scarcity' is a capitalist construction and an economy of the common good is to be preferred, because where people share their wealth there is no poverty. Where no one feels poor, growth is not needed any longer.

It is also stunning to see how Gorz anticipated the populist reaction to the necessary changes, by blaming foreigners and people who happen to be different. Ecofascism was on the agenda already in the 1970s. History repeats itself.

Let me pick out one topic from this book which is today more relevant than ever: the critique of the automobile. It demonstrates how a materialist critique of ideology can proceed, and reveals the emotional binding forces of fossil capitalism—forces against which purely cognitive argumentation remains powerless. This is why conservative and populist actors increasingly rely on the symbolic power of the car, even though it brings ecological catastrophe ever closer and worsens our lives. In his 1975 critique of the ideology surrounding the automobile, André Gorz exposed a fundamental impasse by identifying three contradictions.

1. The automobile is a luxury good whose meaning depends on distinguishing its owner from "ordinary" people. Once made accessible to everyone—as it occurred in the West in the twentieth century—it loses its use-value. This also explains the continuous growth of automobiles up to today's SUVs: as the status effect wears off, cars must become ever larger, heavier, more powerful, faster, and louder—qualities that are grotesquely detrimental to the functionality of driving and of being able to park quickly. This is not merely a matter of "mo-

[7] Gorz is not mentioned in Foster 2020; 2024, while Saito 2024 only touches him superficially. Gorz received a devastating attack by Bookchin 1980, pp. 289 ff., but that was based on Gorz being a Marxist (not an anarchist) and not reading enough Bookchin, who already formulated similar ideas earlier (e.g. the ideas on scarcity in Bookchin 1986).

[8] Cf. Skidelsky & Skidelsky 2013; Soper 2020.

ral depreciation" (Marx); the impossibility is not only psychological but also concrete and technical. If everyone wants to drive "quickly and easily" to work or on an outing, no one arrives quickly, everyone loses significant time. The figures Gorz cites (between 10 and 20 km/h in Paris; today it is 14 km/h) remain valid: in major cities, the average speed is no faster than it once was with a horse-drawn carriage or today is by bicycle. This applies to commuting as well as to holiday travel. The promise of being faster and more flexible than everyone else thus turns into its opposite.

2. The ideology of freedom results in radical dependence. The automobile embodied a response by the upper classes to the democratized mass transit of the railways, which had to be shared with others. It preserved the aristocratically tinted "attraction of the independent journey, following individual whims".[9] A central value attached to the automobile is therefore the promise of increased freedom. Yet this appearance also reverses itself: those who drive cars make themselves permanently dependent on external energy supplies and on specialists of all kinds ("for carburetion, lubrication, ignition …," to which digitalization must now be added), as well as on road and parking infrastructure. With the spread of the automobile, "the entire nation became a customer of the oil companies".[10] Because of this "radical dependence," Gorz even questions the very notion of ownership of automobiles: anyone who cannot care for their property themselves is merely a consumer, because the object cannot be used without the permanent purchase of additional goods and services. The promise that the automobile allows one to join the ranks of the "propertied" is thus fragile from the outset; despite ownership titles (often acquired through debt), drivers exercise very little actual control.

3. The continual increase in potential speed (broader roads, more powerful engines) leads to a greater loss of time, because we are compelled to cover ever longer distances. "In order to make room for the automobile, distances have been multiplied […]. Ultimately, the car causes more loss of time than time savings and creates greater distances than it overcomes".[11] This effect concerns our spatial relations to the world: suburban sprawl, the fragmentation of landscapes, and the

[9] Sachs 1984, p. 115.
[10] Gorz 1975, p. 56.
[11] Gorz 1975, p. 59.

desolation of cities and suburbs all stem from this unfulfilled promise of time–space compression. Thus, continuous growth results not only in massive loss of time but also in diminished quality of life in all the places that must endure this traffic, both urban and rural. The situation is serious.

This brilliant short essay by Gorz reveals the "adhesive" that holds automobile culture together, which makes parting from it so difficult for many, and at the same time exposes the irrationality of insisting on it. Embedded in the relationship to cars are promises that people are reluctant to relinquish precisely because they have not yet been fulfilled: the promise of social mobility and distinction, the promise of greater freedom (in the sense of independence), and the promise of unlimited freedom of movement. None of these has been realized, but anyone who, under these conditions, wants to "take away" the car encounters the anger of those who already feel socially downgraded. The insight that less automobility would mean more autonomy, better mobility, and less exclusion is lost when the substantive issue is displaced onto questions of identity. For precisely this reason, it seems nearly impossible to change anything in the domain of transport alone without addressing the broader systemic context. Gorz articulates all of this in a manner that continues dialectical thinking in the best sense, thereby bringing Marxism and ecological thought into close proximity.

Let me continue with Rudolf Bahro. He believed in socialism as workers' self-management and was disappointed with the reality he witnessed in East German factories. His book, *Die Alternative* from 1977, which was meant as a wake-up call for East Germans to discover the real socialism of cooperation and collective autonomy, appeared in West Germany and led to his imprisonment in 1977, until he could leave the country in 1979. In the West, he joined the discussion of the day and became an important founding member of the Green party.

He was arguing within the ecological movement as a representative of socialism, so he brought red into green. However, the decisive move in his writings is that colours no longer matter, because both fractions have to align anyway. Why? Because economic growth for its own sake has become the central problem both colours need to fight against. The green movement is opposed to growth because it provokes the "death of nature", as Carolyn Merchant called it in the same year.

But why should the red movement also fight growth? Because this, as a motive, sells out socialism. According to Bahro, socialism is interested in the development of the individual and overcoming social inequalities (here he echoes the larger school of socialist humanism, which in the 1960s and 1970s had united thinkers from both East and West). Economic growth was important as long as it provided the necessary means for this. However, for Bahro we already achieved that, so we should now switch to qualitative growth, the development of the individual. Keeping up economic growth in this situation is detrimental to human development. It leads to more inequality and alienation, to ecological destruction and pollution. Hence, wherever you start from, from red or from green, you get the same result. This message is still important: we cannot have meaningful ecological politics within capitalism, that was clear for him already, and it was too radical for the green party. This is the first insight we can draw.

A second insight is more disturbing: for Bahro it was important to join even more forces.[12] Combining red and green may be crucial, but it is not enough, if we really aim for change: as this was still a small minority in Western societies (at least as long as "red" does not include social democrats, but only socialists deeply critical of capitalism – in fact, however, social democrats of the 1970s were much more progressive than their contemporary offshoots are today).[13] Hence he argued for carrying the torch even further, into the disappointed parts of the population which had not necessarily been socialized on the political left or constituted the progressive urban elite. He believed that parts of the disappointed average people often voted conservative because conservatives had the narratives and symbols, the emotional bonds to connect to people unhappy with their lives. They managed to integrate them into the conservative project that promised a 'home' while destroying it at the same time. (That was the ideological component.) Conservativism, too, had undergone a drastic change, from opposing progress to endorsing it, as long as technical progress preserved existing power relations. They were only against progress the moment it touched the structures of family, state, private property, church and

[12] This is why he soon became unpopular within the Green party, which he left in 1985. For fellow green socialists (see Vollmer 2009, pp. 115-116), Bahro skipped over social questions too hastily and ultimately became too backward-looking in his rapprochement with conservative positions.

[13] Cf. Eppler 1974; Scherer & Vilmar 1983.

cars. But many conservatives were unhappy with this turn towards economic growth. That was a political momentum.

So Bahro's second message was that the green and red movements should try to integrate these disappointed conservatives, the "romantic anticapitalists". The reason that socialists opposed romantic capitalism was that some growth was necessary to avoid destitution, to come out of absolute poverty. But because Bahro believed this was no longer necessary, he challenged his fellow red and green leftists to reach out to conservatives and people who voted for them due to their disappointment with the destruction of nature and the hollowness of the new culture industry. (One point we could add to this in Bahro's defence is that Marx himself was very open to conservative writings, especially in the ecological context).[14]

In this, Bahro resembles Michael Löwy from Brazil, who recently also argued for ecosocialism and for integrating romanticism.[15] Like Gorz, Löwy (born 1938) had to emigrate from Vienna eventually to Brazil, due to some Jewish roots.

This opening towards conservative emotional politics, however, Bahro might have overdone, because in the end, the esoteric tendencies in his thoughts took over and he was accused of turning towards a questionable esotericism by his former comrades and colleagues.

With this, let me finally come to the third author, Carl Amery. As he was no socialist, he usually did not argue in Marxist terms, it was not his home turf. He was neither a Marxist nor a university teacher. He was a writer and novelist with a genuine interest in things. In his early days, he attacked the church, which was one of the cornerstones of the new German republic, and later on he founded the ecological E.F. Schumacher-society. He read whatever could help him grapple with his urgent questions – he read Marshall Sahlins' Stone Age Economics fresh from the printing press, he read indigenous sources and novels, and he also read Marx with an open mind and great interest, maybe for the first time in the 1970s. In his ecological treatise from 1976, he uses Marx a lot because for Amery at the time, Marxism was simply the best theory around to deal with ecological questions. That is quite remarkable for the early 1970s.

[14] Saito 2024, pp. 114-115.
[15] Löwy 2015; Sayre & Löwy 2020.

Amery's main question was why on the one hand, societies were programmed toward economic growth – it seemed like a cornerstone on which society was erected. On the other hand, this growth led to the greatest problem of our time: ecological destruction, which may soon destroy our whole civilisation. This is such a massive contradiction that people were thrown out of their routines already back then. It is stunning to see how this contradiction was a certainty for open minds already half a century ago. Like Gorz, he vividly describes the destruction of villages, forests, rivers, landscapes around him that was happening in the 1970s. (I read that during Covid and lockdown, which was a remarkable experience.) A little later, he wrote some sci-fi novels where people returned to Stone-Age-Economics – obviously this approach by Sahlins did have an influence on him.[16] Amery concludes that if we do not have the intellectual means to understand why we are engaged in a practice which is evidently leading into destruction, something is wrong with all our philosophy and science, with the way we understand ourselves.

In reaction, he tries to reassemble a new science from the best approaches he could get his hands on: he called it ecological materialism, inspired by historical materialism, combined with ecological sciences, that is: seeing everything as embedded in ecosystems and natural conditions. He condenses this in an 'eleventh thesis' clearly modeled on Marx: "Hitherto, materialism has been content to change the world. The point now is to preserve it".[17] To me that sounds like Dipesh Chakrabarty (and it makes me wonder why there is such a hype around him). Amery also takes Materialism literally: just like new materialism does today, he claims we should take matter much more seriously. We did not cherish our relations to the material world enough. And like James C. Scott,[18] he saw the neolithic revolution as a backlash – people became vulnerable to enemies, ate less healthily and attracted diseases, and invited the institution of the state to exploit them with taxes.

Finally, his critique is already addressing Anthropocentrism as a trait that only developed in the last 300 years with capitalism, and needs to be overcome. In this alternative history of humanity (which

[16] Cf. Graeber & Wengrow 2021 today.
[17] Amery 1976, p. 184.
[18] Scott 2017.

has been rewritten in recent years many times over, most reliably by David Graeber), he does not embrace progress as a necessary evolution towards the better. Rather, he sees the constant changes and many risks as deeply troubling. Is there anything good in this human history of exploitation, war, destruction, and oppression? Amery could only identify two phases in human history, and here he sounds like Rousseau, where he sees a realistic possibility for a lasting and sustainable human happiness, embodied in stable and reliable social communities and respectful interactions with nature: the Stone Age economics that lasted for tens of thousands of years and resulted in artworks that we can still admire (in cave paintings all over the world), and the small, almost self-sustaining agrarian villages you find all over the world, based on subsistence economies. We find those also in Asia or medieval Europe until the mid 20th century. This has made a comeback as well – practically in the ecovillage movement, and theoretically in ecomarxist literature. Saito, e.g., cites Marx's description of Indian villages, but this was also a key idea in Gandhian economics.[19] I find that, again, very inspiring, as it connects both to the boom of indigenous philosophy today and to the movement of transition towns and ecovillages that are very relevant to the ecological movement. In short, the Anthropocene is new, but there is a lot of continuity to older ideas – which, alas, are often not remembered too well.

Here, a rather 'bourgeois' novelist was inspired by the ecological crises to read Marx as a toolkit to address it, and came up with the most radical ideas, that we today see as the most recent development. This shows that Marxist scholarship had developed to such a degree that even non-socialists took over this method to tackle ecological problems. This is exactly what Bahro had in mind when he pushed to integrate disappointed people and be open towards conservatives. It also comes close to what the eco-anarchist Murray Bookchin developed in his philosophy of cities and villages. In our times of populism this is crucial: not everyone who votes for populists is lost, maybe it is possible to win people over if we work on a narrative that can convince people outside our narrow circles, by having the most convincing arguments on our side. By this I do not mean that we should become theoretically arbitrary—quite the contrary. There are good reasons today to adopt a critical stance toward capitalist growth and the social

[19] Kumarappa 1938; 1948.

and ecological catastrophes it continues to unleash. But in order to prevent these outcomes, we should avoid sectarian trench warfare. There are points of connection in older traditions and in other social groups on which we can build, without having to become less outspoken in our theories.

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Ecocriticism Without Anti-Imperialism Is Just Gardening: Defining Dirty Dialectics

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Abstract

This paper argues for a *dirty dialectics* of ecocriticism – an approach that rejects the depoliticized, aestheticized, and often implicitly imperial forms of environmental humanities that dominate institutions such as ASLE and EASLCE. Drawing on Chico Mendes's warning that "ecology without class struggle is just gardening," the paper critiques mainstream ecocriticism for its detachment from global structures of extraction and its alignment with what Domenico Losurdo calls the "imperialist universalism" of Western Marxism. Through a re-engagement with Marxian dialectics, world-systems theory, and the anti-imperialist traditions of thinkers, the paper outlines a materialist ecocriticism attentive to capitalism's planetary operations. The concept of dirty dialectics is further illustrated through a close reading of Azfar Hussain's *Dhaka and Dirty Dialectics*, which exposes the commodification of culture, the violence of global capital, and the contradictions of ecocriticism and world literature under a unipolar order. The paper concludes by proposing a multipolar, planetary ecocriticism – one that abandons purity, embraces historical "dirt," and positions literature as a tool for anti-imperialist ecological struggle in the Anthropocene.

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Keywords: Anti-imperialism, Ecocriticism, Dirty dialectics, Marxism, Critical theory

1. *Introduction: Towards a Dirty Dialectics of Ecocriticism*

In recent years, ecocriticism has increasingly drifted toward what Chico Mendes famously dismissed as *"ecology without class struggle"* [1] – a kind of intellectual gardening that focuses on local sustainability or aestheticized "green" sensibilities while leaving global structures of extraction and imperial domination unchallenged. This paper argues that much contemporary ecocritical work reproduces this depoliticized tendency and thereby functions as *ecocriticism without anti-imperialism*. The problem is already implicit in Ursula K. Heise's *The Hitchhiker's Guide to Ecocriticism,* where she notes that the field often rejects economic globalization while celebrating cultural border-crossing, without adequately confronting how these two forms of globalization are materially intertwined. As Heise observes, ecological issues sit at the intersection of politics, economy, technology, and culture – yet ecocriticism frequently isolates the cultural from the structural.[2] It is precisely this disconnect that I identify as a central contradiction motivating the need for a *dirty dialectics*.

This tension forms the basis for the development of my argument. Earlier in her article, Heise traces the institutional expansion of ecocriticism through organizations such as ASLE (founded 1992) and its offspring chapters in Australia-New Zealand, Korea, Japan, India, the UK, and later the European wing EASLCE.[3] Viewed from an anti-imperialist perspective, this geographical pattern is striking: nearly all these chapters emerge within states aligned with the Western "rules-based order." This distribution suggests not merely scholarly diffusion, but a soft-power cultural architecture that reinforces existing geopolitical hierarchies – an aspect that has become even more visible in recent years. *Dirty dialectics* seeks to confront this embedded imperiality rather than reproduce it.

This leads to my call for an ecocritical practice grounded in Marxian dialectics and a clear confrontation with empire – one that rejects the false purity of "green" discourse and instead embraces what I will further elaborate in this paper. I later exemplify this concept through an analysis of Azfar Hussain's poem *Dhaka and Dirty Dialectics*. Draw-

[1] Aloyokin 2023.
[2] Heise 2006, pp. 513-514.
[3] Heise 2006., p. 505.

ing on Marx and Engels, I distinguish between two broad strains of ecocritical thought. The first – represented by figures such as Lawrence Buell, Cheryll Glotfelty, Timothy Morton, Donna Haraway, and Alex Goodbody, and institutionalized through ASLE and EASLCE – largely abandons class struggle and ignores the Wallersteinian world-systems context. In doing so, it aligns with what Gillian Rose critiqued as neo-Kantianism, privileging subjective experience and affect theory. This tendency amounts to what Chico Mendes called "gardening without class struggle," revealing the underlying ideological limits of its ostensibly ecological agenda.

The second strain of ecocritical thought is more difficult to delineate, but Domenico Losurdo's critique in *Western Marxism* provides a useful point of departure. Seeking distance from the imperial-leaning tendencies that have shaped much cultural theory – from Gramsci through the Frankfurt School and the French Theory of 68 – I aim to move beyond what Losurdo identifies in Adorno as an "imperialist universalism."[4] This distinction is not meant to dismiss these thinkers entirely; rather, it is a way to clarify their limitations so that their insights can be re-situated within a non-imperialist framework.

Alongside this tradition stands a broad constellation of scholars – such as the Warwick Research Collective (WReC), John Bellamy Foster, Jason W. Moore, Jennifer Wenzel, Gayatri Chakravorty Spivak, David McNally, and Vijay Prashad – whose work occupies prominent positions within Western academia but does not neatly fit the Western Marxist label. A related, and in many ways more decisive list, consists of thinkers and activists mostly working *outside* the dominant institutional structures of ASLE and EASLCE: Benjamin Schwartz, Walter Mignolo, Enrique Dussel, Ngũgĩ wa Thiong'o, Dipesh Chakrabarty, Hamid Dabashi, Wang Ning, and Zhang Longxi, along with figures such as Samir Amin, Édouard Glissant, Arif Dirlik, and Arturo Escobar.

Placed within an ecocritical and literary lens, these thinkers collectively raise the central question guiding this section: How can an explicitly anti-imperialist praxis be integrated into literary criticism? Here, I return to Jennifer Wenzel's provocation in *The Disposition of Nature*: "Reading for the planet? How nonsensical is it to think that reading might help 'save the earth'?"[5]

[4] Losurdo 2024, p. 116.
[5] Wenzel 2020, p. 1.

The question points precisely to the need for a criticism grounded not only in theory, but in material, political, and planetary struggle. With this quote, I will end this introduction and now move on to further explain my proposal of a *dirty dialectics,* to overcome these contradictions, as a method that rejects purity and embraces the messy entanglement of literature, globalisation, ecology, class, and empire.

2. *Dirty Dialectics and the Critique of Purity*

As Marx famously observed

> Capital comes into the world dripping from head to toe, from every pore, with blood and dirt… [it's] an enchanted, perverted, topsy-turvy world, in which Monsieur le Capital and Madame la Terre do their ghost-walking as social characters and at the same time directly as mere things. [6]

This project situates itself within that long tradition of Marxist critique. While drawing on Gramsci's insights of *hegemony* and *the subaltern*, I maintain that cultural analysis must remain grounded in material relations.

Here my critique turns toward Adorno's division between a *cold stream* of Marxism – focused on structural analysis – and a *warm stream* that preserves utopian desire. Although a utopian impulse is essential, as Bloch insisted when he declared that «one must believe in the principle of hope; a Marxist has no right to be a pessimist»[7] such hope cannot replace concrete attention to imperial structures and global struggles. Adorno's privileging of the warm stream often abstracts political imagination into an aesthetic register, leaving anti-imperialist movements, particularly those outside the Euro-American sphere, outside the frame of theoretical concern. This, I argue, is a central shortcoming of the Western Marxist tradition.

Indeed, it is precisely this imbalance that has contributed to the emergence of a post-Marxist orientation which, in practice, resembles a *pre-Marxist* return to idealism – disconnected from the materialist

[6] Wenzel 2020, p. 64.
[7] FSVV Tübingen 2008.

clarity Engels articulated in *Socialism: Utopian and Scientific* (1880). An ecological critique adequate to the present must integrate both currents: a recognition of hope without romanticism, and a commitment to material analysis without fatalism. Yet the hierarchical valuation implied in Adorno's "cold vs. warm" dichotomy ultimately reproduces an imperial imperative – assigning moral purity to certain theoretical modes while displacing the messy, material struggles of anti-imperial movements. This leads directly into the next issue: the persistence of a *purity fetish* within ecocritical discourse.

The origin of this term leads us to Brazilian Marxist Jones Manoel, who captures a persistent weakness in Western Marxism in his 2020 article *Western Marxism Loves Purity and Martyrdom, But Not Real Revolution*. The term *purity fetish* was then further developed by Carlos L. Garrido in his 2023 book, *The Purity Fetish and the Crisis of Western Marxism.* In his article, Jones Manoel explicitly says that one of the main issues that has also led me to unfold this attempt at developing a theory of *dirty dialectics*, *«Western Marxism has taken a historic distance from the concrete experiences of socialist transition in the Soviet Union, China, Viet Nam, and Cuba.»*[8] In this sense, *dirty dialectics* as well rejects the *purity fetish* that isolates theory and remains uncontaminated by practice. Ecocriticism, and world literature as well, in this view, cannot remain at the level of moral appeal; it must descend into the mud of production, exploitation, and resistance.

3. *World Literature as Imperial Formation*

Jennifer Wenzel warns in *The Disposition of Nature* that «the tragedy of Orientalism repeats as the farce of World Literature».[9] She argues that World Literature emerged from the Western bourgeoisie's drive to create a global market, yet presents itself as neutral, often masking its imperial entanglements. While my focus remains on ecocriticism rather than World Literature, I follow Wenzel in attempting to bridge Wallersteinian world-systems theory with ecocritical thought as a way to escape the "gardening" problem and become a discipline that risks

[8] Manuel 2020.
[9] Wenzel 2020, p. 7.

transforming "a world-system that mistakes itself for the world."[10] Literature, used as a tool or weapon, can awaken those in the imperial core to the injustices their system perpetuates. If principles like "human rights" and "democracy" were genuine, we would critically examine our own system's corruption and how it is entangled in violations of these values abroad. Gramsci's insights remind us that American cultural hegemony numbs public awareness, with media, literature, and the arts reinforcing a system tied to the military-industrial complex – the world's largest polluter. Shouldn't this be a central concern to ecocriticism? Comparative literature, including ecocriticism and world literature, risks reproducing hierarchies it claims to transcend unless it integrates economic awareness, as suggested by Moretti's *distant reading* and Spivak's *planetarity*.

4. *Marxian Ecology: Forgotten Histories*

During her presentation at the conference in Venice that this publication is the result of, Nancy Fraser made a call for action, and that was: *what we lack, that the right wing has, is a story.*

I respond that the story exists; it has simply been suppressed by a hegemonic academic system, as Gabriel Rockhill has recently highlighted[11]. John Bellamy Foster reminds us that ecological thinking predates late-twentieth-century environmentalism: revolutionary Marxian ecology emerged in the USSR of the 1920s–30s, with figures like Bukharin, Vavilov, and Boris Hessen developing a dialectic of socialism and ecology largely absent from the Anglophone canon. [12] Ecology itself, Foster also tells us, was coined by Ernst Haeckel in 1866, grew alongside critiques of industrial capitalism, only entering popular discourse in the mid-twentieth century. These historical foundations are crucial if we are to take Fraser's call seriously and construct a narrative framing our struggle as one for planetary rejuvenation. This sets the stage for my analysis of Azfar Hussain's poem, which provocatively challenges our curated self-perceptions amid a culture that numbs and repackages meaning.

[10] Wenzel 2020, p. 28.
[11] The Deprogram, 21. Nov 2025.
[12] Foster 2020, p. 25.

5. *Literature, Cash, and Capital*

In this brilliant microcantos by Bangladeshi professor and poet Azfar Hussain's *Dhaka and Dirty Dialectics* he both dramatizes the commodification of culture and history, while also throwing a sharp critique at many perceived universalities that exist within this unipolar world, and he does so with biting poetry. Just listen to his opening line: "Forgive me if my accent keeps falling on the wrong syllable."[13]

This sentence holds much weight within it; it carries so much trauma and tells an entire history of colonisation and domination. Forgive me for not sounding exactly like you, I am yet to master the tongue of my overlord; that is basically what he is saying. Next paragraph, he goes on apologizing,

> Forgive me if my black poem invites crude prose and even coarse statistics. And forgive me if I blurt out the dark unsayables in the middle of your *darbari* music or mess around with your late-night discourses on Zen. And forgive me if I miss cues and clues from your City Corporation or Stock Exchange for my reality check.[14]

What we see here is a clear ironic commentary on what we know as cultural appropriation. At the same time, it is also a call back to colonialism, where the role of the colonialists in their so-called "civilising missions" came from putting this utmost importance on the Stock Exchange and all the exploitative international conglomerates it has laid the ground for. But now they are dressed in commodified spiritualism. And he almost abolishes himself inside this web by implying that any words uttered in his own mother tongue simply must be identified as *unsayables* and nothing more. And is he wrong? Is this not the dominant attitude in the unipolar world? He continues in the next microcanto

> I swear by my dark-skinned mother's milk that Dhaka has three-thousand-and-three-hundred mysterious names, and that everyone from Ginsberg to Günter Grass has misspelled Dhaka at least once.[15]

[13] Hussain 2013, Microcanto I.
[14] Hussain 2013, Microcanto I.
[15] Hussain 2013, Microcanto II.

The literary references that we are all brought up knowing, and they don't even know the capital of Bangladesh, why should they? But the important thing about this stanza is the way in which he implies that there is a whole hidden world of history and linguistic depth that this language and geography carry within it. Meanwhile, these greatest of authors can't even spell its simplest form, which I read as his way of saying they have no earthly way of understanding the complexity that this culture carries within it. Which, in many ways, is also one of the core issues of contemporary World Literature; it all exists under this umbrella of a *universalising imperialism*.

I swear by my black father's blood that everyone – from the Sena Kings of Vikrampur and the rulers of Sonargaon, to the Turks and the Pathans, to the Mughals and the British and the Pakistani – sweated the dark details of your three-thousand-and-three-hundred contours and curves, never figuring out who the hell you were, Dhaka, although many of them sized you up, and even measured your black chest, waist, hips, and height.[16]

What we see here is again a deep historical spiral of interlinking cultures and histories, and of course, the final part here refers to the British colonial regime measuring their colonial subjects to put a price on their heads. None of them being worth even the price of a bullet.

"When they say "love loves to love love," I say *cash cashes to cash cash*.

Does my refrain bother your Board of City Directors like a stubborn itch in the ass?"[17]

Here "cash" becomes the refrain for a world where even love and art circulate as exchangeable signs. Which, in its most frightening way, is very recognisable. It is a hint that tries to uncover the illusions we have around the pop culture that we all embedded in and brought up to love and appreciate, even adore on levels beyond the ways we used to treat divine idols. But all of this, is simply just a front for the big cigars in the backroom, much like we see it in Peter Watkins' 1967 movie *Privilege.* He continues

> Nor do they give a hoot about how well those *chamchas* bark English to amuse their foreign bosses or buddies. And meanwhile flashing their white teeth, the World Bank and the IMF mispronounce your

[16] Hussain 2013, Microcanto II.
[17] Hussain 2013, Microcanto III.

> name, maldefine your needs, make up your contracts, and then produce a long check-list of do's and don'ts.[18]

What we see here is the most blatant uncovering of what goes on inside the economic monster run by the World Bank and the IMF, all the checklists of what these so-called post-colonial subjects are allowed and not allowed, like, for example, nationalising certain industries.

> It's cool and funky for these American boys to read Mao's red books and sport Che's face on their T-shirts and even tattoo *Malcom* [sic] on their white skin. And they think revolution as a violent phenomenon begins with yoking together Marley and marijuana. And they discuss the current state of the proletarian movement over popcorn, Pepsi, and pizza. And they debate for hours the fine points of dialectics at Starbucks.[19]

Celebrating in coffee shops, discussion groups, and festival circuits, risks becoming another node in this commodity chain. Where everything is just a construction inside this endless loop of a matrix, where any hope of real resistance has been eradicated by the root. A truly planetary ecocriticism must provide an alternative narrative of emancipation that exposes the cash nexus while mobilizing hope and using as sharp a critique of our own circus as Azfar Hussain does in this poem. What I love about this poem is the way in which it encapsulates all the inner workings of this capitalist world system; it holds up a perfect mirror that actually makes us feel a bit uncomfortable, because it uncovers our deepest thoughts and insecurities. And this, in many ways, is exactly what I call for with this *dirty dialectics.* I do not care much for the way in which we have come to believe that eroticism is some aesthetic value of the left; this is a distortion that has been constructed since the French Revolution, and it's time to see through its obvious connections to the *ancient regime* and its ways to lure us into patterns of corruptibility. It is this tendency that blinds us to the real nature of our system, falsely believing that this somehow is what divides the left and right, when it is simply a question of bringing the same practices into the exoteric(left) or keeping them esoteric(right); the foundation is the same. A recent book by

[18] Hussain 2013, Microcanto V.
[19] Hussain 2013, Microcanto VII.

João Romeiro Hermeto tries to uncover the deeper reality behind the quote that has often been associated with Mark Fisher, but it actually originated from Fredric Jameson where he says

> [i]t seems to be easier for us today to imagine the thoroughgoing deterioration of the earth and of nature than the breakdown of late capitalism; perhaps that is due to some weakness in our imaginations.[20]

This is, in many ways, a more optimistic turn than how this quote is normally referred to, because I believe that this element of the imagination might be exactly what will manage to lift us out. Yes, there is definitely a weakness in our imagination at the current moment, but I do not believe this to be some natural disposition. In fact, Romeiro Hermeto breaks down this exact problem and its origin in *Phenomenology of the Capitalist Eternisation,* in which he writes

> capitalist power over both subjective and objective conditions fosters a continuous *destruction of reason*, thus yielding *historical amnesia*, which becomes a necessary condition for the *transformation of the collective memory*, thus enabling a total *cultural reshape.* As a result, social struggles and polarizations are subjected to conform to capitalist contradictions, thus enabling a capitalist "life extension"; in other words, this allows the capitalist elites to further cling to their power over society and nature.[21]

In continuation of Azfar's poem and my point about the *eroticism* of culture as a tool to keep us locked in this amnesia, this quote brings forth the deeper critique we need to fathom, regarding the system we are embedded in. It reminds me of the famous *Parable of the Sunfish*, where the story goes that the Swiss biologist Louis Agassiz asked a student to describe a fish and then provides first its common name, then its Latin given name, but the professor is not satisfied with this answer. After multiple attempts at describing this fish, the student takes it home with him. After returning a few weeks later, the fish is in a state of rot and decomposition, but as the moral of the story goes: «he knew something about it».[22] In many ways, this is exactly the way

[20] Hermeto 2025, pp. 17-18.
[21] Hermeto 2025, pp. 9-10.
[22] Encyclopaedia Wikipedia 2025.

that I want our ecocriticism to uncover the true nature of the system we live under, and I see Azfar Hussain's poem as a great example of this. To truly escape this *Capitalist Eternisation* we need to imagine further than its scope allows, and to be able to do that, we need to first uncover its true nature, and to do that, things must become *dirty*.

6. *Conclusion: Toward a Planetary, Multipolar Anti-Imperialist Ecocriticism*

The task, then, is to craft a counter-narrative: a planetary story of ecology and liberation that is historical, materialist, and insurgent. Spivak's *planetarity* can be re-read through the lens of Marx's metabolic rift as an invitation to think scales beyond the nation, while resisting the flattening logic of capital and maintaining a focus on supporting national liberation struggles. Such a project also requires a multi-polar perspective attentive to the rise of BRICS+ and the shifting geographies of literary production.

"Because Goethe has no real critique of capitalism, Cheah argues, World Literature offers little more than an uncritical, liberal reflection of global capitalism, vitiating its «worldly force. . . in re- lation to the world globalization creates» (2016, 43, 28). The bourgeois liberal idealization of the market as a site of free exchange – "the all-too-common assumption of a 'level playing field'" (WReC 2015, 22) – posits a world that's flat and frictionless, *innocent and equal*; anything distasteful or violent is dubbed an externality and dispatched and quarantined elsewhere. Marx and Engels, by contrast, not only understood world literature (in Mufti's phrase) as a «product of the Western European bourgeoisie's drive to create a world market»; they understood that drive to be transforming the colonized world, in Marx's phrase, into a heap of ruins. World literature is another good thing that comes at great cost to someone else.[23]

While this remains the status quo, ecocriticism will remain a form of "gardening" unless it confronts the intertwined realities of capitalism, imperialism, and ecological crisis.

A *dirty dialectics* of ecocriticism, therefore calls for:

– Historical analysis of capitalism's ecological limits, through an anti-imperialist lens.

[23] Wenzel 2020, p. 25.

– Engagement with revolutionary traditions of Marxian ecology.
– A refusal of the false innocence of "green" aesthetics.
– A complete denial of the *purity fetish* where all attempts at change are demoralised until they can be turned into commodities for profits.
– A style of confessional honesty that truly uncovers the deeper, dirtier inner workings of our current system.

Only by embracing the mess of history – its mud as well as its utopian flashes – can literary studies contribute to the planetary struggles that define the Anthropocene.

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Ecosocialism, degrowth, and agri-food systems: a crucial missing link?

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Abstract

The interconnected crises of climate change, biodiversity loss, and global social inequality have been theorised as direct consequences of capitalist dynamics of accumulation, labour and nature appropriation, and economic growth. Despite their diverse historical traditions and diagnoses about the causes and solutions of these crises, different post-capitalist and anticapitalist schools of thought have started a dialogue to create the intellectual foundations of a socio-ecological transformation towards social justice, improved human wellbeing, and ecological sustainability. This contribution assesses the state of the art in the discussion between two of these schools, i.e., ecosocialism and degrowth, with a specific focus on agri-food systems. Although socialist and Marxist debates have historically included food and agriculture, and degrowth research has recently expanded from local case studies to broad agri-food systems, the dialogue between both schools seems to be currently missing a specific focus on agri-food systems. This contribution proposes to start the conversation by considering how the concept of 'cheap food' (e.g., the capitalist process of cheapening food prices to ensure a larger appropriation of labour in the world-ecology) could help degrowth literature to engage with the political economy of agri-food systems. By providing a robust explanation of the role of food production in a general theory of capital accumulation and growth, this approach can help degrowth-oriented researchers and practitioners to better understand the implications of food system transformations for broader socio-ecological transformations. Finally, these insights point in the direction of exploring food system transformation strategies based on food decommodification and food sovereignty.

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Keywords: socio-ecological transformations, degrowth, ecosocialism, agri-food systems, cheap food

1. *Introduction*

The interconnected crises of climate change, biodiversity loss, and global social inequality have been theorised as direct consequences of capitalist dynamics of accumulation, labour and nature appropriation, and economic growth in an unevenly distributed world-economy.[1] As a response, and despite their diverse historical traditions and diagnoses about the causes and solutions of these crises, some post-capitalist and anticapitalist schools of thought interested in socio-ecological systems, i.e., ecosocialism and degrowth, have started a dialogue to create the intellectual foundations of a socio-ecological transformation towards social justice, improved human wellbeing, and ecological sustainability.[2] This article assesses the state of the art in this discussion through a scoping literature review (see Annex) with a specific focus on agri-food systems. Because of their high environmental and social impact, as well as their central cultural and material position in human communities and wellbeing, food systems have received much attention as an object of study.[3] Moreover, their unsustainable condition (e.g., high contribution to climate change and biodiversity loss; simultaneous increase in food insecurity and obesity; destruction of food cultures) has also been explained as a direct result of political-economic imbalances in global capitalism and the subordination of fairness and sustainability to profit accumulation.[4] Despite this, the dialogue between ecosocialism and degrowth seems to be bypassing agri-food systems as a central topic of discussion (see further sections). I argue that a focus on food and agriculture should be included in the discussion because of the central role of food systems transformations in a broad socio-ecological sustainability transformation. After showing the results of the literature

[1] Harvey 2003; Hickel, Kallis 2020; Patel, Moore 2018.
[2] Bonaiuti et al. 2024; Foster 2023; Kallis 2019; Saito 2023.
[3] Gaitán-Cremaschi et al. 2018; Stefanovic et al. 2020; Zurek et al. 2022.
[4] Ceddia et al. 2024; De Schutter 2017; McGreevy et al. 2022.

review, I explore recent degrowth literature focused on agri-food systems and summarise the main research gaps they identify. Finally, to start the academic conversation between degrowth and ecosocialism regarding agri-food systems, I propose to consider how the concept of 'cheap food' (e.g., the capitalist process of cheapening food prices to ensure a larger appropriation of labour in the world-ecology) could help degrowth literature to better engage with the political economy of agri-food systems.

2. *Ecosocialism, degrowth, and agri-food systems*

The results of the scoping literature review show that the academic dialogue of ecosocialism and degrowth is very recent and barely nascent (See Figures 1, 2, and 3). Apart from the low number of studies which mention the concepts *degrowth AND socialism* (N=34), *degrowth AND ecosocialism* (N=17), and *degrowth AND Marxism* (N=24) in Scopus, most of these documents have been published from 2019 onwards. The peak in 2019 in queries 1 and 2 corresponds with the publication of a Symposium on 'Socialism and Degrowth' in the *Capitalism, Nature, Socialism* journal and its follow-ups. Regarding agri-food systems, just two documents mention the words 'food' or 'agriculture' in their titles, abstracts, or keywords. One of them is included in the review in next section.[5] The other one mentions a transformation of agriculture to 'agroecologies' as part of a broader ecosocialist perspective on Gaia 2.0.[6]

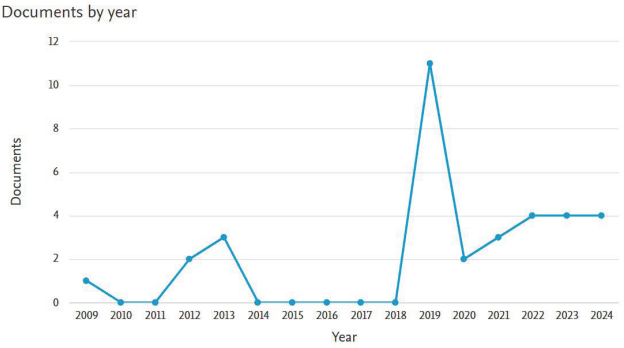

Figure 1: Yearly distribution of documents extracted with search query "degrowth AND socialism"

[5] Gerber 2020.
[6] Schwartzman 2020.

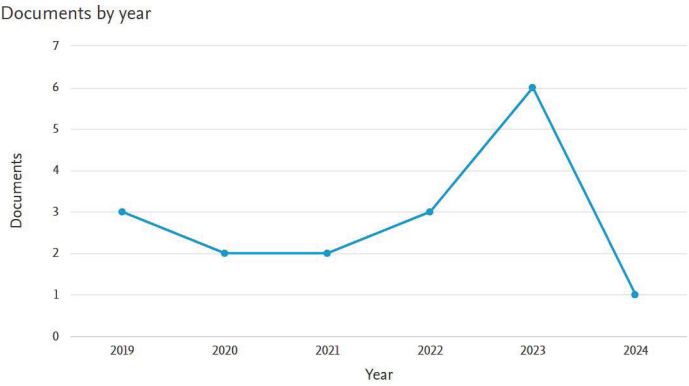

Figure 2: Yearly distribution of documents extracted with search query "degrowth AND ecosocialism"

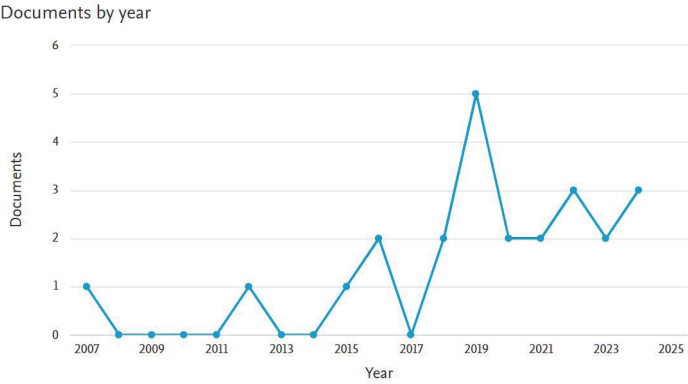

Figure 3: Yearly distribution of documents extracted with search query "degrowth AND Marxism"

To strengthen the analysis, I reviewed the articles from two recent special issues of the Monthly Review (July-August 2023, Volume 75, Number 3) and *Quaderni della Decrescita* (Bonaiuti et al., 2024) journals dedicated to ecosocialism and degrowth, and degrowth and Marxism, respectively. None of them included any article specifically dedicated to food and agriculture topics. The few times that food and agriculture were mentioned was in the context of broader enumera-

tions of topics and sectors that are relevant to address, accounts of alternative agriculture and food initiatives and practices (e.g., community supported agriculture, agroecology, regenerative agriculture), or secondary historical explanations of agrarian change (e.g., the agrarian question, social metabolism, the metabolic rift). Based on these results, I can affirm that agri-food systems have not yet emerged as a topic of interest in the dialogue between degrowth and ecosocialism. Moreover, I argue that the current unsustainability pathways of food systems and its centrality in the material and cultural reality of human communities requires specific attention being put on the topic. To do that, in the next section I start by briefly reviewing recent literature on degrowth and agri-food systems to summarise the main gaps and future research venues they identify and reflect upon how it could be enriched by including insights from ecosocialist and eco-Marxist analyses[7].

3. *Degrowth and agri-food systems: an emerging field*

The topic of agri-food systems has only recently emerged within degrowth research. Although case-study investigations into small-scale food and agricultural initiatives (e.g., community supported agriculture, food sharing, food buyers' groups, agroecological farming) and socio-metabolic studies of agriculture abound, broader reflections about food systems transformations have been largely absent.[8] Considering this, Scheidel et al.

have argued that "[a] degrowth perspective in agriculture and food systems considers pathways to lower resource use, while seeking alternative governance forms capable of addressing social concerns of the people working in and depending on the sector". Guerrero Lara et al. (2023) have defined a research agenda for degrowth and agri-food systems based on four main areas where gaps should be covered:

A. *Degrowth conceptualisations*: analysing the implications of the existing diversity of degrowth definitions concerning, e.g., the ecological and material throughput of alternative agri-food initiatives, trade and food policies, applications to the study of food systems.

[7] It could be argued that the scope of the analysis could be the opposite, i.e., starting from reviewing ecosocialist and eco-Marxist literature and reflecting on how degrowth insights could enrich the former two. Furthermore, a complete analysis could include a review of both fields of literature and an analysis of differences, synergies, and a common research agenda.

[8] Guerrero Lara et al., 2023.

B. *Theorisation of transformations towards sustainability*: developing a rigorous explanation of how change towards degrowth comes about by, e.g., learning from critical perspectives within sustainability transitions and transformation scholarship and investigating the multiplicity of agents of change beyond grassroots initiatives.

C. *The political economy of degrowth agri-food systems*: reflecting on how capitalism matters for the political economy of degrowth agri-food systems by, e.g., understanding how to mitigate the risk of capitalist co-optation, how specific capitalist institutions and practices that govern agri-food systems hamper the degrowth transformation, and how a degrowth transformation of agri-food systems could influence broader societal transformations and viceversa.

D. *Rurality and degrowth*: exploring connections to ongoing peasant and food sovereignty studies and better analysing how to implicate rural populations in degrowth and how to reconnect urban and rural livelihoods.

Since socialist and Marxist traditions have historically analysed the capitalist political-economic structures of food and agricultural systems, e.g., Bernstein (2016), McMichael (2021); it seems clear that ecosocialist and eco-Marxist studies could inform degrowth research in better engaging with the political economy of degrowth agri-food systems. In fact, the connection between degrowth and Marxist-oriented critical agrarian studies has already been proposed.[9] Gerber (2020) has proposed lines of enquiry for agrarian degrowth, focusing on three main questions:

a. What are the effects of growth and who benefits?

b. What are the limits to (agrarian) economies and how to deal with them?

c. What are the alternatives and who will support them?

Connected to the last question, and to the fourth area of enquiry proposed by Guerrero-Lara et al. (2023), Pixová et al. (2024) have explored the potential alliance between degrowth and food sovereignty movements. Although both movements share commitments to social-ecological transformation, democracy, and the flourishing of human and non-human life, they identify barriers that could jeopardise their convergence, e.g., differences in the nature of the movements regarding their identities, experiences, and spatial distribution, lack of resources, etc.

[9] Gerber 2020; Scheidel et al. 2021.

Once identified the gaps and future venues of degrowth research about agri-food systems, in the following concluding section I propose to reflect upon a concept proposed by some eco-Marxist contributors, i.e., 'cheap food'[10], to engage with some of the abovementioned research venues.

4. *'Cheap food' in the capitalist world-ecology: a new frontier for degrowth research in agri-food systems*

Patel and Moore (2018) introduce the concept of 'cheap food' as a part of a broader historical socio-ecological theory of capitalism. They see capitalism not just as a socio-economic system but as a world-ecology that has co-evolved with natural and non-natural elements in an endless process of accumulation though the spatial expansion and conquest of new frontiers, i.e., sites where new sets of socio-ecological relations give birth to diverse strategies of appropriation of human and non-human labour. As a core characteristic of this process, Patel and Moore argue that there has been a process of 'cheapening' of seven crucial 'things': nature, money, work, care, food, energy, and lives. Cheapening must not be understood as a synonym of 'lowering prices', but as:

> [...] a strategy, a practice, a violence that mobilizes all kinds of work – human and animal, botanical and geological – with as little compensation as possible. […] a process through which capitalism transmutes these undenominated relationships of life making into circuits of production and consumption, in which these relations come to have as low a price as possible.[11]

Following classic political-economy analyses, the authors argue that the transformations of food systems were a requisite for the development of capitalism (i.e., growing urbanisation and industrial work), since without food surplus, there is no work outside of agriculture. 'Cheap food' refers to 'more calories produced with less average labour time in the commodity system'. In the words of Patel and Moore, the 'cheap food' model worked like this:

[10] Patel, Moore 2018. The concept of 'cheap food' was introduced by Jason W. Moore in previous work, e.g., Moore 2010, 2015; and in his *magnus opera* 'Capitalism in the web of life' (2015).

[11] Patel, Moore 2018, p. 33.

> Capitalism's agricultural revolutions provided cheap food, which lowered the minimum-wage threshold: workers could be paid less and not starve. This in turn reduced employers' wage bills as the scale of proletarianization increased, allowing the rate of exploitation to rise. Accumulated capital could continue to grow only insofar as a rising food surplus underwrote "cheap" workers.[12]

Therefore, the creation of food as a cheap commodity can be seen as a condition for an increased appropriation of cheap labour, which at the same time is a condition for the appropriation of cheap nature. Following the historical analysis, once the limits of agricultural production are reached, capitalism required expansion towards further frontiers through conquest and imperialism. This expansion has transformed the global landscape, e.g., enclosures, land-grabs, monocultures, pesticides and fertilisers in the Green Revolution, and has had enormous environmental and social consequences. However, according to the authors, the regime of 'cheap food' might be entering a crisis: the possibilities for further expansion are shrinking, while the latest productivity-enhancing developments (e.g., through biotechnology) seem not enough to increase the rates of accumulation.

Patel and Moore's theory provides a robust explanation of the role of food production in a general theory of capitalist accumulation and growth. I argue that this approach could help degrowth research in agri-food systems in advancing at least three of the future research venues mentioned in the previous section. First, regarding the theorisation of agri-food systems degrowth transformations, the 'cheap food' theory can help to reflect upon how a degrowth transformation of agri-food systems interacts with transformations in other sub-systems and broader societal transformations. E.g., a reduction in working hours and a further decommodification of labour, as proposed by degrowth scholars, could reduce the demands for cheap calories and facilitate a transition from industrial monoculture agriculture towards agroecology. Moreover, the decommodification of food through the development of food-as-a-commons and food-as-a-human-right initiatives, studied by degrowth scholars, could allow a reduction in working hours. Furthermore, these realisations could help develop a rigorous explanation of how change towards degrowth comes about, i.e., a degrowth theory of change.

[12] Moore 2018 p. 150.

Second, the theory of 'cheap food' clearly shows how capitalism matters for the political economy of degrowth agri-food systems. By analysing specific processes of expansion of capitalist frontiers in localised geographical and spatial contexts as an attempt to ensure the provisioning of cheap food, degrowth researchers can identify capitalist institutions and practices that hamper the degrowth transformation and reflect upon how to tackle them.

Third, Patel and Moore's theory can be used to identify the role of rural areas (mainly in the Global South) in a capitalist economy as frontiers where the appropriation of cheap nature and labour serves to create 'cheap food' at the expense of rural livelihoods. This entry point might help degrowth researchers and practitioners to explore connections with peasant and food sovereignty movements starting from a common diagnose, which could also help to understand how to implicate rural populations in degrowth and how to reconnect urban and rural livelihoods, i.e., by deconstructing 'cheap food' capitalist relations.

5. *Conclusion*

In the light of the above, the concept of 'cheap food' could help degrowth scholarship focused on agri-food systems to better theorise degrowth agri-food systems transformations, engage with the political economy of agri-food systems, and explore ways to connect with peasant and food sovereignty movements in rural areas. However, this was just a modest example of how a dialogue between ecosocialism and degrowth with a specific focus on agri-food systems could be beneficial to improve their broader debates about socio-ecological transformations. Further explorations could engage in more systematic and rigorous analysis of both fields of literature, starting with clearer definitions of what is degrowth research and what is ecosocialist and eco-Marxist research. Moreover, future research could include other fields of literature into the analyses, e.g., food systems transformations, ecofeminism, sustainability transformations; to try to identify potential synergies and further cross-fertilisation. To conclude, Patel and Moore's theory informs degrowth and ecosocialism in a final way: by pointing at the existing crisis of the capitalist regime of 'cheap food'. Times of crisis are also times of opportunity and transformation. There is not a better moment than now for degrowthers and ecosocialists to start talking about food.

6. *Methodological notes*

For the scoping literature review, I used the search engine of the Scopus Database (title, abstract, keywords; results in English; until 2024). Search queries:

– socialism AND degrowth → 34 results, 28 from 2019-2024
– socialism AND degrowth AND food → 1 result
– socialism AND degrowth AND agriculture → 0 results
– marxism AND degrowth → 24 results
– marxism AND degrowth AND food → 0 results
– marxism AND degrowth AND agriculture → 0 results
– ecosocialism AND degrowth → 17 results, all from 2019-2024
– ecosocialism AND degrowth AND food → 0 results
– ecosocialism AND degrowth AND agriculture → 1 results

Additionally, I reviewed two recent Special Issues about Degrowth and Socialism [no specific article addressing agriculture or food-related topics]:

– Planned Degrowth: Ecosocialism and Sustainable Human Development – *Monthly Review* | July-August 2023 (Volume 75, Number 3)

Introduction.
FOOD → 9 times (references, food sovereignty, food security, food redistribution).
AGRICULTURE → 6 times (historical analysis).
Degrowth and Socialism: Notes on Some Critical Junctures.
FOOD → 4 times.
AGRICULTURE → 0 times.
Degrowth and Technology.
FOOD → 1
AGRICULTURE → 0
Degrowing China.
FOOD → 3
AGRICULTURE → 1
Communal Alternative in Venezuela.
FOOD → 7 (cheap food, and case studies)
AGRICULTURE → 1
Planning Degrowth.
FOOD → 2
AGRICULTURE → 0

– Decrescita e marxismo: Dialogo possibile e necessario. *Quaderni della decrescita.* Settembre / Dicembre 2024 (Anno 1, n.3)

Search 'FOOD' (*cibo*) → 23 results, three type of mentions:

Connected to degrowth practices such as community supported agriculture, food buyer groups, etc.

In enumerations of topics of interest, sectors to address, or fields that would benefit from degrowth/ecososcialist transformations.

In the references of the articles.

Search 'AGRICULTURE' (*agricoltura*) 18 results.

Social metabolism and metabolic rift (mentioned, not in depth).

Organic agriculture, regenerative agriculture, etc.

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Ecological Marxism: A Critique of Ecology

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Abstract

This work aims to demonstrate that there is an ecological theory of Marx that proceeds as a set of theses formulated in opposition to the dual exploitation of man and nature and posits concern for these two orders of reality as a fundamental condition for a more sustainable and livable future humanity in its multiple relationships with the non-human. This approach also anticipates contemporary critiques of dominant ecological rationality, in that it conceives of the sustainability of human society as generating human action, which is the most fundamental obstacle to it at the present time.

Thus, Marx's environmentalism considers the response to the ecological threat to be revealed and realized dialectically in the process of the complete development of the current orientation of human action that is its cause, which, according to our ordinary representations, is unacceptable. This requires that we pay more attention to it, taking into account the question of its contribution to the current struggle against the ecological threat.

This contribution therefore suggests a different way of understanding the broader issue of ecology, approaching it without losing sight of the relationships that shape it and for which it could be a new tool. This approach, which aims to promote Marx's ecological approach, reveals the dominant orientations of ecological rationality as factories of ecological vulnerabilities, supports for capital accumulation, and dependent development.

Bio: Sylvestre Ngouo Ndadjo holds a PhD in Philosophy. He is a specialist in Karl Marx and Samir Amin, his work seeks to reexamine Marxist theory on socialist transition in light of contemporary technological changes and

the logic of dependent development that the prevailing ecological rationality currently imposes on developing countries under the guise of international aid and assistance for sustainable development efforts by weaker nations.

Keywords: Marxist Environmentalism; Ecological Critique of Capitalism; Human-Nature Metabolism; Explitation of Nature and Labor; Circular Economy and Profit Theory

1. *Introduction*

Talking about Marx as an environmentalist still surprises people today, even though there are some great works that really show this idea is true (see Foster J.B.). And the idea of Marx being critical of ecology or the dominant ecological rationality is even more surprising. If we want to take this further, we could say, echoing Hans Jonas, that Marx is anti-ecological. However, by Jonas's own admission, Marx poses the ecological question par excellence in the most objective and relevant way: concern for the future based on the repercussions of our current actions as a fundamental principle of all human action and intellectual endeavor. What is therefore anti-ecological in Marx is his relationship with the ethics of hope, with the idea of envisaging a more sustainable future for humanity based on a model of progress and prosperity that compromises the chances of the future.

To consider overcoming human exploitation on the basis of technological progress and the ethics of hope that underlies it is in itself anti-ecological. Yet this is what Marx does, and it is precisely the basis of what we consider to be his ecological theory. When we talk about Marx's environmentalism, we are referring to what appears to make his thinking a non-ecological, even anti-ecological, theory. The reduction of the fundamental question of his thinking to the human and the possibility thus offered to man to become truly human by means of the submission of the non-human to his needs is in reality what makes Marx not only an ecologist, but above all an early critic of contemporary environmentalism.

Our aim is therefore to demonstrate that what appears to make Marx a non-ecological, even anti-ecological thinker is precisely what is ecological and critical of ecology in his thinking.

2. *Marx and the non-human*

When reflecting on the idea of Marxist environmentalism, it is advisable to start with the answer to this simple question: did Marx show any concern or interest in any form of nature other than that of man and his dignity? The question only really arises if we separate humans from nature and the non-human in general. In Marx's view, this separation only occurs in the current form of society, and this is precisely what explains the alienation not only of humans, but also of nature and the non-human in general. For Marx, this separation translates into a breakdown in the harmonious organic exchange between humans and their external essence: non-human nature. It occurs as a result of the emergence of an irrational, or rather non-collective, form of human reproduction. By harmonious, we therefore mean rational and collective.

Man, insofar as he is truly human, is nature, and nature, insofar as it is natural, is human. Natural nature exists only in its domestication by man, of whom it is the external essence, and man is only human by appropriating this external essence (Marx K., 1972, pp. 79-149). Nature, the external essence of man, reveals itself to him as a resistance that he must confront in order to attain authentic existence. Thus, opposition to external nature becomes the path to humanity and naturalness and/or the humanization of nature. These exist, can exist, and reproduce objectively only in this opposition, which Marx technically calls the organic exchange between man and nature, independently of the social form of production (Marx K., 1968c, pp. 2049-2050).

Man must therefore constantly oppose nature in order to be truly human, and nature must be natural. This opposition is twofold: destructive and productive-reproductive. It destroys when production ceases to be collective and rationally organized, and produces and reproduces both man and his external essence, nature, in the case of rational, collective organization of production. This means in reality that natural nature itself exists only in the transformative action of man, and that ecosystems, environments, and particular living conditions are the products of history, that of human activity and the disturbances it necessarily induces (Marx, 1972, op. cit.). These disturbances do not always occur where and when the action that causes them takes place. The fact that they occur elsewhere, in an environment different from the one in which they originate, is not in itself

an expression of ecological injustice characteristic of socio-ecological cost transfers. In reality, they occur as expressions of a certain natural order and, as such, as resistance or hostility that nature opposes to humans in a given living environment. Thus, they encourage humans to take transformative action through which they break out of their animal shell, reinvent themselves, and reinvent their environment to make it more conducive to their well-being. Marx provides the elements for an objective critique of the dominant theory of ecological justice today.

What we are talking about here is actually a qualitative transformation of both humans and their immediate environment. Improving the quality of human life is therefore inseparable from improving the quality of their environment, their surroundings, and their immediate living conditions – in other words, what we now call ecological action. This is part of the natural order of things. Therefore, by his very existence as a human being, a being of flesh, bone, and needs, man is a protector of nature, which he destroys at the same time through his protective actions. His struggle for survival is thus a struggle for the qualitative transformation of nature, of the non-human in general, decoupled from its destruction. It is in this contradiction that the natural order emerges, explaining the interactions between different environments and corners of the world, and the transfer of the costs of human transformative action from one place on the globe to another.

It is therefore as an effort to resist the hostilities that nature opposes him, which he must tame in order to be human, that man's transformative action takes on an ecological nature. These hostilities thus act as stimulants for the ecological actions demanded by the requirements and needs of the immediate ecological environment in which man lives, as well as by the necessities of his adaptation to that environment (Marx K., 1968abc, 1972, 2011).

Marx considers concern for human dignity and for the dignity of non-human nature to be inseparable in this regard. It is in this context that criticism of the exploitation of humans also reveals itself to be criticism of the exploitation of nature. But even here, it is also clear that Marx is not indifferent to the condition of non-human nature. He explicitly denounces this double exploitation, which he identifies as a capitalist strategy for generating excess profits.

I. Marx's environmentalism revealed by his critique of exploitation

The starting point for Marx's thinking is the assumption that humanity progresses by destroying its two main and only sources of wealth and life: nature and man. This phenomenon, which is initially unconscious, since it relates to the order of nature and the very nature of human activity or action, which cannot do without the exploitation of nature and, necessarily, its destruction (cfr. Marx K., 1968, 2011; Marcuse H., 1968), of its resources, of man and his health, gradually develops into a conscious act, and soon into a strategy of keeping the masses in precarious health, cognitive and, above all, economic conditions, as well as in dependence and slavery, wage slavery and other forms.

Based on this phenomenon, Marx explains the bourgeoisie's indifference to the sanitary horrors produced in the direct spheres of production and the resulting ecological and environmental consequences. He also uses this same basis to explain the ravages of industrial or capitalist agriculture in Scotland and in the European territories exploited by England at the time. The overexploitation of nature through agriculture and agricultural production methods and techniques that sterilize and impoverish the land in the territories under their domination are revealed to be strategies for maintaining their dependence. The capitalist system of exploitation thus finds in the ecological weakening of the environment, expressed here in terms of the sterilization and impoverishment of nature, the most effective mechanism for condemning exploited peoples to the margins of history, so that they can be further exploited. Marx expresses this better by applying this explanation to the condition of workers.

In Section III of Book I of Capital, Marx describes the working conditions in English factories at the time, emphasizing the bourgeoisie's refusal to reduce noise pollution, various forms of pollution, and their impact on workers' health, as strategic mechanisms for degrading working conditions and producing health and ecosystem risks and threats. This working environment constantly generates various threats and risks of pollution, infection, serious illness, neurological disorders, chronic psychological crises, and even death.

The exposure of workers to a hostile working environment that is conducive to the production of vulnerabilities, various risks, and crises, makes it possible to attack their vital and cognitive functions, thereby weakening them, keeping them under control, and, through

these mechanisms, exploiting their lives and health to save money, for the efficiency of the system of surplus value production and the increase in profit rates, repression and exploitation of nature and humans.

Through this mechanism, the capitalist system keeps the working class under control, turning workers' lives and health into a strategy for devaluing labor and saving money in the use of capital. The destruction of the ecosystem of work, of people and their health, of their immediate working and living environment, becomes an effective means of saving money. A worker whose health is fragile and whose working and living conditions are criminally toxic and precarious is a beast of burden doomed to obedience and voluntary sacrifice for his master. He cannot defend his rights either, since his whole life is then devoted to pitying his fate (Marx K., 1968a). Thus, the capitalist system of exploitation

> […] comes to count among the savings in the use of constant capital, and therefore among the means of raising the rate of profit, the waste of the worker's life and health, the debasement of his living conditions.
>
> [In these circumstances ...], overworking a worker, turning him into a beast of burden, is a method of accelerating the valorization of capital, the production of surplus value. This [... strategy] consists of filling cramped and unhealthy rooms with workers, which, in capitalist language, is called saving on premises; piling dangerous goods into these premises and neglecting the means of protection against the risk of accidents; neglecting safety measures in work that is inherently unhealthy or dangerous, such as in mines, etc. Not to mention the absence of any facilities to make the production process humane, pleasant, or even bearable for the worker (Marx K., 1968c, pp. 1476-1477).

According to Marx, domination and overexploitation through precariousness and the creation of risks, threats, and ecological and health crises are among capitalism's most effective tools. It would be wrong to assume that this applies only to the manufacturing environment and large-scale industry. This technique is used in all spheres of social production integrated into capitalist logic, and therefore necessarily in agriculture and in all branches of production where the environment, the immediate means of work and life of the worker are na-

ture and its conditions. Here, capitalist control and overexploitation through the economical use of constant capital directly affects nature and its conditions, and destroys them. The requirement for economy in the use of capital transforms capitalist production into a gigantic instrument of apocalyptic destruction of nature and its resources.

3. *Theory of profit and critique of ecological rationality*

Marx demonstrates that capitalist production pushes humans and nature to constantly exceed their natural production capacities. This tendency is determined and overdetermined by the technical and scientific-technological developments and revolutions that are characteristic of capitalist production. Under the influence of these advances, production accelerates and increases, along with the subsequent intensification of the exploitation of the organic materials that humans work with.

However, the pace at which nature produces, reproduces, and renews these materials cannot keep up with the pace of social production and its demand for resources. Although the production capacity of natural resources cannot be exceeded by population growth, as Malthus and the neo-Malthusians believe, the time required for nature to reproduce and regenerate them is extremely long (Marx, 1968abc & Martinez-Alier, 2014). This leads to their constant scarcity, which influences their prices, affects the pace of social production, slows it down, and very often plunges the system into production crises. To overcome these obstacles, the system resorts to techniques that enable it to multiply and accelerate nature's production capacities, as in agriculture with chemical fertilizers, and today with GMOs. However, these techniques are ecologically harmful. This is precisely the case with techniques for saving capital, the most effective of which are the use and reuse of waste.

Pressure on natural resources is leading to their scarcity, forcing a slowdown in the pace of social production that our overconsumption society cannot afford (Sauvé S. et al., 2016). The result is an obligation to exploit and bleed nature dry until it is completely depleted of all its resources. Correlatively, there is a growing need to reduce the unemployment rates caused by advances in automation in order to avoid social implosion.

These realities combined tend to bring the social production system to a standstill. But with the large-scale production of waste caused by the increasing use of machines, the resulting productivity, the proliferation of production branches or units, and the immediate effect of overconsumption, the conditions for the use and reuse of production and consumption residues as raw materials and/or auxiliaries in new or existing production branches are also developing. As it became difficult to extract resources from nature due to the time required for natural resources to renew and produce, opportunities arose to discover new properties and uses for waste. These conditions included the increasing unavailability of raw materials, coupled with exponential growth in demand and rising prices (Marx, 1968b; Sauvé S., 2016, p. 15, Sinclair-Desgagné B., 2016, pp. 31-32), and the relative increase in the social mass of waste (Marx, op. cit.). The social production system, through its pragmatism, thus creates the conditions for the use, reuse, and replacement of waste in the processes of production and circulation.

These conditions emerge as means of saving on the use of constant capital, the ultimate goal of which is to increase profit margins. They inspire the development of sophisticated production techniques and branches and industries for the treatment and reconditioning of waste for the purpose of increasing profit margins, and have absolutely nothing to do with any concern for the environment or ecology.

Let us refer to the organic composition of capital to better understand this. The total capital C advanced in production with a view to making a profit p consists of a variable part v and a constant part c. In the production process, v, converted back into labor, increases by a surplus value pl or a profit p. It follows that profit, which in its relation to labor or the worker takes the form of surplus value, is produced by the worker, not by C. The final value resulting from production therefore consists of C + pl or c + v + pl. This value is the real cost of the product, although in the capitalists' view it is C that is the cost (Marx, 1968a & b) and pl an additional value that is mysteriously formed on the market (Smith, 2009; Ricardo, 1966). But if pl equals p, the rate of pl' differs from that of p'. The rate of surplus value pl' is determined by the ratio of surplus value to the element that produces it, i.e., pl/v = pl', while the rate of profit p' is calculated by the ratio of surplus value to total capital, i.e., p' = pl/C.

Thus, the rate of p' falls or rises depending on the value of C and pl. If C increases while pl decreases, as is the case with the increasing use of machines, p' will decrease in the same proportion. With surplus value remaining constant, variations in p' can only result from variations in C. In the case that concerns us here, we assume that pl is constant.

From the above, it follows that if we assume, for example, that the savings achieved in converting residues into new products amount to a value X represented here by D, we will have the following new value for p': p' = pl/C-D or p' = pl/ (c+v)-D, where D is the product or value resulting from the revaluation of residues deducted from constant capital c. This deduction affects total capital C and reduces it, hence the increase in p'. The new value of the rate of profit p' after deduction of the value resulting from the reuse or replacement of waste in the process of capital valorization is p' increased by the surplus profit D (Marx, 1968b, pp. 1442-1496).

The methods, techniques, and technologies for recycling, reusing, and extending the useful life of objects, the application of which gives rise to what is now known as the circular economy, are in fact, according to Marx, the result of efforts to increase p' by adding D, which is their sole purpose.

We can therefore see that the emergence of conditions and opportunities for the use and reuse of waste is accompanied by the introduction and development of techniques and technologies for its reconditioning. It also involves the creation of sectors and branches of industry specializing in the implementation of these advances in projects for the recovery, treatment, and conversion of waste into objects that are safe and environmentally sound to use. Their revaluation thus presupposes compliance with and observance of health and environmental measures or precautions. These are revealed under the guise of quality, health, and safety standards, or rather the obligation to revalue waste products for the purpose of increasing profit margins. In this respect, the mechanism described here is circular.

The requirement for recycling, reconditioning, and ecological remediation of products is linked to the nature of developed capitalism and is a vital necessity for it. Its orientation toward ecological propaganda is in itself a deception, the purpose of which is to mask its true functions so that it can operate effectively in the shadows.

With regard to this approach, it is clear that Marx was far ahead of his time. He clearly understood and described in the most objective way what is now considered to be the most advanced ecological technology and the most suited to the need for restraint imposed on us by current circumstances. The only difference is that he insisted that this development is not in itself an ecological technique, but an instrument of profit, of super-profit. But these advances, which have absolutely nothing to do with ecological concerns, are fundamental conditions for a future humanity that is sustainable and sustainable in its relations with the non-human. Here we see Marx's fundamental contribution to the current struggle against the ecological threat, which should be exploited to the full.

4. *Rethinking environmentalism with Marx*

Humans cannot do without exploiting nature or opposing it. In order to exist, reproduce biologically and cognitively, they must constantly oppose nature. It is in this opposition that both the reign of the inhuman, the apocalyptic destruction of the non-human, and the human reign, the respect and preservation of nature outside of man, emerge. This seems like a dramatic paradox, since respect and preservation of the dignity of the different orders of nature follow the same path as their apocalyptic ecological destruction. The sustainability of the non-human and the true humanity of man emerge from their most chaotic destruction.

This thesis may seem completely absurd if one does not pay serious attention to Marx's theory of the socialist overcoming of capitalism. What Marxist orthodoxy has retained from this theory is the workers' revolt, and this is precisely the source of all its difficulties. However, Marx, in his preface to A Contribution to the Critique of Political Economy, provides the key to this transition. This key can be summarized as follows: no social system can be overcome without the development of its material conditions of existence being completely exhausted and without those of the new system emerging within it (Marx, 1972, p. 19).

Marx sets out two radically fundamental conditions for any social transition. These elements constitute the substance of his ecological response to the dual exploitation of humans and nature, or non-hu-

mans. Capitalist society, which must be overcome in the present moment, is based entirely on this exploitation. Its conditions of existence are therefore those of the exploitation of humans and nature.

If we refer to the theory of surplus profit that we analyzed above, we can understand that with the development of the instruments of exploitation, the conditions and possibilities for producing without hemorrhagically exploiting nature and natural resources are gradually emerging. The discovery of techniques for using and reusing residues has ushered in an era of production in which it is now possible to produce using only what already exists. This provides the conditions for production without further exploitation of nature, or rather, without the hemorrhagic exploitation of nature and non-humans in general.

Marx argues that this progress is due to developments within the instruments of capitalist production. These developments are gradually transforming these instruments into sophisticated, extremely efficient means of production, capable of producing without direct human intervention in the sphere of production. At this stage, they represent the accumulation of all human labor since the first act of production, transubstantiated and transformed into science and a system of automatic machinery. In this form, they merely transfer part of this labor into the objects in whose production they are involved. This is precisely the case with fixed capital, sophisticated machines, and above all automation.

According to Marx, the advent of automation marks a decisive stage in the progress of the capitalist mode of production. To understand this, we must remember that capitalism only exists where humans are the main factor of production. Its main and sole raison d'être is the exploitation of humans, of human labor power in the sphere of direct production. Therefore, without the exploitation of man and human labor, there can be no capitalism. Automation, because it excludes humans from direct production and represents a form of production that is carried out solely by and thanks to machines, transforming the labor incorporated into fixed capital into new objects, abolishes capitalism and the exploitation of humans and nature. By pushing the development of its instruments of exploitation to the extreme, it certainly produces the most appalling exploitation, but at the same time it produces the material conditions for its own overcoming, it abolishes human labor, it produces the instruments that make impossible the exploitation of nature and man on which it is based.

The fundamental characteristic of these instruments is that they are the collective labor force, the social individual as Marx says. Consequently, they can only be used collectively, by a collective worker. However, where the means of exploitation are no longer available, this collective worker is the social body, society. This is a society that emerges from capitalism and makes its presence felt within the system itself, where it appears potentially in the forms of collective organization of labor in manufacturing and, above all, in large-scale industry. Socialism thus exists as a possibility, or rather as an abstraction within capitalism, that is, as a reality whose fundamental categories already exist but can only reveal themselves in their concrete forms with the complete development of the whole of which they are a part. The material conditions of its existence, which reveal it as a social totality, only develop with the exhaustion of the conditions of existence of capitalism.

Marx thus provides a serious response in advance to critics such as Jonas. He demonstrates through this theory that utopia is not a dream of a society that we want to bring about through fetishistic mechanisms, but rather a description of a reality whose conditions already exist but are not yet fully developed and can only be realized with the progress of current society and under certain historical circumstances. A society in which the dual exploitation of man and nature ceases is not a child's dream. It is a reality that already exists but is not yet fully developed.

It necessarily follows that social control of production, inspired by the historical progress of the instruments of labor and their transubstantiation into science and technology and into a system of automatic machinery or technology, is the only guarantee of a humanity that reproduces itself in a sustainable manner, preserving and reproducing in a sustainable manner the material, non-human conditions of its own sustainability. Marx therefore understands and demonstrates, well before contemporary theories of sobriety and bioregionalization, that only effective and complete social control of production can put an end to the reign of waste and destruction in all its forms.

Conclusion

We wanted to demonstrate that in his critique of the capitalist mode of production, Marx lays the foundations for an ecological theory that anticipates all contemporary ecological thinking and clearly defines the foundations of a sustainable human society. This is

revealed in his concept of the automated society, where human activity and reproduction coincide with the preservation and sustainable reproduction of the external natural world, or the non-human world in general.

Thus, it seemed to us that contemporary ecological thinking and efforts would progress significantly if sufficient attention were paid to Marx's contribution and if, as he made clear, ecological thinking and efforts were seen as inseparable from the human struggle against the reign of exploitation.

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Half-Earthing and Displacement? A Critical Examination of Edward Wilson's Proposal

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Abstract

This paper critically examines Edward Wilson's Half-Earth theory, a radical and increasingly influential proposal advocating for designating half of the Earth as interconnected protected areas to combat biodiversity loss and ensure human survival. I argue that the feasibility of this proposal is highly questionable and that its implementation could create severe injustices on a global scale, particularly for already marginalised communities. There is also significant uncertainty surrounding which regions would be included and whether current inhabitants would be permitted to remain or face displacement. The likely emphasis on tropical and subtropical areas raises serious racial and colonial concerns, risking the continuation of historical patterns of domination, colonial displacement, and the erasure of Indigenous knowledge and culture under the guise of conservation. Moreover, Wilson's approach fails to address the systemic forces driving ecological destruction and the climate crisis. Instead of challenging the capitalist framework that perpetuates these inequalities, Wilson merely seeks to protect more space with a misplaced faith in capitalism. True "conservation" must not compromise human rights or global justice, nor reinforce the status quo driving inequality and environmental destruction, which it aims to protect.

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Keywords: Half-Earth, Conservation, Colonialism, Dualism, Nature

1. *Wilson's Half-Earth Proposal*

Edward O. Wilson, one of the most prominent advocates of the new Half-Earth theory, calls for the creation of vast, interconnected protected areas shielded from further economic development. Those regions should cover at least half of Earth's surface: on land, four times the size of Russia, and at sea, larger than the Pacific Ocean. Wilson's *Half-Earth: Our Planet's Fight for Life* is the final of a trilogy about how humanity "became the architects and rulers of the Anthropocene epoch."[1] The Anthropocene, the new geological epoch of humanity, coined by atmospheric chemist Paul Crutzen, suggests that humanity's extensive and profound activities have altered and replaced nearly all the previously 'natural' elements of the planet. Thus, we, without even realising it, have now entered into a new geological epoch named after us, the Anthropos. While Wilson agrees with the Anthropocene logic, he cautions against fully embracing its ideology, claiming that technological solutions, such as geoengineering, can have greater risks than *potential* benefits. While many believe humanity has full domination over the entire earth and feel entitled to its resources, Wilson warns that we are deeply dependent on the atmosphere, biosphere, and other organisms for our survival. He is, therefore, "convinced that only by setting aside half the planet in reserve, or more, can we save the living part of the environment and achieve the stabilization required for our own survival."[2] Wilson claims this is an emergency solution appropriate to the scale of the crisis we are facing.

However, not every conservationist agrees. Wilson discovers a rift among conservationists: On the one hand, there is the "neoprotectionist" or "back-to-the-barrier" movement, to which Wilson belongs. So strongly, in fact, that he wants to set up barriers across half of the earth. On the other hand, there is the rise of the "new" or "Anthropocene" conservation movement, which argues that humanity has altered global ecosystems so profoundly that we now must manage and care for the entire planet as one large "rambunctious garden, tended by us."[3] Presented by figures like Eileen Crist, Erle Ellis, Chris Thomas, and Emma Marris, new conservation claims that since nothing

[1] Wilson 2016, p. 2.
[2] Wilson 2016 p. 3.
[3] Marris 2011, p. 2.

is truly pristine anymore, we should instead focus on human-centred planning and adopt life on a damaged, used planet and manage it as we see fit: "pole to pole, of, by, and for us, the only species at the end of the day that really matters."[4] Wilson strongly opposes this perspective, arguing that by focusing exclusively on entire ecosystems, individual species and genes are often overlooked, which demonstrates a poor understanding of biodiversity data. It might be well-intentioned, he claims, but ultimately it is ignorant and anti-conservationist, calling it "the most dangerous worldview."[5] Wilson believes there is still time to prevent a catastrophic mass extinction, including possibly our own; however, the new conservation movement seems not to want to avert this fate, but rather to affirm it.

In "The Solution," the last part of *Half-Earth*, Wilson presents the Half-Earth proposal as the only feasible answer to the biodiversity crisis. He contends that setting aside half of the Earth is essential for both preserving biodiversity and sustaining human life. Wilson claims that conserving at least half of the Earth could protect over 80 per cent of species. Given how complex and unpredictable ecosystems are, he argues, we should aim to protect as much as possible. Furthermore, Wilson offers a psychological argument: conservation efforts often flounder without concrete objectives, whereas Half-Earth provides a clear, motivating goal, asserting that "people understand and prefer goals."[6] He frames the Half-Earth proposal as a moral imperative, claiming that as stewards of the planet, humanity has a responsibility to protect it: carrying out the Half-Earth proposal "on behalf of all of life would be humanity at its most noble."[7]

In a world increasingly threatened by the climate crisis, ecological degradation, biodiversity loss, and the potential for mass extinction, such a proposal *might* even seem necessary. However, we must critically examine what it would mean to set aside half of the Earth in a world rife with inequality, displacement, and exploitation. What half are we talking about? The tropics, subtropics, or the Global South, where marginalised communities already bear the brunt of environmental degradation? How would Half-Earth be implemented? What about

[4] Marris 2011, p. 71.
[5] Marris 2011 p. 79.
[6] Marris 2011 p. 4.
[7] Marris 2011 p. 212.

the people currently living in potentially designated Half-Earth areas? Would they be allowed to remain on their land, or would they be forcefully displaced?

2. *A Critique of Wilson's Half-Earth Proposal*

On the cover of *Half-Earth*, we see a "brave expression of hope, a visionary blueprint for saving the planet,"[8] but where is this so-called visionary blueprint? In a book called *Half-Earth*, one would assume that Wilson spends most of the time arguing about how to carry out such a bold proposal, but he doesn't. It appears Wilson sees his own proposal as so self-evident that he doesn't even need to justify it. But what is so obvious about setting aside half of the earth?

3. *A Lack of Specificity*

While Wilson and other naturalists describe certain regions as "the best places in the biosphere,"[9] it remains unclear whether those areas would become part of the Half-Earth or how they would be connected. Among them are the Redwood forests of California, Cuba, Hispaniola, the Amazon River Basin, the Greater Manu Region of Peru, the Galápagos Islands, Ethiopia, Mozambique, South Africa, Ghana, Madagascar, Borneo, Bhutan, Myanmar, New Guinea, New Caledonia, Hawaii, and so on. Interestingly, whole countries are listed here. Does Wilson think that these countries would agree to become protected areas with no further development? Would they remain under the same governmental control? Would people currently living there be allowed to stay on their land and homes, or would they face displacement? Would the people and countries be financially compensated? These are questions Wilson unfortunately never addresses. Instead, he focuses solely on the decline of flora and fauna and how devastating the loss of biodiversity would be. However, by failing to specify geographical areas, outline concrete policies, or explain the practical implementation of the Half-Earth proposal, Wilson's vision lacks specificity and remains rather a vague idea.

[8] Marris 2011.
[9] Marris 2011 p. 136.

4. *A Just Half-Earth Theory?*

Another pressing question arises: Is the Half-Earth proposal inherently just? To address this, I turn to Chris Armstrong's *Global Justice and the Biodiversity Crisis: Conservation in a World of Inequality*.[10] Armstrong challenges Wilson's strong claim that protecting half the planet would secure the survival of most species and ecosystems, arguing that we have only a limited understanding of ecological and human processes, which makes the outcome of such a bold claim rather uncertain. He also points out the potential moral costs to humans and issues of global justice in Wilson's and other Half-Earth proposals, emphasising the significant likelihood of exclusion and displacement. Displacing local and indigenous communities living near biodiversity hotspots or significantly limiting their economic activities, effectively displacing them differently, diminishes their agency and rights and exposes them only to further exploitation and abuse. If the Half-Earth proposal disproportionately targets the tropics and subtropics, which seems to be the case, it raises serious racial and colonial dimensions. Eric Dinerstein et al.[11] estimate that nearly 170 million people live in areas likely to be targeted for protection. This also presents major concerns about overcrowding as displaced populations are forced into smaller areas. Reducing available farmland could worsen food insecurity and increase deprivation among vulnerable groups. Armstrong also questions whether Half-Earth advocates believe those whose livelihoods are affected deserve compensation – an issue Wilson never addresses. Without adequate support for displaced or excluded communities, the risk of exploitation and injustice only increases.

5. *Conservation, Colonialism and Displacement*

To further gauge the real possibility for displacement within Wilson's proposal, we must look at the long history of conservation rooted in colonial displacement of Indigenous and local communities, disregarding their agency and rights and the erasure of non-Western knowledges and cultures. The American Wilderness Act of 1964 defines wilderness as "an area where the earth and its community of

[10] Armstrong 2024.
[11] Dinerstein 2017, pp. 534-545.

life are untrammeled by man, where man himself is a visitor who does not remain."[12] But what about the people who have been living there and caring for the land for generations? Do they not count? The establishment of National Parks is often celebrated as a conservation triumph; however, this narrative erases the violent history of displacing and dispossessing Indigenous and local communities, who have been living on and caring for these lands for generations, making them worth protecting in the first place. Notoriously, the creation of Yellowstone National Park in 1872 instigated the brutal displacement of Indigenous communities from their ancestral territories. Almost two decades later, the establishment of Yosemite National Park was also marked by the "premeditated, careful, and callous eviction of the Miwok, Yokut, Paiute, and Ahwahneechee peoples."[13] Moreover, as Karl Jacoby argues, once considered acceptable practices became crimes under new conservation laws, labelling Indigenous and local people as poachers, squatters, thieves, and arsonists, practically criminalising their traditional activities. Ultimately, they were erased from the landscape, their existence and claims expunged by reclassifying their inhabited land as "empty wilderness."[14] Brian Burkhart, a member of the Cherokee Nation, emphasises that Indigeneity is deeply connected not just to their people and nation but is "importantly tied quite literally to land [...] Locality is the originary and continual manifestation of being, of knowing, of meaning. Locality is being-from-the-land, knowing-from-the-land, and meaning-from-the-land."[15] Similarly, how an Indigenous Australian musician puts it, "[t]he whole culture is based on the spirituality of the land."[16] Severing these connections, whether by displacement or law, is inherently violent.

Yet, Wilson addresses this violent history only in passing, admitting, "[s]urely it was wrong – and ultimately futile – to fence off nature reserves from people already living in them or close by."[17] At the

[12] Department of the Interior, National Park Service and Office of Legislative and Congressional Affairs (1964), 88th Congress, Public Law 88-577: To establish a National Wilderness Preservation System for the permanent good of the whole people, and for other purposes.

[13] Murdock 2021, p. 239.

[14] Jacoby 2014, p. 85.

[15] Burkhart 2019, p. xii, xvii.

[16] Maddock 1991, p. 227.

[17] Maddock 1991, p. 84.

same time, he quotes Wallace Stegner describing America's National Parks as "the best idea we ever had."[18] This contradiction raises serious concerns that Wilson's Half-Earth proposal risks perpetuating the same epistemic injustices. While acknowledging past wrongs is a necessary first step, it neither atones for the violence caused by his discipline nor does Wilson propose any compensation. Therefore, we must assume that the Half-Earth proposal would simply expand the current National Parks model to half of the planet, which would lead to extreme injustice and violence on a new, unprecedented level, perpetuating colonial patterns of domination under the guise of conservation.

Conservation must reckon with its violent past, in which marginalised communities, especially Indigenous peoples, were historically displaced, dispossessed, and had their knowledge and culture erased in the name of conservation, often for the benefit of white Western populations. The history of conservation is not just one of peaceful environmental protection but is also marked by systemic injustice, racism, colonial dispossession, and displacement. Instead of continuing to impose top-down conservation measures that exclude local and Indigenous communities and undermine their knowledge, we must recognise the expertise and agency of those who have lived on and cared for these lands for generations. This is not merely a matter of social justice; recent studies show that areas managed by Indigenous and local peoples often sustain higher levels of biodiversity and ecological health than those run by external institutions.[19]

Thus, another critical question arises: who would govern these protected areas? Will it be conservation scientists, or will local and Indigenous peoples also have a voice? Wilson fails to recognise the significant harm caused by past conservation, therefore risks repeating the same epistemic injustice and denying local and Indigenous peoples their rightful status as authoritative knowledge holders of their own land. Meanwhile, it is these communities who ultimately bear the consequences of decisions made by policymakers far away.

[18] Maddock 1991.

[19] Mormorunni/Issistsáakiiksi 2021, retrieved from https://www.pbs.org/wnet/nature/blog/indigenous-led-conservation/.

6. *Wilson's Apolitical Genealogy*

Wilson's perspective is notably apolitical, unfortunately shared by many environmentalists and conservationists. But how can we achieve meaningful, equitable conservation without challenging the capitalist structures that prioritise profit above all else, including all living beings, the biosphere, the atmosphere, and even our survival? Interestingly, Wilson claims, that

> [t]he footprint will evolve, not to claim more and more space, as you might at first suppose, but less. The reason lies in the evolution of the free market system, and the way it is increasingly shaped by high technology. […] Just as natural selection drives organic evolution by competition among genes to produce more copies of themselves per unit cost in the next generation, raising benefit-to-cost of production drives the evolution of the economy.

However, this claim is wildly untrue. The evolution of the free market won't reduce humanity's footprint, nor will it halt the environmental degradation or the climate crisis. Capitalism's only goal is, in fact, to increase profit at any cost. It is depleting environmental, biospheric, and human resources at an ever-increasing rate, making it increasingly difficult and more expensive to obtain the same resources as before, while creating more and more pollution and waste. As Marx claims, "[t]he bourgeoisie cannot exist without constantly revolutionizing the instruments of production, and thereby the relations of production, and with them the whole relations of society."[20] For example, fracking was developed and utilised after more accessible oil and gas resources had already been depleted. It penetrates bedrock, causing greater ecological harm, raising public health risks, contaminating groundwater, and exposing people to more hazardous substances. Therefore, contrary to Wilson's claim, the evolution of capitalism will only worsen the climate crisis, accelerate environmental destruction, and deepen inequalities, all for the profit of a few.

Similarly, Bram Büscher et al. critique Wilson's Half-Earth theory for only focusing on the symptoms of the global biodiversity crisis while failing to address the root causes.[21] Ultimately, Wilson fails to

[20] Marx 2000, p. 248.
[21] Büscher 2017, pp. 407-410.

confront the systemic forces driving ecological destruction, capitalism's relentless pursuit of profit. While Wilson's proposal might be well-intentioned, it does not address the reality that these economic structures drive environmental destruction, biodiversity loss, and the climate crisis, threatening all living beings and our very survival. Rather than challenging the capitalist framework that perpetuates these inequalities, Wilson merely seeks to protect more space with a misplaced faith in capitalism. But how effective would it be to protect half of the Earth, with many negative human consequences, while allowing the ruthless exploitation of the other half?

7. *The Ultimate Dualistic Project*

"Nature Needs Half"[22] is another well-known slogan for the Half-Earth theory. Although Wilson acknowledges humanity's deep dependence on nature for survival, he also believes that "[n]ature is wild, nature is ancient, nature is pure." Or, in other words, he sees nature as completely separate from humanity, so separate, in fact, that he wants to set up actual barriers between humans and nature across half of the earth. Nothing illustrates the Western dualistic thinking better than this. However, this dualistic framework is inherently hierarchical and oppressive: nature is defined in stark opposition to culture, reason, masculinity, whiteness, and power. Nature is not merely different from culture; it is *less than*, it has been inferiorised, racialised, feminised, animalised, and rendered passive for exploitation. As Val Plumwood argues, such binaries serve to legitimise and justify exploitation and domination. It also constructs and upholds dominant identities: the master's identity is defined in opposition to the slave, and the slave's identity is tied to their closeness to nature. To be cast as 'nature' is akin to being rendered passive, stripped of agency and subjectivity, and reduced to be part of 'the environment,' an unseen background against which the accomplishments of reason or culture occur, typically dominated by white, Western, male authorities.[23] Theodor Adorno and Max Horkheimer

[22] Nature Needs Half 2009, retrieved from: https://natureneedshalf.org/ [Accessed 5 November 2025].

[23] Plumwood 1993.

reveal that the Enlightenment project, intended to liberate humanity through reason, has paradoxically led to new forms of domination. Nature has become something to be mastered, controlled, and instrumentalised, and this logic of domination has also been extended to certain human groups. They argue "[w]hat human beings seek to learn from nature is how to use it to dominate wholly both it and human beings."[24] Although often portrayed as beyond politics, the idea of nature has been conveniently used to uphold the status quo, legitimise social control, and reinforce existing inequalities and biases in society.

By failing to interrogate this Western dualistic framework, Wilson perpetuates an ideology that rigidly separates nature from humanity, thereby legitimising the exploitation of the non-human world and reinforcing harmful hierarchical social structures. The Half-Earth proposal, in fact, exemplifies this dualistic and imperialist logic perfectly: it envisions a world divided into two distinct halves, while masking the political and ethical implications of such separation. This approach not only treats nature as a separate, exploitable object, set aside on one hand while still being exploited on the other, but also imposes a Western colonialist perspective that disregards the agency of certain human groups, casting them as 'nature,' and deeming them as inferior.

8. *Conclusion*

Wilson's Half-Earth proposal ultimately rings hollow as it upholds the existing status quo that drives environmental destruction and social injustice, while also risking the perpetuation of colonial patterns of domination under the guise of conservation. This lack of critical thinking even leads Armstrong to suggest that the proposal may function as a distraction from the deeper reality that capitalism is inherently environmentally destructive.[25] Given the high probability of severe human consequences and global injustices – particularly for already marginalised communities – combined with the uncertainty surrounding its practical viability, Wilson's proposal should be firmly rejected. As Armstrong argues, "the most effective pro-conservation

[24] Horkheimer, Adorno 2002, p. 2.
[25] Armstrong 2024, p. 126.

policies might be policies aimed at reducing global inequality."[26] True "conservation" must be grounded in justice, equity, and respect for the voices of those who have been historically excluded, harmed, and marginalised.

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Marx, Stoffwechsel and eco-communism: from capital-community to a political community of nature

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Abstract

The essay begins by noting a convergence between ecology and Marxism. To develop a critical anti-capitalist thinking, this convergence must confront with Marx's concept of *Stoffwechsel*. Marx used *Stoffwechsel* to investigate three different processes: the material metabolism of society, the metabolic interplay between society and nature, and the metabolism of nature. By pushing the system's metabolic speed of reproduction to the limit, capital not only endangers natural and human reproduction but also deteriorates the social and material foundations for its growth, endangering its very existence. A counter-community, a *Gemeinwesen* that we might refer to as the political community of nature or eco-communism, may emerge as a result of this process, which weakens the capital-community that capital has attempted to create through the exchange of commodities and money.

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Keywords: Stoffwechsel, metabolic disorder, commodity, labour, Gemeinwesen

1. *Introduction*

The ecological crisis has revitalised critical thinking that had remained in recent decades in the shadows, confined to residual antagonistic components. The challenge posed by the need to oppose catastrophic capital has been taken up by a multitude of visions that have begun to identify the geo-capitalism as the main culprit of the ecological crisis. It is worth to note how parts of Ecologism and Marxism have converged contributing to a broad and multifaceted anti-capitalist front starting precisely from the analysis of the ecological crisis. This paper tries to contribute to this process identifying the theoretical links connecting the different battlefields – social, economic, ecological, and political – that constitute the enigmatic mix that signals the deep systemic crisis of geo-capitalism[1]. This chapter seeks to offer a perspective of organic critical thought at the height of capital's action, drawing on considerations based on Marx' work.

2. *The metabolic turn, Stoffwechsel and Marx's re-reception*

In the last thirty years, a "metabolic turn" provides a new scientific framework for researching the ecological impact of social systems such as cities and huge organizations, highlighting the rising pressure on ecological systems to the point of endangering their own regenerative processes[2]. The analysis of the metabolic flows of various social systems depends on the banal observation that they, for their reproduction and maintenance, extract matter and energy from nature, which they transform, distribute, consume and discard[3]. Fast and linear metabolic processes, such as those required by capital in its accelerated process of spatial and temporal expansion, cause rifts not only in ecological systems but also in social systems, manifesting as major injustices.

This quantitative approach to metabolism was foreshadowed and then supplemented by a theoretical proposal that emphasises the ontological centrality of capital metabolism, transforming it into a theoretical and political tool for understanding causes, effects, and

[1] Biel 2012.

[2] Fischer-Kowalski, Haberl 1993; Ayres, Simonis 1994; Fischer-Kowalski 1998; Giampietro, Mayumi 2000; Padovan 2000.

[3] Padovan 2015.

dynamics of the capitalism/nature crisis. It can thus be projected into a critical context, suggesting an understanding of Marx's work as a theory of the socio-ecological metabolism of capital[4]. Between the *Grundrisse* and the *Capital*, Marx used *Stoffwechsel* in three different meanings: the material metabolism of society, the metabolic interplay between society and nature, and the metabolism of nature[5]. These processes are inextricably linked, but they are not the same thing because they are marked by a significant ontological asymmetry that allows the biophysical to exist without the social, whereas the reverse is clearly impossible[6]. This asymmetry is one of the cause of capital systemic reproductive dysfunctionalities, as we are going to see.

3. *Commodity metabolism and social morphologies*

Marx's first use of the *Stoffwechsel* concept is in one of his *London Notebooks* of March 1851, entitled *Reflections*. In this text, Marx illustrates the role that money assumes as a medium of social material exchange for dissolving the patina of authority that envelops the members of society, thus erasing differences of class, religion, culture, individuals[7]. In these early passages Marx makes no reference to the exchange with nature, instead indicating the process of the exchange of the products of private workers which transforms these products into commodities and leads to the genesis of money. In the *Grundrisse* of the years 1857-1858 Marx points to money as the main agent of transformation of the generalised exchange of material goods (use-values) between individuals (necessary for the material and spiritual reproduction of society) into a process of social universalisation of value released from the material body of commodities themselves.

The general exchange of activities and products, which has become a vital condition for each individual – their mutual interconnection – here appears as something alien to them, autonomous, as a thing. In exchange value, the social connection between persons is transformed into a social relation between things; personal capacity into objective wealth[8].

[4] Meszaros 1995; Foster 1999; Burkett 1999; Clark, York 2005; Saito 2017; Moore 2017; Padovan 2018.

[5] Saito 2017.

[6] Carolan 2005.

[7] Marx 1986.

[8] Marx 1993, p. 157.

In the 1859 text *A Contribution to the Critique of Political Economy*, Marx re-uses the concept of *Stoffwechsel* to explain how the process of commodity exchange transforms social material metabolism by dissolving the metabolic – spatial and social – limits of non-capitalist modes of production that confined its power, while at the same time creating social relations of production and exchange that crystallise over time. The metamorphosis of the commodity into money is the process that not only breaks down the limits of local organic social exchange, but also dissolves the elements that constituted the tradition or the "silly sacredness of communities" that regulated social metabolism:

The metamorphosis of commodities C-M takes place for the sake of their metamorphosis, for the purpose of transforming particular physical wealth into general social wealth. Change of form – instead of exchange of matter – becomes an end in itself. Exchange-value, which was merely a form, is turned into the content of the movement. Commodities remain wealth, that is commodities, only while they keep within the sphere of circulation, and they remain in this liquid state only in so far as they ossify into silver and gold. They remain liquid as the crystallisation of the process of circulation[9].

In short, for Marx, *Stoffwechsel* is, at this point in his thinking, the continuous process of metamorphosis of commodities from use-value to exchange-value, a process that is merely formal, but which is, at the same time, the creation of certain relations of social production, into which individuals enter.

4. *Socio-ecological metabolism and commodity ontology*

The analysis conducted by Marx in the *Grundrisse* and in *A Contribution* of the material process of social exchange (social metabolism), whereby value separates from its material bearer (*Träger*) to become money and capital, presupposes the material metabolism with nature. Before organic social exchange takes place, society must produce what is to be exchanged. The nexus linking social metabolism with social-ecological metabolism is the commodity. After celebrating the social power of the commodity in the form of money, it is necessary to investigate its material roots. In this perspective, there is no doubt

[9] Marx 1987, p. 361.

that the commodity – in its different forms of matter, labour, and value – is the alpha and omega of the social, the golden spike of capital as well as its imperishable end. As said by Marx, "… if we consider societies where capitalist production is highly developed, we find that the commodity is both the constant elementary premiss (precondition) of capital and also the immediate result of the capitalist process of production"[10].

The commodification of "things" subjugates them to a process of duplication of their formal characteristics, but never to a true separation. The commodity is not only value, but also nature manipulated and transformed by labour. It is a mixture of the natural and the social as well as the labour that produces it, which is also concretely unique but ontologically separated into concrete and abstract: labour that transforms nature and labour that produces value. Here the synthesis of nature and society is manifested, and Marx's materialism is also extruded. As said by Marx:

On the other hand, since material wealth, the world of use values, exclusively consists of natural materials modified by labour, hence appropriated solely through labour, and the social form of this wealth, exchange value, is nothing but a particular social form of the objectified labour contained in the use values; and since the use value, the real use of labour capacity is labour itself, i.e. the activity which mediates use values and creates exchange value, it follows that labour capacity is, just as much, the general possibility of material wealth and the sole source of wealth in the particular social form wealth has as exchange value. Value as objectified labour is after all only the objectified activity of labour capacity[11].

It is the objectification of labour capacity that by transforming nature makes possible both material and social wealth (value). Accordingly, labour is the medium of the metabolic cycle between society and nature, activity that sets socio-ecological metabolism in motion by mobilising forces of nature, both the human and the extra-human. It is here that the ontological asymmetry between labour, production and nature emerges. Capital constantly organises and reorganises the material exchange between society and nature in ways that challenge this incongruence. The rotation time of capital is temporally and spa-

[10] Marx 1976, p. 949.
[11] Marx 2010, p. 40.

tially limited to the natural characteristics of the raw materials required for commodity production and valorisation, which are constantly manipulated and forced. As said by Marx:

Working time is always production time, i.e. time during which capital is confined to the production sphere. But it is not true, conversely, that the entire time for which capital exists in the production process is necessarily therefore working time… What is involved is rather an interruption independent of the length of the labour process, an interruption conditioned by the nature of the product and its production, during which the object of labour is subjected to natural processes of shorter or longer duration, and has to undergo physical, chemical or physiological changes while the labour process is either completely or partially suspended[12].

Regardless of how hard one tries to synchronize nature, labour, and capital, they all operate in distinct temporality and spatiality, resulting in stops, discontinuities, disruptions, and the prospect of a crisis. This is the reason why, for Marx, "In so far as this time of production over and above the labour time is not determined by natural laws given once and for all… the turnover period can often be shortened to a greater or lesser extent by the artificial shortening of the production time"[13], technical measures that contribute to the metabolic disorder.

5. *Metabolic flows and metabolic rift*

Marx used the idea of *Stoffwechsel* in different ways, as we have seen. Here, we highlight the "irreparable rift" to the universal metabolism of nature caused by the expansion process of capital, meaning a profound fracture in the biogeophysical laws that regulate the cycles of energy and matter in the entire biosphere and geosphere. In other words, the social metabolic capital's mode of reproduction violates the energy-matter exchange of equivalents by shifting from a mode of appropriation, which is characteristic of all forms of social metabolism, to a mode of dispossession, or appropriation without exchange, thus violating the requirements of nature's universal metabolism[14]. Foster revived the term metabolic rift, which Marx introduced in the third

[12] Marx 1992, p. 316.
[13] Marx 1992., p. 317.
[14] Foster, Clark 2020; Hedlund, Longo, Clark 2022.

volume of *Capital*[15], making it the conceptual core of ecomarxism. Many others have followed him on the same theme. In that passage, Marx warns of an 'irreparable rift' – *unheilbaren Riß* – of natural metabolism caused by capitalism[16]. As is now known, the universal metabolism of nature is continually altered by the processes of production that occur under capitalism, to the point of radically reducing the regenerative capacity of the planet itself[17].

However, it remains unclear if this ecological deterioration, this fundamental alteration of the capital-nature nexus represents a threat not only for the planet's societies, but also for capital, beyond which capital metabolism enters gradual dissolution. As said by Mészáros[18] the ecological crisis poses the question of the "absolute limits of capital". All social metabolic orders have "intrinsic or absolute limits which cannot be transcended" without entering a deep state of metabolic disorder. In other words, metabolic rift, along with the material repercussions of droughts, floods, and severe temperatures, might lower the overall fertility of nature exploited by capital, which Marx refers to as the 'natural fertility of capital'. What might be the consequences of this reduction in fertility? For Marx,

> In as much as its price is raised by fluctuations in the price of the raw material of which it consists, or of the ancillary material that it needs in the course of its operation, the rate of profit falls in proportion to this, and vice versa… The only point we want to note here is that natural riches in the shape of iron, coal, wood, etc., the main elements in the construction and use of machines, appear now as a natural fruit borne by capital and form an element in the determination of the rate of profit that is independent of the high or low level of wages[19].

Where there is ecological degradation, it is easy to imagine a decrease in the natural fertility of capital as well as an increase in the prices of energy and raw materials used in the production of various goods, from the means of production to the livelihoods of workers and their families. In brief, metabolic rifts can have an immediate impact on the profitability of capital assets. Then, the competition for profits

[15] Foster 1999.

[16] Marx 1991, p. 949.

[17] Steffen et al. 2015; Görg et al. 2020; Richardson et al. 2023; Vettese, Pendergrass 2022.

[18] Mészáros 1995.

[19] Marx 1991, p. 201.

can often lead to disputes, conflicts, and wars in order to modify the metabolic order may all contribute to the rise or fall of profits. But here we are interested in noting how the prices of raw materials, agricultural and mineral, depend on the fertility of nature and enter into a state of chaotic variability.

6. *Capital as an organic system and the genesis of the capital-community*

The metabolic model outlined so far, analysed in its three configurations of social, socio-ecological and ecological metabolism, allows us to question the tendency of capital to totality, a question that implies directly political perspectives. The continuous process of expansion of the circulation of the commodity-form and money explains the constitution of capital as an organic system. As Marx puts it:

Thus, in this respect, as the general representative of wealth and as individualized exchange value, [money] was doubly a means for expanding the universality of wealth, and for drawing the dimensions of exchange over the whole world; for creating the true generality [Allgemeinheit] of exchange value in substance and in extension[20].

Believing, as Marx does, that capitalism is an organic system that produces its own premises and projects itself towards totality implies overcoming its external historical premises, proceeding from itself to create the conditions for its maintenance and growth[21]. An organic system that was able to subordinate the entire socio-ecological complex to itself would be a success story, a historical victory achieved by atomising individuals, separating them from the 'inorganic conditions of human existence' and subjugating them both. As Marx argues in a famous passage:

It is not the unity of living and active humanity with the natural, inorganic conditions of their metabolic exchange with nature, and hence their appropriation of nature, which requires explanation or is the result of a historic process, but rather the separation between these in organic conditions of human existence and this active existence, a separation which is completely posited only in the relation of wage labour and capital[22].

[20] Marx 1993, p. 225.
[21] Lebowitz 2020, p. 44.
[22] Marx 1993, p. 489.

Capital has been able to move towards its self-constitution as an 'organic totality' on the one hand by dissolving the community ties that prevent capital from transcending the limits of socio-ecological metabolism; on the other hand by reconstituting the human community in a form suited to its processuality: "The community of individuals is restored in the form of the collective worker, individuality reduced to being a user of capital... This presupposes the integration of men into the capital process and the integration of capital into men's brains"[23]. For Lebowitz and Camatte, capital as an organic system is able to forge its own component parts, i.e. a particular type of human subject, fragmented and paralysed, whose prime social relationship is money. As Marx says:

Money thereby directly and simultaneously becomes the *real community* [Gemeinwesen], since it is the general substance of survival for all, and at the same time the social product of all. But as we have seen, in money the community [Gemeinwesen] is at the same time a mere abstraction, a mere external, accidental thing for the individual, and at the same time merely a means for his satisfaction as an isolated individual[24].

However, actually existing capitalism is not an organic system but contains elements not compatible with capitalism as an organic system[25]. If we consider capitalism as an "organic system" that, at least until now, has not been able to subordinate all the elements of society and nature to its own characteristics and assumptions, we need to understand what the negative of this process might be. This is the main challenge facing the ecological revolution.

7. *The return of the Gemeinwesen: hints for the ecological revolution*

The horizon of capital asserting itself as a total organic system immediately raises the issue of its overcoming, the genesis of its antithesis. The formation of the capital-community that has replaced the human one over time also brings with it its negation, which allows us to challenge capitalist realism. Marx himself believes that such an ideal and utopian horizon of capital could never be realised because

[23] Camatte 2019, p. 17.
[24] Marx 1993, pp. 225-226.
[25] Lebowitz 2020, p. 161.

ultimately capital, even in its most fetishised and abstract form as capital-interest, could never emancipate itself from the process of production in which human labour as well as nature are determinants.

But from the fact that capital posits every such limit as a barrier and hence gets ideally beyond it, it does not by any means follow that it has really overcome it, and, since every such barrier contradicts its character, its production moves in contradictions which are constantly overcome but just as constantly posited. Furthermore. The universality towards which it irresistibly strives encounters barriers in its own nature, which will, at a certain stage of its development, allow it to be recognized as being itself the greatest barrier to this tendency, and hence will drive towards its own suspension[26].

Marx shows several limits to the capital expansion toward "organic totality", the principals being the contradictions between production and valorisation (circulation) and the decreasing natural fertility of capital. By disproportionately expanding its potential, capital sets itself as a fundamental limit to the universality of its mode of production, eroding the material basis of its expansion. In short, *Stoffwechsel* shows the possibility of the crisis. We still do not know how cogent these socio-ecological limits are, and how far they can be overcome or circumvented by capital, this dilemma being represented by Marx by the positions of Ricardo – who considered capital capable of overcoming all limits – and Sismondi – who considered these limits to be increasingly difficult to deal with. In essence, Marx is telling us that capital is not yet in its real functioning a total organic system, and it is slowly crumbling the material and social foundations on which it was erected.

Having to deal with the obstacles to its self-valorisation process that arise in all three metabolic cycles and conflicts that circumvent them, capital is creating a "metabolic chaos" that is revamping new tensions inside its own *Gemeinwesen*. Here, the potential of a political community emerges, making this latter a new system that not only coexists and interpenetrates with the capital system, but also struggles with it, thus mutually deforming one another[27]. Individuals who find themselves in a state of involuntary adjacency that takes the form of the capital-community fight against such domination in order to

[26] Marx 1993, p. 410.
[27] Lebowitz 2020.

embrace a new organic-community – that is, the community of those who care as equals for the fate of the Earth. Only a community against and beyond capital – made of a plurality of subjects such producers, inhabitants, people, women, and minorities – can save the planet and the humanity, a community that produces itself as a social organisation emancipated from capital. In this view, the capital-community is opposed by the political community of nature, which promotes the socially internally articulated whole of the various forms of existence.

These considerations open up the issue of eco-communism. If we reconsider its original meaning and abandon the connotations it has acquired in relation to historical regimes, communism is increasingly presenting itself as the horizon beyond which we can overcome the threat of ecological catastrophe. Communism can here mean "community of life", "community of producers", "ecological community", "communalist politics", "production of commons", all meanings that pertain an ecological society. As Bensaid suggests, "the word communism is … the most explosive programmatic charge against capitalist catastrophe. It is the word that best evokes the commonality of sharing and equality, the pooling of power, solidarity as opposed to selfish calculation and generalised competition, the defence of humanity's natural and cultural commons, the extension of free services (decommodification) to basic necessities, against generalised predation and the privatisation of the world"[28].

8. *Conclusion*

The methodological and epistemological perspective of *Stoffwechsel* as developed by Marx throughout his work offers not only various possibilities for dialectising nature and society, but also for understanding the current complex dynamics that are profoundly shaking the centuries-old nexus between nature and capital. The enormous production of goods, the overwhelming increasing in nature and labour's global extraction and the decline in nature's fertility constitute the material conditions in which the possible internal decay of the capitalist system is maturing. However, the way in which global capital is addressing the challenges posed by the socio-ecological crisis – by investing in technology and war – suggests that it has no intention of renouncing its

[28] Bensaïd 2009, p. 14.

project of establishing itself as a total organic system. At the same time, the weakening of the capital-community offers us the opportunity to constitute a counter-community capable of opposing it. Now that the fascist and totalitarian imaginaries of the community have evaporated with their natural absorption into the capitalist frame, there is the possibility of opposing the capital-community with a nature-community that socialises the products of everyone's labour, that reduces the power of money over social relations to the extreme, that harmoniously regulates the exchange with nature, that makes decisions on a direct democratic basis, that dialectically recomposes the world of the living. A rational social-ecological metabolism thus depends on collective action that is not merely the efficient coordination of countless individual actors facilitated by the technical system, but implies a new *Gemeinwesen*, a political community of nature based on democratically chosen metabolic activities and practices that are put in place by those who do not have a community and with a steady gaze towards the horizon of sufficiency.

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Metabolic Normativity: Organic and Orgiastic Metabolism in Foster and Moore[1]

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Abstract

This paper considers the normative foundations in the metabolism theories of John Bellamy Foster and Jason W. Moore. Drawing on Gilles Deleuze's critique of organic and orgiastic representation, the paper argues that beyond their disagreements over dualism and monism, Foster and Moore both accept the dogmatic image of Western philosophy in their formulations of metabolic alternatives to the capitalist metabolic regime. Whereas Foster posits a return to a natural state of metabolism, Moore invokes a theological metabolic totality. However, the two thinkers coincide in deploying an uncritical transcendental ground for their normative alternatives. The paper concludes by cautioning against philosophical shortcuts in theory-building and pointing out the biopolitical implications of the uncritical treatment of life as a normative foundation.

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1. *Introduction*

As is well known,[2] a methodological disagreement has divided the metabolic school of Marxist ecosocialism, fracturing it along two distinct approaches to the concept of metabolism. Initially, Jason W. Moore accused John Bellamy Foster of practicing Cartesian dualism in his conception of the metabolic rift:

> It is an eminently Cartesian way of seeing, one that accounts for capital's depredations upon the 'environment' in the same way that capital surveys, accounts, and quantifies nature's utility for accumulation. It is an ontology that produces a critique of the social domination of nature while valorizing its inner logic. It is a line of critique, in other words, that reproduces the very alienation of nature and society it seeks to transcend.[3]

For Moore, Foster confuses the results of the dialectical process with the actual dialectic itself: although Foster critically discusses the relations between nature and society under capitalism, he accepts the very categories of nature, society, and capitalism as fundamental, missing a deeper dialectical process by which they are produced. The result is alienated abstraction, or categories disconnected from their real genesis. Moreover, this process of dialectical relationality at the surface imitates the logic of capital, in which commodities are brought into exchange relations while ignoring their origin in the hidden abode of production.

In his response, Foster dismissed Moore as a Latourian Marxist who confuses language games with a real dialectic:

> In order to escape any tinge of dualism – or the irreducibility of both nature and society – Moore relies on a strategy of what could be called discursive bundling. He either utilizes hyphens, combined with the preposition "in," meant to suggest internal relations (for example, "capitalism-in-nature" and "nature-in-capitalism" [Moore 2014, 12]), or he relies on various metaphors such as bundles, hybrids, and webs.[4]

[2] See Heron 2011.
[3] Moore 2011.
[4] Foster 2016.

According to Foster, Moore dissolves dialectical categories into a linguistic soup of metaphors and abstractions in which the play of syntactic relations evacuates the real content of the dialectical process. The supposedly deeper dialectic that Moore wants to reach is only a mirage generated by a procedure of fetishism. Worse yet, this logic of false dialectical depth imitates the process of the capitalist market by substituting the poetics of exchange value for the real processes of production.

This disagreement is more than a personal dispute, as attested by the fact that other scholars have been taking sides – in print, online discussions, and live conferences. For instance, Fred Murphy and Ian Angus clashed over their respective endorsements of Moore and Foster,[5] while figures representing the new generation of metabolic rift scholars, such as Kohei Saito,[6] have also aligned themselves with either of the two founding fathers.

In short, Foster is accused of pursuing a surface dialectic which ignores the real depth, whereas Moore is denounced for inventing a false depth without relation to the real. There is a good deal of irony in these crossed accusations. The two authors accuse each other of largely the same crimes: misunderstanding the real dialectic and confusing the results with the process; inadvertently reproducing the exchange-value logic of capitalism; and generating abstractions disconnected from their actual conditions of production. In fact, both authors offer sound criticisms of each other; if we were to take them seriously, the conclusion would suggest itself that the entire metabolic school of Marxist ecosocialism is a capitalist sham whichever way you look at it.

Nonetheless, I will argue that the underlying problem with the metabolic school of Marxist ecosocialism has nothing to do with reproducing capitalist logic or following such heresies as Cartesianism and Latourianism. Instead, by drawing on Gilles Deleuze,[7] I will propose that the difference between Foster and Moore can be understood in terms of organic and orgiastic representation as applied to the concept of metabolism. For Deleuze, these modes of representation are

[5] Climate and Capitalism, retrieved from https://climateandcapitalism.com/2016/06/23/two-views-on-marxist-ecology-and-jason-w-moore/.

[6] Saito 2022, pp. 119-125.

[7] Deleuze 2001.

two ways in which the dogmatic image of Western philosophy sustains itself. The forms of the metabolic rift theory defended by Foster and Moore, which loosely correspond to organic and orgiastic representation, are two different expressions of metabolic thinking that is unwilling to question its own foundations. The result, as I argue in the Conclusion, is the double threat of reactionary metabolic biopolitics supplemented with a theology of metabolism.

2. *Metabolism Diagram: Typology, Interruption, Drivers*

Before analyzing Foster and Moore, I will sketch a general diagram of how theories of metabolism are usually conceptualised in the metabolic school of Marxist ecosocialism.

To begin with, the basic definition of metabolism goes as follows: metabolism is the exchange of matter and energy. In addition, three types of metabolism are generally accepted, namely, natural metabolism, natural-social metabolism, and social metabolism. However, this basic definition and typology tell us very little about the nature and conditions of metabolism. For example, does the exchange of matter and energy *across space* function in the same way as the exchange of matter and energy *over time*? Are the principles for the exchange of matter and energy in natural systems isomorphic with the principles for the exchange of matter and energy in commodity and financial markets? Perhaps even more importantly, how does space become geography, and how does time become history? In other words, when we move between the different types of metabolism, how should we transform our concepts along the way? Therefore, we see that already with the three kinds of metabolism, a significant amount of work is needed to push it beyond a simple formalism and towards an actual theory of universal metabolism.

To make matters more complicated, when we speak about the metabolic *rift*, another dimension is added to the discussion: the interruption of metabolism, and the consequent splitting of metabolism into two states. In fact, the concept of metabolic rift entails that metabolism can exist in the states of normality and abnormality. If we consider the three kinds of metabolisms mentioned earlier, we could ask whether abnormality works in the same way across all three metabolic types, and whether all three metabolisms must be in the same state at all times. For instance, does abnormality in natural me-

tabolism work in the same way as abnormality in social metabolism? And can we have the social metabolism in a state of normality while the natural and the natural-social metabolisms persist in a state of abnormality?

Then, just as metabolism is split into two states, the interruption is also doubled: we have one set of drivers that interrupt normal metabolism and initiate the abnormal state, and then we have another set of drivers which are supposed to return metabolism to its normal functioning. In Marxist ecosocialism, these two kinds of drivers have been generalised as "capital" and "associated producers," but we could reasonably wonder whether these abstractions contain sufficient internal differentiation to address all the distinctions between the various kinds of metabolisms and their normal and abnormal states.

To summarise, we have three kinds of metabolism (natural, natural-social, and social); two metabolic states (normal and abnormal); and two sets of opposed drivers (capital and associated producers). Therefore, to give a unified account of universal metabolism and its interruptions, one would have to engage in a complex undertaking of theory-building. Although the metabolic school of Marxist ecosocialism has addressed some of this complexity, a great deal of it has been circumvented by deploying organic and orgiastic forms of representation as a means of escaping theoretical difficulty. As I will argue below, the political consequences of this shortcut are highly problematic.

3. *John Bellamy Foster: Organic Representation*

First, I propose that we apply the diagram of metabolism developed above to Foster's conception of the metabolic rift. In Foster, the category that is most thoroughly developed is that of abnormal metabolism, which revolves around the division between town and country. For instance, we encounter this division in his earliest writings on Marx's metabolism;[8] in his considerations of ecological imperialism in relation to the Guano trade in the 19th century;[9] and in his endorsement of the Anthropocene interpretation provided by the Stockholm Resilience Centre.[10]

[8] Foster 1999.
[9] Clark, Foster 2009.
[10] Foster, Clark, York 2010.

According to Foster, the division between town and country is characterised by unnatural exchange. Nutrients and resources are extracted from their natural environments in the countryside and transported to distant points of production and consumption. The same applies to people who are uprooted through coercion and displaced from the countryside, from the periphery, and from the Global South towards cities, metropolitan centers, and the Global North. In other words, everything is taken and nothing is returned, not even waste. As part of this unidirectional, non-reciprocal exchange, local reproduction is interrupted and often destroyed: soil is exhausted, resources are extracted, and people are displaced. Consequently, the point of origin cannot reproduce itself as it was before the onset of exchange.

What drives this unnatural exchange, and hence what drives the shift from normal to abnormal metabolism, is capitalist transport. People do not work at their place of birth; soil and resources are not utilised at their point of extraction; and commodities are not consumed at production sites. Instead, everything is set in motion and reshuffled, everything is transported across great distances, and in the process, various natural boundaries and thresholds are distorted. In fact, I would argue that for Foster, there is no such thing as capitalist transport; rather, capitalism *is* transport. Capitalism and transport are the same phenomenon under two different names. Consequently, the metabolic interruption and the change of state from metabolic normalcy to abnormality is driven by capitalism understood as the transport of soil, resources, and people away from their natural origins.

On the one hand, Foster makes a coherent argument with sound empirical evidence, especially when it comes to colonial extractivism. The conceptual, political, and ethical difficulties begin, however, when he has to work out the *other* half of the metabolism diagram – that is, the part concerned with normal metabolism and the drivers supposed to enact the change from abnormality to normalcy. We are told by Foster that only "associated producers" are capable of enacting this change, but who these producers are and what the basis of their association is remains nebulous. The concept of associated producers in Foster is a placeholder – a mostly empty expression with limited content.

The situation only becomes worse when Foster considers what normal metabolism would look like. We are told that the normal metabolism enacted by associated producers will be "rational," but this

is a tautology: normal metabolism is rational, and rational governance is simply the implementation of normal metabolism. In addition, Foster states that normal metabolism will be "circular," and this is, I would say, the beginning of the most problematic part of the argument. What does it mean for something to be circular? It is not enough to attribute a kind of green capitalism to Foster; he would not accept this merely economistic interpretation. Instead, Foster means something significantly more radical. We are told that associated producers will "return" metabolism to its natural state – that is, as it was before the interruption. But what was the metabolic interruption if not transport? In other words, for Foster, the return to metabolic normalcy must involve the negation of transport and its consequences – the return of nutrients to their fields, and I would say the exodus of people from cities back towards the countryside, but also from the metropolitan centers to the periphery, and even, perhaps, from the Global North back to the Global South. Just as significantly, Foster also speaks about a return to "genuine human needs." We are not told what these needs are, and so we can only infer, since we are speaking about a "return," that the genuine human needs will be indexed to pre-capitalist societies, meaning societies before the onset of global capitalist transport.

To summarise, in Foster, the abnormal metabolic state is conceptually overdetermined in relation to the state of normal metabolism. In fact, the entire part of his conceptual apparatus related to metabolic normalcy is founded upon the idea that "life itself" is prescriptive – that by means of natural reason, we can identify the normative order grounded in nature. Beneath the chaotic disruptions enacted by capitalism, "an apparent equilibrium"[11] awaits to be discovered by organic representation. If we combine this with the previous mistrust of transport, we effectively end up with an Eleatic ontology that is profoundly dismissive of motion and an Aristotelian epistemology premised on the natural orientation of common sense. And so, the problem with Foster is not dualism but a kind of micro-teleology: everything has its natural place, and life follows a pattern of normative distribution that can be intuitively perceived by rational producers. It is true that Foster openly and clearly denounced teleology,[12]

[11] Deleuze 2001, p. 35.
[12] Foster 2000.

but it was the kind of macro-teleology of scholasticism, the idea of a transcendent direction. What we find in Foster, instead, is the immanence of a thousand micro-teleologies – of peoples and resources falling back into their natural places as they were before the onset of capitalist transport.

4. *Jason W. Moore: Orgiastic Representation*

Turning now to Moore, beyond the Cartesian dualism debate, he proposes another significant criticism of Foster: the latter does not address the problem of language,[13] or the way in which one establishes the relationship between the concepts of analysis and their ground. It is this criticism that comes closest to identifying the fundamental problem with Foster's reliance on organic representation. Concepts are not immediate representations of natural states of affairs – they are, instead, participants in the production of sense. There is not, first, a natural world endowed with a normative order revealed by organic reason and conveyed by a scientific language that expresses the match between concept and world. Rather, there is only a mediated world in whose epistemic production we deploy the entire range of the knowledge economy with its historically developed categories. With Foster, however, there is a constant falling back upon an intuitive understanding of "life itself" and "genuine needs" that requires no further explanation. In my view, it is this naturalism that Moore finds problematic; and if anything, his criticism of Foster has been too mild in this regard.

With all the above in mind, it is shocking that, in the end, Moore repeats the same fundamental problem as Foster.

On the one hand, Moore is no longer preoccupied with transport in the same way. It is not the fact of transport that he finds problematic; rather, he questions the scale of impact.[14] Instead of a focus on distance and displacement from natural locations, we find a shift towards intensity and the rate of transformation to which landscapes are exposed. Therefore, the problem of metabolic normality and abnormality changes from distance to speed: it is the rate of transformation and the intensity of impact that Moore finds problematic about

[13] Moore 2011.
[14] Moore 2000a; 2000b; 2002; 2016a.

capitalism rather than the breach of a natural distribution. At the same time, we are faced with the familiar problem of benchmarking: certain speeds are better than others, and there seems to be a preference for slowness over velocity. But how do we know which speed is good and which is bad? How can we distinguish between dangerous acceleration and desirable constant velocity?

Instead of appealing to an organic metabolic order, Moore falls back on the concept of the web of life: a grandiose notion of the totality of all relations, in which everything fits from the smallest encounters to the largest macrosystems. But is there a more precise definition of the web of life? We are never told what it consists of; the concept is constantly deployed but minimally defined.[15] Moore offers multiple descriptive statements: that the web of life is a totality; that everything is co-produced through and within the web of life; that the web of life is not a container; that the web of life is the foundation of vital existence; but also that the web of life is co-extensive with the longue-durée of geology; and so on. None of these statements provides a definition or exhibits dialectical development; what we have is a set of differential fragments of a definition. In other words, Moore sets up the web of life as an empty signifier capable of representing everything while conveying no particular meaning. Following Deleuze, we can describe this strategy as an orgiastic approach to representation:

> When representation discovers the infinite within itself, it no longer appears as organic representation but as orgiastic representation: it discovers within itself the limits of the organised; tumult, restlessness and passion underneath apparent calm.[16]

It is not clear what is gained by substituting the finite ground of an organic order with an appeal to the infinite productivity of total nature. Much like Foster, Moore wants to establish a normative claim against capitalist metabolic ordering, but the orgiastic notion of the web of life, with its unbounded capacity for expression, seems to point in the other direction, away from facilitating judgment – unless one intimates that capitalism is a limitation against infinite productivity and a cosmic crime against nature's capacity for self-expression. In

[15] Moore 2015; 2016b; 2022.
[16] Deleuze 2001, p. 42.

all this, the implication is that a better form of expression is possible, but one that cannot be stated openly in order to avoid foreclosing the infinite potentiality of the web of life.

Therefore, we begin to see that Moore's metabolism theory is not that different from Foster's. On the surface, the two thinkers could not be more distinct: Foster relies on organic representation by positing a natural equilibrium which reason can access and language can express. Moore, meanwhile, proposes an undifferentiated and ultimately empty concept of the web of life within his framework of orgiastic representation. The issue with both of these approaches is not dualism or monism but the inability to describe the normal state of metabolism without performing a transcendental subtraction. In discussing normal metabolism, Foster talks about "genuine needs" and "life itself," whose definition is not subject to any elaboration. Moore similarly mentions "real needs" in "the web of life" without offering further development. In the end, both thinkers employ a concept of "life" that is isolated from analysis, development, and criticism and installed as the transcendental ground of normal metabolism. Both thinkers pronounce themselves as dialectical while exempting their foundational concepts from the very dialectical process which they defend. In the end, their shared limitation is the inability to establish a normative ground for non-capitalist metabolism without appealing to different forms of dogmatic philosophy.

5. *Conclusion*

Instead of developing a theory connecting the three kinds of metabolism and their two states along with the two possible drivers, Foster and Moore look for shortcuts: the former adopts an organic conception of life itself whereby, without capitalism, everything should fall to its natural place, while the latter uses an orgiastic construction of a total concept capable of determining everything while remaining infinitely determinable. The problematic implications of both strategies extend beyond theory and become particularly acute in relation to the potential political consequences of the normal state of metabolism.

With Moore, the endeavour takes on a theological dimension with little scope for action beyond invoking the sanctity of the whole and falling on one's knees before the awesome power of the web of life. A

political endeavour gives way to an aesthetic project of moral feeling in which the sensibility of the whole becomes the normative basis for a new metabolic order.

In a sense, the implications of Foster's organicism are more terrifying because they play out at the level of biopolitics. If the idea is that capitalist transport has unnaturally dispersed entities from their natural places, then the abolition of capitalism should return the displaced to where they belong: resources to their landscapes and people to their locations of birth. The implication seems to be a geographical determinism and a ban on movement, which strangely echoes contemporary conservative sentiments against migration. In addition, how far are we willing to follow the idea of metabolic naturalism? If there are genuine, natural desires in addition to natural locations, what is the status of needs conceived under bourgeois society? Are there also natural roles for the sexes, for example, which the capitalist rifting of desire has twisted? Would a society following the natural course of metabolism even require such artificial institutions like democracy? The notion of natural metabolism is enticing as a criticism of ecological disruptions, but given that the rift is political and social as well, the subsequent naturalization of historical categories seems to approximate the most conservative ideas about biopolitics.

In the end, just as organic and orgiastic representation form the two halves of the dogmatic image of Western thought, so the natural and theological kinds of normal metabolism complement each other. One can imagine an outcome in which pathological capitalist metabolism is returned to its normal state according to the normative proposals of ecosocialist Marxism: in such a world, constrained by the biopolitics of the natural order of life itself, which reduces populations to the bare reproduction of genuine needs, one could at least pursue spiritual liberation by celebrating the theology of the great web of life. An orgiastic, theological ontology for an organic, authoritarian biopolitics. Against this dystopian counterfactual, one can only affirm the significance of rigorous theory-building that does not look for shortcuts and is willing to subject its transcendental ground to critical scrutiny. Then, perhaps, we can hope for a full theory of universal metabolism composed of dialectical life rather than life itself, historical rather than genuine needs, and political rather than natural or speculative reason.

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Quo vadis fossil capitalism?

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Abstract

Fossil capital has responded to mounting climate action by deploying a three-pillared approach to reconcile fossil fuel-based capital accumulation and emission reduction targets, the three-Ds: denial and dilute, decarbonise, and deflect. This essay explores these pillars of action by highlighting how the initial response of fossil capital focused on outright denying climate change and contesting scientific evidence, which was later complemented by emphasising the high costs of action. This pillar was paired with involvement in global climate governance and sustained ambitions to alter national interventions that ensured the perpetuation of fossil fuel dependence. The decarbonise strategy became prominent as renewable energy sources became more competitive in the 2010s and global momentum to take climate action increased following the Paris Agreement in 2015. Fossil capital establish it a constructive role in decarbonisation based on technological fixes that reconciled the exploitation of fossil fuels while limiting emissions linked to their combustion. Interests underscored the prospect of decarbonising fossil fuel consumption through carbon capture and storage and by producing hydrogen from methane without emitting greenhouse gases. These have remained oft-discussed and deeply entrenched ideas, but only prospective solutions and the technologies have failed to materialise at scale despite ample public subsidies. Deflect is the third prospective strategic intervention that entails geoengineering, which can help reconcile fossil capitalism and climate change. The technology may be prospective, but it ensures the continuance of the prevalent social system. This paper delineates fossil capitals strategies and their relation to ensuring the systems legitimacy in spite of the need to take climate action.

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1. *Introduction*

Recent years have brought the proliferation of discourse on carbon capture and storage (CCS) as well as hydrogen. The rise coincides with states introducing policies to meet the commitments they articulated as a part of the 2015 Paris Agreement, hinting at the Global Community's ambition to accelerate climate action. Fossil capital found itself on the defense, as focus turned to greenhouse gas emission reduction targets and the climate policies that would enable these. The period was not altogether unfamiliar as entrenched interests have faced similar challenges, be that during the launch of globally concerted climate action following the 1988 Toronto Conference on the Changing Atmosphere, the signing and implementation of the 1997 Kyoto Protocol, or the *Energiewende* and the rise in renewable electricity generation it induced. These all reflected climate action's momentum, which would be obstructed. Fossil capital has endured and adopted meticulously crafted low-cost, high impact strategies to delay climate action or maintain its relevance in discourse on the future energy system – CCS and hydrogen is yet another manifestation of its response. This essay identifies and discusses four themes in the strategies deployed by fossil capital and their context to explicate the rationale, approach, and shifts in strategies.

Fossil capital has been forced to introduce some indication of change that reconciles sustaining fossil fuel combustion-based practices and an answer to the climate and, more broadly, environmental crisis. To ensure its sustained operations, it must resolve the tension between *accumulation* and *legitimation*.[1] Entrenched interests have shown little inclination to fundamentally shift away from the high

[1] Paterson 1996.

profitability of coal and hydrocarbon exploitation.[2] Instead, fossil capital has deployed tools to extend the viability of their activities.[3] I refer to these as the three-Ds and they include: (1) denial and dilute, (2) decarbonise, (3) deflect. This draws on Vettesse's (2019) argument that identifies a three-pronged strategy – deny, marketise, and geo-engineer – to which I add novel technologies that broadly speaking can decarbonise combustion processes. This essay provides a birds-eye overview and a periodical delineation of shifts between these strategies, their overlaps, and implications for climate action. It is meant to offer a guide to help structure one's understanding of fossil capital's approach to accumulation versus legitimacy with an emphasis on the currently dominant technological fixes.

2. *Fossil capitalism*

Capitalism tends to be understood as a socio-economic system where there is a private ownership of the means of production and is based on the systematic exploitation of the labour force. Already Marx, who paved the foundation for the analysis of capitalism looked beyond this and hinted that this is not merely a socio-economic system, but rather a socio-ecological one.[4] Scholars tended to focus on the social component of his work, which comprises the overwhelming majority of his thought, but there are indications in his early writings, be that in *Capital* or *Grundrisse*, that he did not entirely forego an analysis of the social-environment nexus. He paraphrases William Petty in stating that "labour is its [material wealth's] father and the earth its mother" (Marx, 1887) as an oft-cited point of departure, while going on to explore the role of land in agricultural production.[5] However, he would go beyond this in the later years of his life, when he took an interest in the natural sciences and began to theorise how environmental limitations may inhibit the expansionary logic of capitalism.[6] Marx was not yet in a position to interpret and theorise the role fossil fuels would come to play, given that he wrote most of his work at the dawn of fossil society. Nonetheless, he

[2] Llavero-Pasquina and Bontempi 2025.
[3] Malm and Carton 2024.
[4] Foster 2000.
[5] Saito 2017.
[6] Saito 2023.

already perceived "nature" to be the "original tool house" of humans, the basis of their inorganic body, from which they drew on the resources with which they could expand the scope and extent of their productive activities.

The inherent expansionary logic of capitalism led the environment to become "more and more transformed into a contested object of human greed".[7] The emergent system was ever-expanding and ever-hungry for energy resources.[8] Fossil fuels would become especially pertinent, given their high energy and power density that could be unleashed to power the technological innovations introduced during what would become the Industrial Revolution. It also enabled capital to tap into a larger agricultural and dispersed workforce, increasing control through urbanisation (Malm, 2016). The uptake of fossil fuels also allowed capital to overcome the intermittency of traditional renewable energy – hydro power and wind mills – and the limited access to biomass, which would later be accompanied with access to fossil fuel-based lighting that enabled production and thus the extraction of value from labour around the clock.[9] Fossil capitalism emerged as a social system which most prominently features the "*self-expanding value passing through the metamorphosis of fossil fuels into CO2* [italics in original]".[10]

Confines to the metamorphosis of fossil fuels were effectively absent until the need to take climate action was articulated by the Global Community. This jeopardised fossil capital's model of value extraction, leading interests to deploy strategies that could enable their continued fossil fuel-based accumulation by acquiring the social legitimacy necessary to sustain their actions. Key to their actions was what Antonio Gramsci (1971) referred to as "war of position": a long-term strategic struggle in civil society to build cultural and intellectual power that can be used to legitimise exploitative practices. This can take one of two forms according to the Italian Marxist thinker, namely *transformismo* and *expansive hegemony*, the former reflecting a method to co-opt and neutralise opposition by absorbing radical ideas into prevalent structures and thus neutralising them, while expansive

[7] Altvater 2007, p. 38.
[8] Hornborg 2001.
[9] Nordhaus 1998.
[10] Malm 2016.

hegemony is when a political faction wins the consent of subordinate groups by creating a broad collective national-popular will that incorporates their aspirations. In the following, I explore the strategies fossil capital deployed to ensure such outcomes.

3. *Deny and dilute*

Fossil capital was not confined by planetary boundaries until the middle of the twentieth century. Carbon-dioxide was an overlooked issue and the pollution that came with the production and combustion of fossil fuels was written up as the price of progress. Some aspects were regulated or addressed to ensure the legitimacy of the system, be that through local regulations or through national regulations that largely emerged during the twentieth century,[11] such as England's support for 'smokeless fuels' (i.e. coke or *de facto* coal gas) in response to the Great Smog of London or legislative action in the USA following the 1969 Santa Barbara oil spill. Carbon emission would only rise on the scientific agenda in 1970s, following which it received more pronounced attention from politicians and policy-makers – see e.g. the Villach Conference in 1985 (ISC, 2018). The combined impact of the Brundtland Report in 1987 alongside James Henson's congressional hearing, the Toronto Conference, and the establishment of the International Panel on Climate Change (IPCC) all in 1988 lifted the matter to become a prominent item on the global political agenda.[12] States sought to take climate action but without pivoting from fossil capitalism leading to the emergence of a "global governance for sustainable capitalism" and prompting action on behalf of fossil fuel interests.[13]

Fossil capital responded to climate action through what was the lowest cost mode of action: denial. It spread misinformation through a concerted public relations campaign that would sow doubt and shape the leaders' and the general public's approach to the global warming challenge as well as underscore the high costs of taking action.[14] Messaging by fossil capital (e.g. the American Petroleum In-

[11] Fressoz 2024.
[12] Jäger and O'Riordan 1996.
[13] Paterson 2010, p. 110.
[14] Oreskes and Conway 2011; Nuccitelli 2013; Franta 2018; Brulle 2023.

stitute [API]) had begun already in the late-1970s,[15] but the prospect of action following the 1988 Toronto Conference prompted fossil capital to establish the Global Climate Coalition (GCC) (1989-2001) in addition to the International Petroleum Industry Environmental Conservation Association (IPIECA) (1974-current). These organisations funded and popularised research that underscored the lack of conclusive evidence or the outright denial of climate change[16], despite founding members having a strong knowledge on the impact of rising carbon-dioxide levels. The GCC was also active in underscoring essential role of fossil fuels and costliness of taking action to favour the sustained exploitation of fossil fuels through prominent platforms that shaped policy, such as Congressional testimonies in the US.[17] By emphasizing the negative impacts of climate action, perpetuated expansive hegemony in that it could legitimise its actions through the essential role of fossil fuels.

The emergence of a global climate agenda with the Rio Conference in 1992 and the Conference of the Parties (COP) launching discussions on climate action in Berlin in 1995, amplified fossil capital's obstruction of climate action through the destabilisation of scientific consensus and respective communication, sowing confusion and prolonging meaningful action.[18] Communication emphasising the high costs of action became prominent in the US, underpinned by fossil capital-funded work undertaken by scientists and consultants, among others.[19] Fossil capital ramped up its efforts to delegitimise scientific findings sponsoring studies, exaggerating the costs of climate action all the while ignoring the costs (and broader impact) of inaction. The efforts were successful in that it managed to undermine the ratification of the Kyoto Protocol, despite this reflecting a much less stringent carbon reduction framework than the outright cuts proposed by the EU in Toronto or the carbon taxes discussed as an alternative. Fossil capital was thus able to shape the climate agenda from early on through the promulgation of discourse, legitimising the continued use of fossil fuels.

[15] Franta 2022.

[16] This includes, the since falsified work of John Christy and Roy Spencer, for instance, which suggested that the global temperatures were cooling as opposed to warming, or the work of Dr. S. Fred Singer and Dr. Patrick Michaels.

[17] Brulle 2023.

[18] Ekberg *et al.* 2022; Brulle 2023.

[19] Franta 2022.

The contours of a policy framework began to materialise led by the EU, which undertook the development of the largest emission trading system in the early-2000s. The reception of marketizing emissions was mixed, but "[p]olluting industries see the potential for massive financial rewards in return for their participation" in addition to which "[a] clear aim has been to implement emissions control without impairing industrial competitiveness".[20] The abundance of quotas that suppressed prices ensured that the ETS had little-to-no impact on polluters, which was further suppressed with the economic turmoil ensuing the 2007 market crash. And, the logic of the ETS – to shift consumption practices from more to less polluting forms was presumed to move states from more to less carbon-intensive fuels, in practice this suggested that fossil gas be favoured over coal as renewable energy sources were far from competitive. The first half of the 2010s brought a marked shift through the rising competitiveness of renewables.[21] Germany's reinvigorated *Energiewende* and Spain's support for renewable energy provided momentum for the technologies, the costs of which China would compress through economies of scale. The prices of wind turbines and solar photovoltaics steeply declined as their modularity allowed for efficiency increases and they were on a clear trajectory to challenge fossil fuel-based electricity generation. Fossil fuels were still necessary to meet demand, but political momentum to pursue further climate action materialised (UN, 2015).

4. *Decarbonise: CCS + hydrogen*

The sustained political will to limit the devastating impact of climate change combined with the competitiveness of renewables entailed that fossil capital could no longer merely contest climate action but had to propose a constructive role to obstruct a shift to a fossil fuel-less society. Interests took some divestment measures and invested relatively modest sums in green technologies,[22] but overpowering this was an interest in technologies that would allow fossil capital to sustain the exploitation of the resource base it controlled (i.e.

[20] Spash 2010, p. 177.
[21] Sivaram 2018.
[22] Bauer *et al.* 2018; Fattouh, Poudineh and West 2019; Halttunen, Slade and Staffell 2023.

continue accumulation) but pair this with (promises of) technologies that decarbonised these. The prime technological solution suggested by fossil capital as a technological fix was carbon capture and storage (CCS) – emissions that would otherwise enter the atmosphere could be captured and stored indefinitely between geological formations or sequestered via various chemical reactions.

CCS draws on technology with which oil and gas producers have ample experience, as they have deployed it since the 1960s for enhanced oil recovery (EOR) to boost oil production.[23] Nonetheless, the idea of CCS to limit emissions has been an object of discussions since the late-1970s. Most prominently, the Cesare Marchetti-led (1977) long-term energy modelling at the influential International Institute for Applied Systems Analysis (IIASA) considered it as a solution in their analyses, but it would be yet another two decades for the technologically to be pioneered at an industrial scale at the Sleipner field (Norway) in 1996 and Weyburn-Midale field (Canada) in 2000. CCS has since been heralded as essential to meeting global targets (IPCC, 2021, 2022), allowing for large scale emission reduction targets alongside the continued use of fossil fuels – reconciling fossil fuel use while decarbonising their combustion. It has since become integral to climate models and features prominently in the technological endeavours of fossil capital; albeit, projects have systematically failed.

CCS has not scaled as had been promised or anticipated, despite receiving ample funding from states.[24] Fossil capital may have regularly underscored its familiarity with CCS and its potential to mitigate climate change, but the price of carbon has not prompted a large-scale investment in the technology leading companies to rely on public funds, which have also failed to boost the technology's development as anticipated – see e.g.: (European Court of Auditors, 2018). Meanwhile, the projects that were approved have faced numerous challenges and have not underpinned confidence in the technology. A central element in its costs is the lack of modularity, which has been regularly shown as essential to price reductions in green technologies (e.g. solar photovoltaics), but while CCS may offer the prospect of large-scale project each site for storage and thus the technology deployed somewhat differs, impeding the potential to deploy it as scale. Despite the

[23] Ma *et al.* 2022.
[24] Wang, Akimoto and Nemet 2021.

need to expand CCS to meet demands featured in long-term energy scenario models,[25] challenges indicate that it may be a costly "distraction" (Buck, 2023). Nonetheless, it has remained a mainstay of fossil capital's narrative on tackling decarbonisation. CCS was respective interests' first "constructive" contribution to the energy transition by introducing the prospect of low carbon fossil fuel consumption that could reconcile prevalent social relations with emission reduction targets. However, it largely remains a hypothetical contribution.

Fossil capital's subsequent technological fix was hydrogen. As the diffusion of renewable electricity generation capacities increased, policy-makers' focus shifted to the limits of electrification.[26] And, thus began a wave of hype in relation to hydrogen,[27] which was discussed as a solve that could be deployed to meet a broad array of energy demand. This hinged on this energy carrier's relatively high energy density and the prospect that it could be deployed in a manner similar to fossil gas, meeting demand in similar applications and utilising existing infrastructure. The underlying material relations indicated a push from the fossil gas infrastructure actors (most prominently) to have policy-makers include hydrogen into their energy plans allowing for their sustained role in the global energy system.[28] Fossil capital more broadly was supportive because hydrogen may have carried the long-term prospect of being produced from renewable energy sources via electrolysis, but at the time these interests dominated the supply chain as they met demand from refineries, fertiliser production, and a handful of other industrial applications by steam methane reforming fossil gas (IEA, 2019). Hydrogen thus emerged as the "Swiss army knife" of the energy transition, but a knife that was controlled by fossil capital and with which they aimed to carve out their future role in the energy system.

The promise of hydrogen became integral to discourse on the energy transition, but its energy-related application was only prospective and also hinged on CCS. Fossil capital's proposition was to that it would explore the production, transit, and consumption of hydrogen – supported by public funds – while society's energy needs would

[25] Kazlou, Cherp and Jewell 2024.
[26] Eurelectric 2018; van Hulst 2018.
[27] Frowijn, Baneke and Kramer 2025.
[28] Szabo 2022.

continue to be met from fossil fuels. As it developed technologies necessary for hydrogen, current demand could be shifted to hydrogen produced via steam methane reforming (i.e. from fossil gas), which could gradually be decarbonised with the deployment of CCS, before the global energy system shifts to renewable energy-based hydrogen. The proposed energy transition trajectory thus sustained fossil capitalism, offering a solve to meet energy demand in a low carbon form that enabled the continued accumulation of capital based on the exploitation of fossil fuels. Its initial role was deeply overblown as fossil capital sought to capture markets, but the energy inefficiencies linked to its production and consumption would gradually lead to the thorough reconsideration of where it could be deployed.[29] The consensus that hydrogen would be needed in some applications underpinned the credibility of deploying hydrogen and developing respective value chains, but CCS-related limitations would entail that fossil capital's role remain prospective.

5. *Deflect: geoengineering*

Fossil capital's fifth tool that could help reconcile accumulation and legitimacy would be to deflect the impact of fossil fuel combustion through geoengineering. This could enable the continued exploitation of fossil fuels without necessarily worsening climate change. Solar radiation management (SRM) is the most oft-discussed method with which rising temperatures could be reversed relatively quickly and at what is presumed to be a relatively low cost solution to this end. This would entail diffusing aerosols into the atmosphere to enhance the deflected sunlight, impeding the latter's ability to reach the Earth and thus warm the planet's surface. Details on the matter are sketchy, as the ethics of even experiments have been highly debated as its feasibility and the risks involved are also contested.[30] SRM has been discussed as an act of last resort that could help alleviate unbearable temperatures – see Kim Stanley Robinson's (2020) *Ministry of the Future* for a fictionalised description of what may lead to the technology's deployment – to gain time to mitigate climate change. Mitigation may however not follow as the SRM can emerge

[29] Johnson *et al.* 2025.
[30] GCSA 2024; Buck 2019.

as a potentially low cost solution by ensuring the prospect of maintaining the fossil fuel-based status quo while dampening the most devastating effects of climate action.[31] That is, it can reconcile the legitimacy of fossil fuel-based capital accumulation while limiting some of climate change's impact – which, in principle, could garner support for the deployment of the technology by some political factions. However, this remains the most speculative of the strategies, given its nascency.

6. *Concluding thoughts*

Fossil capital is pushing up against the physical boundaries to its expansion by exacerbating climate change and prompting social resistance as it renders the Globe uninhabitable. The limits to its fossil fuel-based capital accumulation have materialised, but interests have introduced strategies to reconcile the legitimacy fossil fuel combustion and climate action. They have deployed a three-pronged approach: deny and dilute, decarbonise, and deflect. In so doing, it has pursued an expansive hegemony through the introduction of means that reconcile prevalent practices and the need to limit the impact of climate change. Denial was the first strategy deployed, with an emphasis initially on outright contest climate science only to gradually shift to emphasize the high costs of taking action – never mentioning the costs of inaction. This intervention was largely discursive and relied on the dissemination of information that was based on dubious or false scientific results aimed to contradict climate science. This carried a lasting impact, but the physical effects of climate change and mounting scientific evidence forced a shift in strategy to emphasize the high costs of inaction, through which fossil capital could garner support for its sustained action. In parallel, the emergence of a global climate agenda and national actions prompted measures to dilute actions, be that by targeting specific national policies (e.g. lobbying the US to not ratify the Kyoto Protocol) or by becoming involved in global climate governance (e.g. participation at COPs). Denial and dilution carried limitations as social pressure to take climate action led fossil capital to play on a more "constructive" role in the energy transition.

[31] Malm 2022.

Fossil capital's legitimacy hinged on establishing its role in the energy transition and a low carbon energy system by providing the means to decarbonise. It introduced two interlinked tools to this end: CCS and hydrogen. Pairing fossil fuel combustion with CCS could allow respective interests to profit from the continued exploitation of fossil fuels as well as the technology and services related to CCS. It also provided states and consumers with the prospect of a tool that could square the proverbial circle, allowing states, capital, and communities to meet climate targets while not having to disrupt the status quo. The caveat is that the technology is not yet technologically or economically viable. It remains a prospect. In similar vein, hydrogen has underpinned the continued legitimacy of various strands of fossil fuel-based capital accumulation (e.g. fossil gas production, maintaining a pipeline system). It provides the prospect of a low carbon source of energy that can meet demand in difficult-to-decarbonise sectors, but its deployment hinges on scaling CCS, another prospective technology. Finally, deflection strategies related to geoengineering which is yet another prospective tool to reconcile fossil fuel combustion with fossil capitalism. However, this is also deeply contested and introduces numerous risks, while, once again, providing the prospect of reconciling the contradiction of fossil capitalism and climate change. Thus, strategies may be shifting, but a key commonality is that the legitimacy of continued action hinges on prospective technologies and actions, shifting the burden of proof to the future.

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Neither monist nor dualist: Real subsumption and concretization between Marx and Simondon… in the Anthropocene

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Abstract

In Karl Marx's Ecosocialism (2017) and Marx in the Anthropocene (2022), Kohei Saito argues against Hegelian dualism and substance monism in favor of what he terms Marx's "methodological dualism," which is an attempt to determine the excluded middle of this dichotomy. In this presentation I want to make the case that, while this task is admirable, Saito ultimately fails to provide an adequate alternative to monism and dualism for two reasons: first, his dedication of a transhistorical form of abstract labour and the human body binds him to a quasi-essentialist notion of Marxist humanism that maintains a hylomorphic division between form and matter; and second, he lacks a sufficient conceptual framework for moving away from this dichotomy, instead mixing or mediating their difference. I proceed in two parts. First, I provide an account of Saito's methodological dualism, and what I see as its limitations, through his understanding of real subsumption. Second, I suggest that Gilbert Simondon's conceptualization of metastability, abstraction, and successive concretization provide a better starting point for an alternative to the monism/dualism dichotomy. Furthermore, I offer some initial ruminations on how Simondon's account of technology could work towards something like an oblique rendering of Saito's degrowth.

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Keywords: Anthropocene, Continental Philosophy, Real Subsumption, Marx, Saito, Simondon

1. *Introduction*

In *Karl Marx's Ecosocialism* (2017) and *Marx in the Anthropocene* (2022), Kohei Saito argues against Hegelian dualism and substance monism in favor of what he terms Marx's "methodological dualism," which is an attempt to determine the excluded middle of this dichotomy.[1] In this presentation I want to make the case that, while this task is admirable, Saito ultimately fails to provide an adequate alternative to monism and dualism for two reasons: first, his dedication of a transhistorical form of abstract labour and the human body binds him to a quasi-essentialist notion of Marxist humanism that maintains a hylomorphic division between form and matter; and second, he lacks a sufficient conceptual framework for moving away from this dichotomy, instead mixing or mediating their difference. I proceed in two parts. First, I provide an account of Saito's methodological dualism, and what I see as its limitations, through his understanding of real subsumption. Second, I suggest that Gilbert Simondon's conceptualization of metastability, abstraction, and successive concretization provide a better starting point for an alternative to the monism/dualism dichotomy. Furthermore, I offer some initial ruminations on how Simondon's account of technology could work towards something like an oblique rendering of Saito's degrowth.

2. *Saito's methodological dualism and real subsumption*

Saito's attempt to mitigate both Hegelian dialectical and monistic flat ontologies is found in his reading of the distinction between formal and real subsumption in Marx's *Capital*. As Saito describes it, "real subsumption" introduces a more intertwined and entangled understanding of the productive forces and relations of production. Traditionally, historical materialism takes the productive forces of capitalism, by which I mean the tools, machinery and human labour

[1] In doing so Saito largely understands himself aligned with Andreas Malm and Alf Hornborg (2014) in providing an "analytic distinction" between nature and society.

created and used by capitalism, as independent variables of the relations of production (Saito 2022, 154). Ergo, the productive forces of capitalism could be appropriated by socialist relations of production. Technological innovation in capitalism is, thus, treated as a good thing. Saito is critical of this understanding because it does not account for the real subsumption of the productive forces under capitalism. He notes that "formal subsumption" is an important aspect of the capitalist appropriation of precapitalist labour processes. Formal subsumption describes the formal appropriation of previous productive forces under capitalist logics. Yet, formal subsumption maintains an extrinsic division where the social form [*Form*] and economic material [*Stoff*] "remain external to each other" (2022, 146). The material, productive processes are not yet specific to the social form of capitalism. It is only when the productive forces become mixed with the relations of production – a process wherein cooperation emerges as a productive force unique to capitalism – that genuine capitalist accumulation (and not primitive accumulation) emerges.[2] To quote Saito, "real subsumption changes both the technological composition *and* the social relations of production" (2022, 148, emphasis in original).[3] Productive forces and social relations are mixed under the mode of production.[4] Thus, he claims, neither standard theories of monism nor dualism are sufficient for historical materialism as both form and matter are necessary, but cannot be thought independently of their mixture in real subsumption. For Saito, it is not possible to formally

[2] Marx's discussion of real subsumption occurs in an unpublished work titled, "Results of the Immediate Process of Production," which is often thought to be the sixth chapter of *Capital.* Here, he writes,

> The general features of the *formal subsumption* remain, viz. the direct *subordination of the labour process to capital,* irrespective of the state of its technological development. But on this foundation there now arises a technologically and otherwise *specific mode of production – capitalist production* – which transforms the nature *of the labour process and its actual conditions*. Only when that happens do we witness *the real subsumption of labour under capitalism* (Marx 1990, 1034-1035).

[3] I'm not convinced Saito's description is accurate given that in Marx real subsumption can only occur on the foundation granted by primitive accumulation. Thus, the formal determination is necessary for a secondar 'real' determination. Such an account is inherently hylomorphic in the sense of Aristotle.

[4] Earlier Saito writes, "The concrete labor process, as an incessant metabolism between humans and nature, is radically modified by the logic of capital" (2017, 97).

appropriate the capitalist productive forces under socialism because the capitalist forces of production *necessarily* lead to the domination of nature and environmental destruction. Formal appropriation only produces a formal subsumption of capitalist productive forces. For Saito, it is necessary to transform both the relations of production and the productive forces, which are entangled and intertwined, towards environmental restoration. One cannot reduce real subsumption to form or matter.[5]

The role of form [*Form*] and matter [*Stoff*] is central to Saito's reading of the "metabolism" [*Stoffweschel*] of humans and nature, wherein he centres materiality [*Stoff*] in the natural process (2017, 60). Saito argues, for instance, that the rejection of ecology in Western Marxism has been driven by an erasure of "material." For example, he writes,

> Among Marx's writings, it is possible to find various clear arguments that indicate his strong interest in ecological problems. If the statement that Marx's ecology is only of secondary importance for his critique of political economy was accepted as convincing for a long time, the reason can be partially found in the tradition of Western Marxism, which primarily dealt with social forms (sometimes with an extreme fetishism of Hegel's *Science of Logic*), while the problem of 'material' or 'content' was largely neglected. If the 'material' become integrated into his system, Marx's texts open the way to ecology without much difficulty (2017, 262).[6]

Unfortunately, I find that this positioning of materiality – as affected through its interconnection with formal, social determination – often lacks a reciprocal dimension. This is likely due to Saito's understanding of the metabolic process (2017, 15), human body (2017, 65) and abstract labour (2017, 103) as "transhistorical." By transhistorical, Saito does not mean that there is no change. For example, real subsumption occurs as a historical, socio-economic, and formal determination that interrupts and transforms those transhistorical, natural processes.[7] This mediation of metabolism through distinct, historical

[5] This is clearer in *Marx in the Anthropocene,* given that the emphasis of material production in *Karl Marx's Ecosocialism* can often be read as a unilateral material determination of form.

[6] It is not worth dealing with this misrepresentation of Hegel here.

[7] Thus, for Saito, abstract labour is both physiological and transhistorical. This claim has been quite thoroughly critiqued by drawing upon the work of thinkers like Isaak Illich Rubin, Michel Heinrich, and Moise Postone (Jones 2024).

forms is qualitatively distinct but remains and maintains an integral, transhistorical process. Saito treats this distinction as sufficient for providing an understanding of "alienation" that moves away from the form of philosophical alienation that is found in both Feuerbach and the early works of Marx (2017, 28).

Here I have some concerns. I find it difficult to read Saito's project as anything but an extension of Marxist humanism (including its implicit dualism). His theory of "degrowth" strikes me as, fundamentally, the de-reification of an alienated, though natural and transhistorical, metabolic process. For Saito, capitalist society historically alters this transhistorical, material reciprocity. This "alienation of nature," as he puts it, must be overcome.[8] On this basis, the claimed methodological dualism implicitly introduces two simultaneous divisions: a first, metabolic dualism, as the transhistorical reciprocity of humans and nature; and a second, in the metabolic rift, where this transhistorical process is fundamentally altered by the historical process of capitalism through real subsumption. It is the latter division which maintains a dualistic function. For Saito, this historical determination of the metabolic rift fundamentally alters the "content" but not the "form" of the transhistorical metabolism, which must be emancipated from capitalist reification. This rendering results in understanding the alienation of nature as the dissimulation of the transhistorical metabolic dualism by the historical metabolic rift. The material process identified with metabolism is transformed through an economic, *formal* determination: form determines and transforms matter. It is worth quoting Saito on this point: "The cause of modern ecological crisis is not the insufficient level of technological development but *economic form determinations of the transhistorical process of metabolic interchange between humans and nature"* (2017, 133, emphasis in original). Despite Saito's insistence on the material determination of formal development, the metabolic rift (and real subsumption more gener-

[8] Saito writes "the unity of humanity and nature exists transhistorically from an abstract general perspective, in that human labor not only always modifies nature, but is also a part of nature and conditioned by it. What Marx's analysis shows is the *historical* deformation of the relationship between humans and nature in modern capitalist society, which is based on the alienation of nature. Marx investigates, as the primary task of his political economy, how this material condition of social production is transformed and deformed under capitalistically constituted social relations. (2017: 258-259).

ally) is understood as form determinations on material reciprocity. I would suggest that this position is fundamentally dualistic,[9] given its maintenance of form and matter through their mediation. Material, *qua* metabolic process, is subsumed under the form of capitalist relations, only to be subsequently transformed under real subsumption. This is a formal determination of material development: a formal relation determining material transformation. Saito's overall aim, which he describes as a "rehabilitation of the humans-nature relationship through the restriction and finally the transcendence of the alien force of reification" (2017, 133) suggests that he wants to emancipate the transhistorical metabolic (material) process from historical (formal) determinations. That is, to emancipate the alienated transhistorical reciprocity of the metabolic dualism, or "matter", from the historical metabolic rift, or "form," which ruptures it in producing environmental destruction.

3. *Concretization, rather than formal determination, in Simondon*

In the remainder of this presentation, I will suggest that Gilbert Simondon provides a stronger conceptual alternative than Saito is able to generate. In the first chapter of *On the Mode of Existence of Technical Objects,* Simondon (2017) provides an account of the genesis of technical objects as a process from abstraction to concretization. "Genesis" refers to the process of individuation. The genesis of technical objects does not focus an individual object, *hic et nunc*, but the process of successive technical generation in becoming. Genesis proceeds from abstraction to concretization. By "abstract," Simondon refers to a system where parts are functionally distinct. Abstract systems are open because any sub-ensemble can be replaced, improved, or altered. This makes abstract system unstable, as each part is isolated. If one part fails, the entire process is disrupted. The "concretization" of abstract systems moves through successive iterations as sub-ensembles become coherent and unified. Concrete technical objects are more capable of self-organization, almost like nature objects. Concretization leads to stability and increases in speed and

[9] And vulgarly Hegelian, though Hegel provides a much more integrated and interesting understanding of both 1) the relation of form and matter, and 2) individuation. See Vangeest (2024).

efficiency. Yet, there is less room for innovation outside these closed technological parameters. Sub-ensembles are less functionally distinct in becoming concrete.

Ian Angus (2019) links real subsumption in Marx with concretization in Simondon. He notes that while there is fundamental disagreement between Simondon and Marx regarding technical development, there is a great deal of convergence.[10] Angus suggests Marx's analysis of technical development might fit into Simondon's schema of concretization (albeit being more linear than Simondon would suggest). To simplify, consider the distinction between form and matter under formal subsumption as formally distinct and open. Via real subsumption, this relationship is increasingly unified and concretized. Marx and Simondon both take this as a technical process, with cooperation becoming a technical necessity as concretized through real subsumption. The concern for both becomes the production of a "qualifiedly new technology" that would radically break from capitalist concretization. What must be determined is how such an analysis squares with Saito's understanding of "degrowth." For Saito, destructive technologies remain destructive under any form of ownership (2022, 158). How might one conceive of postcapitalist technologies that are not inherently destructive to the environment? Is it possible?

Concretization provides a starting point. Like Saito's account of real subsumption, the movement from abstract to concrete provides an understanding of a system becoming more functionally integrated. Unlike Saito, who maintains a formal distinction between the transhistorical (matter) and historical (form), and thus remains functionally dualistic (and hylomorphic) in his analysis, Simondon's work on the relationship of humanity and technology provides a reciprocal account that focuses the relation as determinate of its parts, rather than the inverse. By focusing the relation rather than any individual part, Simondon offers an account that is neither monist nor dualist. This account centres the development of "metastability." While philosophy has historically understood material being as stable, and only changed on the basis of formal determinations,[11] the advent of

[10] Angus notes that while, for Marx technics is determined by socio-economic forces, Simondon takes concretization as the basis for socio-economic standardization.

[11] Ergo hylomorphism, wherein a stable being is changed through the imposition of a formal determination.

quantum mechanics provides evidence of a metastable system. The microphysical scale consists of potential energy, which cannot be determined as form nor matter, given that both form and matter are "*adequate only to individuated reality*" (Simondon 2020, 6, emphasis in original). Metastability describes the "*ongoing activity of individuation… a system that is in the midst of undergoing the process of individuation*" (2020, 7, emphasis in original). As Muriel Combes (2013, 85) notes, metastability breaks from the form-matter distinction and any dualist account by instead providing parameters for individuation. Metastability should not, however, be considered monistic (at least in the sense that Saito uses the term),[12] given that it provides an account of the interaction of distinct phases of being (such as physical individuation, biological individuation, psychological individuation, and collective individuation), which iteratively affect each other but are neither collapsed nor mixed. A central example is that of the "transindividual," which is conceived neither in terms of an individual nor a collective but as the instantiation of their resonance or rapport. Transindividuation arises "at the intersection" of two individuations: the individual and the collective (Combes 2013, 34). Individual and collective individuations are concretized, becoming less and less functionally distinct. The concretization of these distinct phases of individuation consists in the resolution of metastable potentiality that arises through their resonance or rapport. Briefly, this means that there are two or more phases of individuation, which increasingly resonate through concretization. The rapport formed through (and because of) this concretization consists in preindividual potentialities or metastability. These potentialities allow development in each phase of individuation, despite never collapsing the distinct phases. Against Saito, we cannot consider the emancipation of one phase from the other. To do so would be to centre a phase (whether the historical or transhistorical) as primordial to the relation. Matter is not determined by form, nor the inverse. Form and matter emerge from their mutual integration, which is prior to either's instantiation. Rather than emancipation from alienation, the process of alienation itself is what must be transformed.

[12] It strikes me as perfectly reasonable to consider Simondon a substance monist. His position does not, however, collapse the distinction between 'nature' and 'culture,' as Saito's use of the term 'monism' seems to imply.

To close, I'd like to note two ramifications of this alternative regarding Saito's project. First, I would suggest that Simondon allows for a more robust conceptual alternative to the monist/dualist dichotomy. While Saito appears content to either mix or mediate form and matter, the conceptualization of metastability in Simondon stands outside the form/matter pairing. This alternative provides a reciprocal account of the iterative impact of phases of being upon each other without reducing or mediating them. Neither humanity nor nature, nor their imbrication, is taken as given or transhistorical. Nothing can be rescued from the dissimulation of alienation. Instead, these can be taken as distinct phases of individuation that mutually affect each other through their increasing concretization. Such an account allows for the historical development of humanity and abstract labour without collapsing, mixing, or mediating (as occurs in dualistic frameworks).

Second, I think that Simondon could allow for a more robust, yet "non-Promethean" approach to the relationship of humanity and technology. This approach might be placed in line with Saito's scant descriptions of a more 'open' technology, though it would be helpful if this open reading of technology was emphasized against his more pessimistic rendering, which take technological development as necessarily destructive and posit degrowth as a withdrawal from technological progression. Simondon recognizes the successive concretization of humanity and technology as necessary for the iterative development of both humanity and technology (Simondon 2010, 235). The metastable potentiality of humanity and technics emerges through their concretization and resonance (Simondon 2015, 23). This would suggest that Saito is correct in recognizing capitalist technology as unique to the capitalist social form. Yet, it would also suggest that, rather than the formal appropriation of capitalist technology, the determination of a new social form requires the development and deployment of new technologies unique to that form. To a certain degree, one might also argue that the formal adoption of degrowth is insufficient for the instantiation of degrowth: it requires degrowth technologies. What I am suggesting – and I think this final point is quite at odds with Saito – is that the move beyond capitalism would require the production of technologies that would concretize with humanity in ways distinct from capitalist concretization. Such technologies would necessarily need to produce something distinct from humanity as it is

concretized under capitalism. Neither humanity nor the human body could be taken as transhistorical. Perhaps, and here I offer a rejoinder to the title of this panel,[13] post-capitalist technologies offer resonance to the development of something *post-human*. What this would mean is that in the same way that capitalist technology cannot simply be formally appropriated towards post-capitalist society, so too might we suggest that humans, as conditioned and concretized under capitalism, cannot simply be formally appropriated towards post-capitalist society. This is neither the emancipation of humanity from technology, the emancipation of a transhistorical essence from a historical development, nor the emancipation of matter from form. Instead, it is the transformation of humanity and technology – a transformation of *Stoff* and *Form* – towards a different ecological future no longer bound to growth.

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Taxing Typologies: Re-examining the Development of Contemporary Ecosocialism

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Abstract

In this paper I critically consider a typology that has gained preponderance in eco-socialist discourse and among metabolic rift scholars, specifically. This typology maintains that more primitive first-stage eco-socialists floundered because they believed Marx was not an ecological thinker. Second-stage eco-socialists claim to have overcome this by returning to Marx's work and highlighting his ecological interest, centered around the idea of the metabolic rift. Metabolic rift theory is now allegedly fully embraced by third-stage eco-socialism which seeks to apply it more concretely.

I argue that the abovementioned typology, whilst not fully unjustified, canonizes metabolic rift theory and presents first-stage eco-socialism as outdated and misinformed. This is an issue because it can lead to intellectual rigidity, preventing us from attending to crucial insights provided by first stage eco-socialists which might be overlooked by metabolic rift scholars. This includes the importance of extra-economic and political facets of capitalism, as highlighted by André Gorz and Joel Kovel. These authors show how the state mediates access to, and the destruction of, natural and social conditions of production. They also explain how capital functions ideologically and comes to penetrate non-economic facets of our life-world to hinder the imagination of a non-capitalist 'otherwise'. I contend that metabolic rift scholars have not sufficiently considered these extra-economic facets of capital. Accordingly, they might not satisfactorily explain how certain social metabolic relations become preponderant and are maintained. I thus conclude that abovementioned self-canonization can hinder accurate ecological critiques of capitalism and underscore the importance of intellectual openness and self-reflexivity.

Bio: Joost Wijffels (he/they) is a PhD Candidate at Utrecht University specialising in critical theory and questions of domination, political (inter) subjectivity, and social transformation. His current research brings together ecosocialist and ecofeminist critiques to expose the limits of eco-capitalism.

Keywords: Metabolic Rift Theory, Eco-Socialist Typology, Canonization, The State

1. *Introduction*

I wish to open on a personal note. When I started my PhD on Ecosocialism, I was not too familiar with the term and what should be understood by it. While I had researched similar topics and had taken courses on both Marxism and environmentalism, I did noy see myself as an expert on ecosocialism. I thus spent the first weeks of my PhD trying to gain a better understanding of ecosocialism and its development in recent decades. As a result, I spent quite some time searching for terms like "Ecosocialism", "history of Ecosocialism" or "development of Ecosocialism". Rather quickly, these searches led me to encounter texts that provide a neat 'typology' of Ecosocialist thought, dividing its development into three neat, successive stages that all improved upon one another. And while I initially saw this typology as a useful heuristic device, I soon began to feel that this typology bears several problems.

The problems of this typology are the subject of this paper, which addresses why it would be a problem to present ecosocialism as having developed in three distinct phases. To answer this question, I open with a brief recapitulation of this typology. Whereas some have critiqued this typology for being plain wrong, I am more concerned with its 'performative effects', a term I borrow from Eve Sedgwick (1997) to denote the effects of a text on its readers and writers. Understanding these performative effects requires that we briefly take a step back from ecosocialism itself and discuss the problem of academic canonisation. Based on this discussion, I contend that the proliferation of this typology canonises the Metabolic Rift Theory, serving to present so-called 'first-stage' ecosocialist thought as misinformed, outdated, and therefore not worth seriously engaging with. This, in turn, has the performative effect of encouraging academic rigidity which prevents

us from attending to crucial insights provided by first-stage ecosocialists. As I hope to show through two examples, first-stage ecosocialists highlight several extra-economic and political factors that enable the proliferation of the capitalogenic destruction of nature. I contend that metabolic rift scholars do not always sufficiently consider those extra-economic facets such as the state, ideology, other forms of domination. I thus close by arguing that the canonisation brought about by the typology of ecosocialism is a problem because it simultaneously obscures useful contributions made by non-metabolic rift scholars and the shortcomings of metabolic rift scholars themselves.

2. *Reconstructing the typology*

It is crucial that we begin by taking a closer look at this typology I have been speaking of. Initially, the typology described a "two-stage schema" first introduced by John Bellamy Foster in 2001.[1] It was quite quickly adopted by Paul Burkett in 2006 and gained more prominence in the last 10 years, appearing in Foster and Burkett's 2016 *Marx and the Earth*, Foster's 2016 "Marxism and the Anthropocene", Hannah Holleman's 2015 "Methods in Ecological Marxism" and Saito Kohei's influential 2017 *Marx's Ecosocialism*. While some iterations of the typology distinguish between two stages of ecosocialism, later works typically identify three distinct stages. It makes sense, therefore, to say that the typology describes three stages in the 'coming-of-age' of ecosocialist scholarship or, in Burkett's words, "the movement towards a more deep-rooted ecosocialist theory".[2] This movement is centred, moreover, on how ecosocialist thinkers conceived of Marx's relationship to nature and ecology.

As such, we can begin to reconstruct this developmental story. According to this story, growing environmental concerns in the 70s and 80s led to the rise of so-called 'first-stage ecosocialism'. This first stage is mostly associated with authors writing around this time, including André Gorz, James O'Connor, Daniel Bensaid, Carolyn Merchant, the early Ariel Salleh, and Joel Kovel.[3] Commentators also include

[1] Burkett 2006, p. 24.
[2] Burkett 2006.
[3] Foster and Burkett 2016, p. 3.

later authors such as Jason Moore or Daniel Tanuro.[4] One distinguishing feature of first-stage thinkers is their treatment of Marx and socialism as largely anti-environmental. They read Marx as a productivist and Promethean author who had no issues with industrialisation and large-scale production but wanted to change who controlled the production process.[5] These thinkers seemed sceptical about the environmental potential of socialism, moreover, due to the poor environmental track record of socialist states. Consequently, these authors were unable to generate a thorough synthesis of environmental and socialist critiques. Rather, so Foster (2001) claims, they were "grafting" green theory onto red theory and resorted to "ad hoc formulae" with the aim of "greening Marxism".[6] The result of this reading of Marx, proponents of the typology argue, was a critique that was either insufficiently ecological or insufficiently socialist.

Certain readings of Marx thus hampered a thorough ecosocialist critique. This is precisely what the second stage of ecosocialism has been claimed to overcome in the late nineties when authors such as Foster and Burkett returned to Marx's writings.[7] Accordingly, they uncovered in Marx a much finer attunement to ecological problems and a much less Promethean dominating stance towards nature. These discoveries of the ecological dimensions of Marx's thought led to the emergence of the famous Metabolic Rift Perspective.[8] While it is John Bellamy Foster who pioneered this perspective, his work has famously been continued by authors like Kohei Saito (2017; 2022) and Hannah Holleman (2015). Other authors who have embraced this reading of Marx and are accordingly classified as second-stage thinkers include Elmar Altvater, Andreas Malm, and the later Ariel Salleh.[9] Importantly, this second stage is treated as radically distinct from the first stage of ecosocialism, having been cited as "its [first stage thinking's] antithesis",[10] as having developed "in opposition to" first stage thinking,[11] and even as a "theoretical revolution".[12]

[4] Foster and Burkett 2016; Saito 2017, p. 12.
[5] Saito 2017, p. 13.
[6] Foster 2001, p. 462; Burkett 2006, p. 24; Foster and Burkett 2016, p. 3.
[7] Foster 2016.
[8] Burkett 2006, p. 25; Holleman 2015; Foster 2016.
[9] Foster 2016; Foster and Burkett 2016; Saito 2017.
[10] Foster and Burkett 2016.
[11] Foster 2016, p. 396.
[12] Foster in Burkett 2006, p. 24.

While the relationship between first-stage and second-stage thinking is presented as radically oppositional, that between second- and third-stage thinking is treated as more continuous. Third-stage scholars have generally accepted the Metabolic Rift perspective. What sets them apart from second-stage thinkers is rather that their work consists of empirical investigations employing the Metabolic Rift framework. Examples of this include Del Weston's *Political Economy of Global Warming* (2014) or Longo's, Clausen's, and Clark's *Tragedy of the Commodity* (2015) While third-stage scholarship is distinct in its empirical rather than theoretical focus, it is claimed to mostly underscore the validity of second-stage thinking.[13] In this sense, the typology of ecosocialism describes a coming-to-maturation of ecosocialist theory in which an underdeveloped and first stage developed into a mature red-green synthesis captured by the metabolic rift perspective which finds its full fruition in an explanatory framework with empirical *and* theoretical components today.

The story I have outlined above sounds convincing and clear. But it also deserves pushback. I am not the first to do so. Some, like Michael Löwy (2019) and Rudy, White, and Gareau (2017) have maintained that the typology of ecosocialism is inaccurate and too overgeneralising. My critique, however, derives from the performative effects of this typology, or what this typology *does* to its readers and writers. More precisely, I believe that this typology effects the canonisation of the metabolic rift theory which enables, in turn, a harmful intellectual rigidity vis-à-vis other ecosocialist insights.

3. *Ecosocialist canonisation*

The claim that the typology has the effect of canonising the metabolic rift theory requires that we take a step back and examine what canonisation is. Essentially, canonisation refers to the formation of a canon. The canon, in turn, has been taken to refer to the best texts that a culture has to offer.[14] In the words of Mary Ellen Waithe, the canon is the 'crème de la crème' of a total total body of works in a given discipline.[15] While the idea of the canon stems from Christi-

[13] Holleman 2015; Foster and Burkett 2016, p. 10.
[14] Brems 2019, p. 52.
[15] Waithe 2015, p. 22.

anity, denoting the authoritative interpretations of the bible, it has evolved to apply to any collection of works taken to be central to a specific field of inquiry.[16]

Canonisation, then, refers to the active, dynamic, and collective process of determining what belongs to this so-called crème-de-la-crème of a discipline. The canon is not a static given; it is not the case that some works remain influential and authoritative on their own. Rather, scholars of canonisation highlight how *active* work is done to posit and maintain certain works as such.[17] This is also a dynamic process because what counts as canonical often changes and is subject to cultural negotiations.[18] For instance, the emergence of feminist theory and feminist historiography has questioned the androcentrism of the philosophical canon and has pushed for the inclusion of more female philosophers therein.[19] Canonisation is, moreover, a collective process as it is seldom one actor who determines the status of a text. In this vein, Brems defines canonisation as "a *collective* cultural process of value conferral upon works of literature".[20] This value conferral includes descriptive facts like the influence of texts on other thinkers or, today, one's citation index. More importantly, however, scholars of canonisation stress its evaluative and normative dimensions.[21] Canonisation creates a hierarchy of texts, where some are taken to be especially important and therefore worth discussing.

I wish to highlight two other crucial features of canonisation. First, the evaluative dimension of canonisation makes it necessarily *exclusionary*.[22] The size of a canon is always relatively limited and cannot include all works. More importantly, the evaluation of certain texts as canonical is always comparative. Canonical texts emerge out of a large body of works. Canonical texts are those judged to be better compared to others.[23] Other texts are thus presented as less important than canonical texts and will slowly fade into the background. The second feature is that canonisation is closely tied up to academic

[16] Lapointe and Reck 2023, p. 1.
[17] Westphal 1993, p. 437.
[18] Westphal 1993.
[19] Waithe 2015.
[20] Brems 2019, p. 52, emphasis mine.
[21] Westphal 1993; Graness 2015, p. 83.
[22] Waithe 2015; Westphal 1993, p. 442; Graness 2015, p. 78; Holzhauser 2021.
[23] Westphal 1993, p. 442.

status, as highlighted by Jill Hernandez (2021). Those in positions of authority simply have more cultural leverage and consequently have more power to decide what texts constitute the *crème de la crème*.[24] Moreover, those who already enjoy a relatively high status in a field are more likely to have their texts accepted into the canon.[25] This then reinforces their status, which in turn makes it more likely that their texts are discussed and circulated.[26] In this sense, canonisation constitutes a self-reinforcing cycle.

Discussing canonisation is not merely an intellectual exercise. There are concrete and important practical dimensions to the canon. What counts as the canon, for instance, tends to influence the course offerings and syllabi. Canons also influence the direction of one's research or can inform what supervisors advise their students to read and research.[27] Canonisation thus influences which views and ideas are shared by teachers, absorbed by students, and consequently shared by them with others, just as it influences which ideas remain underappreciated and suppressed (as many of us socialist scholars will likely recognise). It is for these reasons that Lapointe and Reck claim that the canon shapes philosophical and scholarly identities.[28]

Based on the above, we can say that the proliferation of the ecosocialist typology canonises the Metabolic Rift Perspective. It presents a second stage of ecosocialism as overcoming crucial shortcomings of earlier ecosocialist works and offering a better reading of Marx. It also underscores the influence of this perspective by characterising the third stage of ecosocialism exclusively in terms of an empirical application of the metabolic rift perspective. The proliferation of this typology constitutes, in fact, an act of self-canonisation, as it is exclusively metabolic rift scholars who continue to reiterate it. The result is that these scholars gain status and authority and that the metabolic rift perspective will slowly come to be seen as the ecosocialist crème de la crème that must be central to courses and syllabi on ecosocialism.

I do not object to self-canonisation per se. It makes sense to want to establish one's authority and to generate readership, especially in an age when academic work is increasingly commodified. There also

[24] Hernandez 2021, p. 5.
[25] Holzhauser 2021.
[26] Holzhauser 2021.
[27] Lapointe and Reck 2023, p. 4.
[28] Lapointe and Reck 2023.

is an extent to which this second stage did actually respond to and overcome some limitations of earlier ecomarxist scholarship. When one reads those earlier works, it becomes clear how much time was spent trying to make socialist critiques work despite the interpretation of Marx as Promethean. In uncovering the environmentalist facets of Marx's work, metabolic rift scholars have certainly lifted some of the barriers to a green-red critique of capitalism. Why, then, this intervention? Why might one nonetheless object to the canonisation proliferated by this ecosocialist typology?

4. *The problem with canonisation*

My problem with this self-canonisation lies in its exclusionary nature. In this context, the ecosocialist typology has the effect of excluding so-called first-stage ecosocialist literature and presenting these works as outdated, misinformed, and not worth discussing. Indeed, this typology implies that earlier scholarship has become obsolete due to the rise of metabolic rift theory. First-stage thinkers, according to this typology, not only were wrong about Marx but also failed to form a thorough red-green synthesis and would be better off, it seems, left behind in favour of new interpretations of Marx and the global ecological crisis.

The problem is, I believe, that this can lead to intellectual rigidity and harsh judgements as to what counts as proper ecosocialist scholarship. In general, such rigidity would be an undesirable characteristic of academic scholarship. In this context, moreover, such rigidity prevents us from attending to the insights of earlier ecosocialist theorists that remain relevant to our current global ecological crisis, regardless of these theorists' interpretations of Marx himself. Some of these insights, I show below, pertain to the social, political, and extra-economic features of capitalism that maintain an anti-ecological relationship to the natural world. I believe that metabolic rift theory does not always adequately account for these extra-economic facets. Its theorisation of a society's social metabolism largely revolves around modes of production and economic arrangements. Due to its more economistic lens, metabolic rift theory risks leaving undertheorized how extra-economic factors such as culture and politics reinforce environmentally harmful social metabolic relations. Insights of 'first-

stage thinkers' can help us understand the importance of these extra-economic factors. These insights can also be helpful, then, for metabolic rift scholars, despite their writing in opposition to them.

Let me clarify by briefly turning to two thinkers who have been classified as first-stage thinkers: André Gorz and Joel Kovel. A crucial theme in Gorz's *Ecology as Politics* (1980) pertains to the socio-political effects of the commodification of life under capitalism and how an unsustainable social metabolism is maintained. In the second chapter of his book, Gorz examines for instance how inequality and privilege work to reinforce themselves, with deleterious environmental effects. Privilege allows certain groups to buy luxury goods such as a car.[29] Working-class people will subsequently desire to obtain these goods as a marker of social status. Once a luxury good becomes generalised, Gorz argues, it ceases to be a sign of privilege however, which compels producers to make new luxury items to fulfil the social needs of the privileged class.[30] This creates a cycle of constantly expanding consumption and the production of new goods that have harmful environmental effects.[31] Not only will this increase the strain on ecosystems but it also creates a culture of consumerism which forecloses a realisation regarding the ecological destructiveness of capitalism. Gorz thus discusses quite eloquently the more social and ideological facets of our ecological crisis, including the possibilities and the existing limitations of resistance against the status quo.

Interesting insights in Kovel's work, moreover, pertain to the establishment and maintenance of capitalism's antithetical relationship to nature. Kovel locates the origin of this in a prehistorical gendered bifurcation of nature, a process by which men appropriated women in war and conquest and legitimised their subordination by presenting women as identical to nature and men as identical to culture.[32] This subordination was maintained by the creation of private property, later codified into formal class relations through law, which is protected and enforced by the state.[33] Kovel's work discusses quite intricately the relations between the state, class, other forms of oppression, and nature. The state, he argues, further amplifies sexism, racism, and

[29] Gorz 1980, p. 68.
[30] *Ivi*, p. 73.
[31] Gorz 1980, p. 69.
[32] Kovel 2002, p. 125.
[33] Kovel 2002 p. 129.

other forms of domination to maintain class inequality, protects private property, and ensures obedience and ideological identification with the status quo.[34] Not only does this maintain social inequalities that can aid capital accumulation, but it also reinforces the ecological domination and destruction implied in the patriarchal domination of women and the constant pursuit of economic growth.[35] While I do not think Kovel's work is perfect, it is interesting to consider for its more robust interest in the links between the capitalogenic destruction of nature and social inequalities that characterise our current social metabolic order.

Space limits prevent me from discussing these authors in more detail, but I hope to have shown that they do have relevant things to say about our socioecological predicament. Surely, the insights of these thinkers are not without their problems, but the rigidity proliferated by the typology prevents us from engaging them in the first place. This typology, therefore, forecloses a clearer understanding regarding the maintenance and preponderance of certain social metabolic orders. On the one hand, then, the abovementioned self-canonization can hinder accurate ecological critiques of capitalism by obscuring important insights provided by earlier scholars, whilst on the other hand, it might obscure the shortcomings in metabolic rift theory itself. The problem with this typology, then, is that it can hinder a more full-fleshed and multifaceted ecological critique of capitalism.

5. *Conclusion*

Let me briefly recap what I've discussed in this paper. I opened with a reconstruction of a widely shared typology of ecosocialism. According to this typology, which can be seen as the developmental story of ecosocialist research, first-stage ecosocialists floundered because they saw Marx as anti-ecological. Second-stage ecosocialists claim to have overcome this by returning to Marx's work and highlighting his ecological interest, centred around the idea of the metabolic rift. Metabolic rift theory is now allegedly embraced by third-stage ecosocialism which seeks to apply it more concretely. By examining some work on canonization, I have shown how this typology serves to canonize

[34] Kovel 2002 pp. 130-132.
[35] Kovel 2002 pp. 133-136.

the metabolic rift perspective as the crème de la crème of ecosocialism, working to underscore the authority of metabolic rift scholars vis-à-vis other ecosocialist theorists. Because canonization is always an exclusionary process, this typology excludes earlier ecosocialist thinking as outdated and misinformed. I have shown why this is objectionable: as my examples show, first-stage ecosocialist thinking can help us better understand the extra-economic factors that maintain an unsustainable social metabolic order which is not always considered by metabolic rift theory. The typology thus both obscures interesting theoretical insights and possible shortcomings of dominant theoretical perspectives.

One might wonder why this matters. We can also choose to simply ignore this typology or the metabolic rift perspective. I think it deserves some attention, however, because this typology is so easily available to those who look up ecosocialism. The harmful effects of this typolog are then likely to be internalized by those new to the field. On a more general note, the urgency of our current ecological crisis and recent political developments require that we resist the temptation of neatly dividing ourselves into separated theoretical 'camps'. Doing justice to our current predicament and working towards a meaningful ecosocialist transformation of the world requires, instead, receptivity to varying perspectives, even if we do not agree with them entirely.

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Why non-fossil capitalism is impossible

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Abstract

This article examines whether a non-fossil capitalist accumulation regime is feasible. Despite expanding renewable capacity, fossil fuels remain dominant, and renewables largely supplement rather than replace them. We argue that capitalism is structurally dependent on fossil energy because of its high density, storability, and profitability, while renewable energy flows are spatially extensive, intermittent, less energy-dense, and yield lower net-energy surplus. Global energy demand keeps rising and absolute decoupling of growth from resource and energy use is absent. Finance-dominated capitalism reinforces fossil dependence, as investment flows and profit rates remain concentrated in the fossil sector. Further contradictions – limited productivity gains under renewables, weaker profitability of green sectors, and intensified global competition – undermine any non-fossil accumulation regime. We conclude that a socio-ecological transformation within capitalism lacks material foundations. Any viable pathway would require disempowering capital and enabling an eco-socialist reorientation of social metabolism.

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Keywords: Capital, accumulation regime, fossil energy, renewable energy, socio-ecological transformation

1. *Introduction*

Global warming continues unabated, and the challenges facing societies are intensifying. The social metabolism based on capital accumulation has pushed Earth from the stable Holocene into the unstable Anthropocene, exposing humanity to abrupt and unpredictable Earth-system changes whose social consequences will shape all economic, social, and political dynamics.

Following the exhaustion of the global climate movement, a fossil-fuel counteroffensive emerged in the early 2020s and has since gained ground worldwide. The illusions of green capitalism have largely vanished.[1] No climate-relevant energy transition is occurring; instead, renewable energy is being added to the fossil base of capitalist economies. We are witnessing energy addition, not energy transition.

The capitalist mode of production is structurally intertwined with fossil fuels. Their advantages – easy storage, transportability, high energy density, and high energy yield – remain indispensable to the accumulation process, and investments in fossil fuels continue to deliver higher returns than those in renewables. A full replacement of fossil fuels with renewables would require a substantial reduction in total energy use. Yet global energy demand rose by an average of 1.3% annually between 2010 and 2023 and by more than 2% in 2024. Fossil fuels still account for 80% of primary energy consumption, and global investment in fossil fuels remained higher than in renewables.[2]

Thus, the fundamental question arises: can a transition to a non-fossil society be achieved at all? Debates on socio-ecological transformation offer numerous proposals – Green New Deals, and green-economy models. A non-fossil accumulation regime would need to

[1] Zeller 2023.
[2] IEA 2025b, 2025c.

replace the fossil energy base entirely within two decades – an essential requirement for limiting global warming. We understand an accumulation regime, following a critical regulation-theory perspective, as a configuration of capitalism capable of reproducing and adapting itself for several decades despite recurring crises, and thus exhibiting relative stability.[3]

We argue that such a non-fossil accumulation regime is impossible. Capitalist accumulation remains structurally dependent on fossil fuels. Consequently, a socio-ecological transformation of capitalism is unattainable, and reform-oriented strategies are unrealistic.

Section 2 examines the enduring power of finance capital in the context of crossing planetary boundaries in the Anthropocene. Section 3 explains why capitalism depends on fossil fuels and why rapid phaseout is impossible under capitalist conditions. Section 4 analyses the economic contradictions of a transformation toward non-fossil capitalism. Section 5 outlines the socio-economic and political implications of the impossibility of non-fossil capitalism.

2. *Continued dominance of finance capital in the context of planetary boundaries*

Understanding the interaction between Earth's planetary boundaries and the contradictions of contemporary capitalism is essential for assessing prospects for socio-ecological transformation. The current phase capitalism is characterised by finance-driven accumulation and an energy system still anchored in fossil fuels.

Since the 2007-09 crisis, capitalist accumulation has stagnated. Productivity gains in core economies remain well below those of the post-war boom or the 1990s. Since the neoliberal turn of the late 1970s, finance capital has expanded dramatically, with expectations of fictitious-capital claims – interest, rent, and other financial returns – shaping accumulation.[4] As ordinary exploitation yields insufficient surplus value, capital intensifies accumulation by dispossession[5], including extractive pressures on nature.[6] The partial profit-rate recovery of the

[3] Becker 2001; Boyer 2004; Chesnais 2004.
[4] Chesnais 2016.
[5] Harvey 2003; Zeller 2004.
[6] Foster, Clark 2020.

1990s-2000s did not sufficiently revive productive investment; instead, surplus value flowed into financial returns[7], reinforcing a rentier regime.[8] Investment has become partly decoupled from profitability.[9] During the 2007-09 financial crisis and the Covid-19 crisis, dominant policies shielded fictitious capital from devaluation, while austerity shifted costs onto workers. Climate policy based on market instruments, notably emissions trading, expanded financial claim-making.[10]

The EU's Green Deal, the U.S. Inflation Reduction Act, and other state interventions have sparked debate over whether financial hegemony is weakening[11] or whether a new mode of regulation.[12] Yet there is no evidence of a structural shift away from finance-dominated accumulation. Pandemic-related support and rearmament have increased government debt while inflating financial assets. Finance capital continues to dominate[13], reinforced by pension-fund capitalism[14] and strong links to the fossil industry.[15] Investment caution in energy and raw-materials sectors contributed to rising prices, which were intensified by the Russian war against Ukraine. In 2021, fossil-fuel companies resumed major investment in oil and gas, reversing earlier restraint, while governments watered down energy transition goals.[16]

Capital now faces the "wicked trinity" of stagnation, surplus populations, and environmental breakdown.[17] Without higher profits and new markets, investment will not reach the level needed to start a new growth phase.[18] Yet renewed growth would accelerate energy and resource use, obstructing rapid defossilisation.

Chesnais's framework of capitalism's inner and outer limits underscores how a system driven by surplus-value extraction and dominated by fictitious and fossil capital pushes Earth beyond planetary boundaries undermining the physical reproduction of human soci-

7 Husson 2008.
8 Zeller 2011.
9 Durand, Gueuder 2018.
10 Zeller 2010.
11 Durand 2022.
12 Wissen, Brand 2022.
13 Chesnais 2019; Sablowski 2024.
14 Braun 2022.
15 Hanieh 2021; RAN 2024.
16 Zeller 2023.
17 Alami, et al. 2024.
18 Husson 2021.

eties.[19] Seven of nine boundaries – global warming, biodiversity loss, land-use change, biogeochemical cycles, novel entities, freshwater use, and ocean acidification – are breached.[20]

Capitalist industrialisation and all past accumulation regimes relied on fossil energy. The fossil energy-based Fordist mode of development – with mass extraction, production, consumption, and dissipation[21] – accelerated the shift from the Holocene to the Anthropocene[22], deepening the planetary metabolic rift.[23] Earth-system processes are nonlinear; additional warming risks triggering tipping points that push the planet toward a self-reinforcing "hot house Earth" pathway[24], threatening hundreds of millions or billions of people within decades.[25]

Constructing renewable-energy infrastructure would itself emit around 195 Gt CO_2[26], while the remaining 1.5°C carbon budget corresponding to a 50 % chance of limiting warming to 1.5°C has melted to 130 Gt CO_2.[27] Global warming will therefore soon exceed 1.5°C, and the likelihood of crossing tipping points is rapidly increasing.

Global capitalist accumulation continually raises energy use, CO_2 emissions, and material throughput. The material footprint of OECD consumption has grown since 2000, often faster than GDP.[28] Although some early-industrialised countries achieved relative or temporary absolute decoupling, there is no evidence that global, rapid absolute decoupling compatible with 1.5-2°C budgets is possible under continued growth. Ecologically sustainable growth would require absolute reductions in resource use despite rising GDP – an unlikely outcome.[29] Rebound effects further undermine efficiency gains.[30] Thus, converging ecological and social crises reflect the contradiction between planetary boundaries and capital's drive for endless accumulation.[31]

[19] Chesnais 2016, 2019.
[20] Kitzmann, et al. 2025.
[21] Pineault 2025.
[22] Steffen, et al. 2018.
[23] Foster, et al. 2010.
[24] Steffen, et al. 2018.
[25] Xu, et al. 2020; Lenton, et al. 2023.
[26] Slameršak, et al. 2022.
[27] UNEP 2025: 39.
[28] Hickel, Kallis 2020.
[29] Hickel, Kallis 2020; Vogel, Hickel 2023.
[30] Santarius 2015.
[31] Chesnais, Serfati 2004; Harvey 2014.

The hypothesis of a non-fossil accumulation regime capable of stopping global heating assumes that full employment, green growth, and greenhouse gas neutrality are achievable under capitalist conditions by mid-century. This would require strong aggregate demand, satisfactory profitability, and sustained investment over decades.[32] In the next two sections, we will analyse the extent to which renewable energies limit the accumulation of capital and which central internal contradictions of capital make a non-fossil accumulation regime impossible.

3. *Energy limits to capital accumulation*

A transition to a predominantly or fully renewable energy system represents not merely a technological substitution of energy carriers, but a transformation of the energetic foundations of the entire society. Fossil fuels are *energy stocks*: concentrated, storable, high-density stocks of energy that can be owned, traded, and mobilized at will and they are huge economic assets. Renewable energy sources, by contrast, are *energy flows*: diffuse, variable, location-bound forms of energy that must be harvested in real time through large, fixed capital outlays. This shift disrupts the energy foundations that supported the Fordist and the subsequent finance-dominated accumulation regimes. It challenges fundamental dynamics of capitalist growth rooted in surplus energy, spatial mobility, and private control of productive assets. This section outlines the key structural contradictions between the physical characteristics of renewable energy flows and the core logics of capitalist accumulation.

a. Power density, spatial extensiveness, and the end of concentrated energy assets

Capitalist industrialization rested on exceptionally high power density fuels.[33] Fossil fuels enabled unprecedented spatial flexibility of production, long global supply chains, and industrial agglomeration independent of local resource endowments. Renewable energy flows reverse this logic: they possess orders of magnitude lower power density and require vast land or offshore areas, binding production again

[32] Cfr. Christophers 2022.
[33] Smil 2017.

to spatial constraints and local biophysical limits. This re-territorialization of energy supply constrains core capitalist imperatives – mobility, spatial arbitrage, and global optimization of production. The shift from compact energy assets to diffuse energy flows reduces the firm's capabilities of controlling one of their central production inputs.

b. EROI decline and the rising metabolic cost of energy

Renewable energy infrastructures generally exhibit lower *Energy Return on Investment* (EROI) than the best historical fossil fuels. Even though solar and wind EROIs have improved, the overall energy system that integrates them – featuring storage, redundancy, grid reinforcement, and materials requirements – has a significantly lower net energy surplus.[34] Modern capitalist economies emerged during a period of extremely high surplus energy from fossil assets; this surplus enabled rapid productivity growth, urbanization, and expansion of complex global supply chains.[35]

A renewable energy system's tighter net-energy margin reduces the energy available for discretionary economic activity. This challenges a growth-driven economy whose stability depends on energy surpluses large enough to sustain continual capital accumulation and expansion. Lower EROI is therefore not simply a technical parameter; it is a physical limitation that presses against capitalist growth dynamics.

c. Temporal variability is incompatible with continuous and just-in-time production

Renewable energy flows are intermittent and temporally uneven. Capitalist production, however, relies on continuous, predictable, high-availability energy to maintain capital utilization rates, minimize downtime, and preserve just-in-time logistics. Capital valorises only when production is in motion; interruptions destroy value. Machinery that stands still becomes a devalorising asset. To reconcile renewable variability with these requirements, massive overcapacity, long-duration storage, or fossil/nuclear backup systems become necessary. All three options impose high fixed-capital outlays and generate natural-monopoly infrastructures that are difficult to valorise through competitive markets, thereby depressing overall the rate of profit.

[34] Dumas, et al. 2022; Capellán-Pérez, et al. 2019.
[35] Hall, et al. 2014; Murphy, et al. 2022.

The result is a structural mismatch: capitalist production expects controllable energy stocks, while renewable systems deliver fluctuating energy flows that require system-level coordination and priority-setting. Variability thus undermines the autonomy and flexibility that firms depend on.

d. Declining energy intensity reductions and necessity of absolute demand reduction

Human history is, fundamentally, a history of *increasing and intensifying* energy use. New energy sources – wood, peat, coal, oil, gas – have never replaced predecessors; they have supplemented them and expanded the total energy throughput of society. Energy-system researchers widely agree that industrialized economies cannot achieve full defossilisation at current levels of final energy demand. Such reductions, however, directly conflict with the capitalist imperative of continual output growth and rising material throughput. Historical improvements in energy intensity are insufficient to offset total consumption, and the pace of intensity decline is slowing in many sectors.[36] In this context, the prospect of absolute decoupling – sustained economic growth combined with falling total energy use – remains empirically unsubstantiated on a global scale and in the long term. Thus, absolute reduction of energy consumption and continuous accumulation of capital are incompatible.

e. Systemic coordination needs and drift toward planning

A high-renewables system requires extensive coordination across generation, grids, storage, and demand management. Market mechanisms alone struggle to deliver such integration (e.g. see the discussion about capacity markets). As renewables scale, system stability increasingly depends on public planning, regulated investment signals, long-term infrastructure strategies, and collective decision-making over land use and energy priorities. While this contradiction is politically mediated and not structurally fatal, it displaces market techniques and weakens the 'free will' of capital.

[36] IEA 2025a.

4. *Internal limits to non-fossil capital accumulation*

The dynamism of capitalism depends on the extent to which it succeeds in minimising internal contradictions and repeatedly extending and shifting the internal limits of capital accumulation.

a. Profit rates and productivity

For an accumulation regime to remain relatively stable, demand must exist for what is produced, and profit expectations must be high enough for capital to invest at levels that secure expanded reproduction. Prices in renewables fall and help to reduce circulating-capital costs. However, decisive is that profit rates in renewable energy remain lower than in the fossil-fuel sector. Too much capital therefore remains in fossil systems.

To maintain profit rates under rising energy prices and CO_2 costs, capital would need to increase labour productivity without raising energy inputs. Rationalisation must not replace labour with machines that consume more energy. Yet empirical evidence shows that rising labour productivity is often accompanied by higher energy intensity and energy use.[37] Efficiency gains are also regularly offset by rebound effects, and there is no indication of absolute global decoupling of energy use or material throughput from economic growth.[38] Energy and material consumption must fall to reduce GHG emissions, while economic growth remains necessary for accumulation. This contradiction is irresolvable.

The last decades have also been marked by persistent slowdowns in labour-productivity growth rates. Information and communication technologies did not reverse this tendency. Under these conditions, profitability can only be maintained by increasing the rate of surplus value, that is by intensifying labour exploitation.[39] A partial, highly unlikely way out would require above-average productivity growth in non-fossil sectors combined with sharply reduced raw-material costs, raising profit margins without increasing renewable-energy prices. This would support wage growth and domestic demand. Yet building non-fossil infrastructure and CCS systems reduces labour productiv-

[37] Semieniuk 2018.
[38] Hickel, Kallis 2020.
[39] Husson 2009.

ity and energy efficiency. Moreover, climate impacts – especially in agriculture – will further depress productivity. These dynamics push profit rates down in many sectors, though not in fossil fuels. Moreover, large-scale rationalisation and the spread of artificial intelligence further undermine full employment and increase energy demand, since automated systems require constant electricity.

Fossil fuels can be owned, monopolised, and financialised as assets. The fossil industry and energy sectors exhibit high capital centralisation and oligopolistic or monopolistic structures, enabling rent revenues and monopoly surplus profits. Several major industrial players are also heavily invested in carbon-removal technologies.[40]

Renewable energy flows cannot be monopolised in the same way. Their intermittency limits sustained rent extraction, and profit is concentrated in installation rather than continuous extraction. This weakens asset-based accumulation, a central feature of contemporary financialised capitalism. However, wind turbine manufacturing has rapidly concentrated, with major engineering groups and turbine producers becoming dominant.[41] To what extent 'green' sectors can generate monopoly surplus profits and capital intensity in labour-intensive green sectors is lower than in fossil sectors, and therefore in both cases permitting higher profit rates, requires detailed investigation.

b. International division of labour

The hierarchical international division of labour further undermines prospects for a stable, sustainable capitalist configuration. Firms from metropolitan countries have countered profitability pressures by massively expanding direct and portfolio investments, decomposing value chains, and enforcing hierarchical supplier relations. This allowed them to exploit the global labour pool and exert downward pressure on wages.[42]

Avoiding capital flight into such investments would require profit rates from domestic green facilities to exceed those from global direct and portfolio investment – an unlikely scenario. Moreover, profitability in renewables depends on driving down raw-material prices, which

[40] Hanieh 2021: 257, 278ff; 2024: 257, 278ff.
[41] Christophers 2024.
[42] Durand, Gueuder 2018.

in turn relies on sustaining hierarchical, imperialist supply structures. This intensifies imperialist rivalry and contradicts any perspective of global solidarity or equitable socio-ecological transition.

c. Power of finance capital and devaluation

Within the enduring finance-dominated accumulation regime, finance capital remains deeply embedded in the fossil economy. 7,500 institutional investors – pension funds, insurers, asset managers, hedge funds, sovereign wealth funds, endowments, and bank-affiliated asset managers – held $5.1 trillion in fossil-fuel bonds and shares in May 2024.[43] Given substantially higher profit margins in fossil fuels than in renewables[44], financial institutions have little incentive to divest. In recent years, most cash flow went to dividends, share buybacks, and debt repayment, while clean-energy investments received only a tiny – and shrinking – share.[45]

Between 2021 and 2024, the largest 65 banks allocated only $1.37 trillion to sustainable power (solar, wind, and related infrastructure) compared to $3.29 trillion to fossil fuels. Financial flows to renewables followed the same fluctuations as fossil financing. Aligning with a net-zero trajectory requires a 60% cut in fossil-fuel financing by 2030, an immediate end to financing expansion, and doubling investments in clean alternatives. Yet banks continue to favour fossil fuels due to higher returns.[46] The Net-Zero Banking Alliance has collapsed.[47] Green finance will remain marginal without a redesign of macro-financial regimes, expanded planning, and the decoupling of pension systems from short-term financial returns.[48] The central challenge is the massive devaluation of fossil capital required for any fossil phaseout. Dismantling fossil infrastructures and downstream industries demands a political balance of power capable of enforcing this devaluation and ensuring that the costs fall on capital owners.[49]

[43] Urgewald 2024.
[44] Christophers 2024.
[45] IEA 2023:61f; 2025b: 54, 63.
[46] Reclaim Finance 2025: 6.
[47] Mundy 2025.
[48] Gabor, Braun 2025.
[49] Hansen 2022; Semieniuk, et al. 2022.

5. *Conclusion*

Both, the internal contradictions of the capitalist mode of production as well as its incompatibility with planetary boundaries and the biophysical limits of a renewable-based economy render a non-fossil accumulation regime impossible.

Renewable energies themselves possess capital-unfriendly properties. *First*, they are spatially extensive, less energy-dense, intermittent, and yield lower net energy surplus. They also resist monopolization, undermining asset-based accumulation. *Second*, there is no evidence that continued capital accumulation can reduce global resource and energy use in absolute terms at the necessary pace. *Third*, renewables presuppose coordinated planning, impose limits on growth, and challenge ownership structures tied to energy stocks rather than flows.

Three economic contradictions are central. *First*, productivity gains achievable with renewable energies are insufficient to simultaneously raise wages, expand social infrastructure, and restore profit rates. *Second*, it is unrealistic that green and non-fossil sectors could generate higher profits than fossil sectors, given their structural characteristics and current patterns of accumulation. *Third*, global competition and imperialist rivalry undermine the cooperative planning required for industrial conversion and an accelerated energy transition.

Capitalist accumulation thus proves not only ecologically unsustainable but also energetically incompatible with a non-fossil socio-metabolic regime. The conflicts between renewable energy flows and capital accumulation are not merely political or ideological but rooted in the biophysical properties of energy sources and the systemic logic of capitalism.

This discourse on the green-modernist hegemony project has contributed to two strategic errors within major currents of the climate movement and the political left. *First*, it underestimated capitalism's structural dependence on fossil fuels and thus the entrenched power of fossil capital. *Second*, it assumed the hegemony of a green modernization project and positioned itself as a progressive corrective to a transformation process lacking any material basis. A non-fossil accumulation regime would require the disempowerment of finance capital. The task is therefore to develop strategies capable of mobilizing broad sections of the working population and building the social power necessary for disempowering capital and an ecosocialist transformation.

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Second Section

Social Movements

The Silent Wave of Climate Migrations: An Intersectional Analysis of Gender, Health, and Climate Migration in South Asia

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Abstract

In this paper, I argue that climate change acts not merely as an environmental disruptor but as a profound multiplier of pre-existing social inequalities, with gendered health implications constituting a critical yet under-examined dimension of climate-induced migration. Drawing on a mixed-methods approach that integrates theoretical analysis with qualitative fieldwork, I focus on India, Pakistan, and Bangladesh – nations emblematic of the "Most Affected People and Areas" (MAPA) paradigm. My research demonstrates that the failure of international legal frameworks to recognize "climate migrants" renders invisible a crisis of escalating magnitude, while a lack of intersectional analysis obscures the specific vulnerabilities of women and marginalized groups throughout the migration process.

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Keywords: Climate Migration, Gender, Health, Intersectionality, MAPA, South Asia, Environmental Justice

1. *Introduction*

My research into climate migration begins from a critical premise: while climate change is often treated as a monolithic scientific event, its human consequences are deeply fragmented and unequal.

The central question guiding my research is not only if people move due to climatic pressures, but how the intertwined factors of gender and health mediate their decision to migrate, their experiences during displacement, and their outcomes in destination areas. I posit that the climate crisis exacerbates and reproduces systemic gender discriminations and health disparities, creating a silent wave of suffering that remains largely unacknowledged in policy and public discourse.

The populations of India, Pakistan, and Bangladesh, despite their minimal historical contribution to global greenhouse gas emissions[1], face some of the most severe impacts. Through this paper, I aim to amplify their experiences and challenge the legal and conceptual frameworks that continue to obscure this growing humanitarian crisis.

2. *Theoretical Framework: Deconstructing the Climate Migrant*

A significant part of my analysis involves navigating the complex and contested terminology surrounding climate-linked mobility. The term "climate refugee", while powerful in advocacy, lacks legal foundation under the 1951 Geneva Convention. I therefore adopt the operational definition provided by the International Organization for Migration[2], which describes environmental migrants as persons compelled to move due to sudden or gradual environmental changes. This definition usefully encompasses both forced and voluntary movement, internal and cross-border displacement.

My theoretical stance aligns with scholars like Faist[3], who argue for a socio-ecological understanding of migration, rejecting the exceptionalism of humans from nature. Climate change does not operate in a vacuum; it interacts with and intensifies existing social, economic, and political vulnerabilities. This is encapsulated in the activist-born acronym MAPA (Most Affected People and Areas), which I employ to center the experiences of those in the Global South and marginalized communities everywhere, who bear the brunt of climate impacts[4].

[1] Kumari et al. 2018.
[2] IOM 2007.
[3] Faist 2020.
[4] Fridays for Future 2020.

3. *The South Asian Context: A Nexus of Vulnerability*

The geographies of India, Pakistan, and Bangladesh represent a perfect storm of climatic risk and socio-economic precarity. Data from the Internal Displacement Monitoring Centre (IDMC) consistently ranks these nations among the highest for disaster-induced internal displacement. The World Bank (2018) projects that without urgent action, up to 143 million people in Sub-Saharan Africa, Latin America, and South Asia could be forced to move internally by 2050.

My research identifies two primary, overlapping drivers in this region:

Rapid-Onset Disasters: Catastrophic events like the 2022 Pakistan floods, which submerged a third of the country, displaced 8 million people, and caused an estimated $30 billion in damages[5].

Slow-Onset Processes: Gradual yet irreversible changes such as sea-level rise in Bangladesh[6], desertification in India, and glacial melt affecting freshwater resources for millions.

4. *Gendered Health Vulnerabilities*

Women and girls face disproportionate health risks due to biological factors, culturally prescribed roles, and socioeconomic disparities. In South Asia, women are often responsible for water and fuel collection. During droughts, this role becomes more arduous and time-consuming, with the WHO estimating that in water-scarce parts of India[7], women can expend over 30% of their daily energy fetching water. This exposes to greater risks of musculoskeletal injury and waterborne diseases when safe sources are compromised[8]. Furthermore, indoor air pollution from traditional cookstoves, a task predominantly performed by women, contributes significantly to respiratory and cardiovascular diseases[9]. Nutritional disparities, where women and girls often eat last and least, compound these vulnerabilities, leading to higher rates of anemia and complicating pregnancy outcomes[10].

[5] Government of Pakistan et al. 2022.
[6] IOM 2010.
[7] WHO 2014.
[8] Daud et al. 2017.
[9] Health Effects Institute 2018.
[10] Sorensen et al. 2018.

5. *Climate Change and Gender-Based Violence (GBV)*

One of the most alarming findings of my research is the robust correlation between rising temperatures and gender-based violence. A seminal study published in JAMA Psychiatry[11], which I built upon, analyzed data from nearly 200,000 women in India, Pakistan, and Nepal. It found that a 1°C increase in annual temperature was associated with a 6.3% rise in intimate partner physical and sexual violence. In India, this increase was even more pronounced at 8%. The study projects that by the end of the century, India could see a 23.5% increase in domestic violence prevalence due to temperature rise alone. This phenomenon can be attributed to a "stress pathway": crop failure, economic hardship, and loss of livelihood induced by climate disasters create conditions of extreme psychological stress, which can manifest in increased violence within households[12]. My own qualitative findings from the field corroborate this, with interviewees describing a palpable increase in domestic tension following climatic shocks like droughts or floods.

6. *Research Design and Preliminary Findings*

My methodological approach combines a thorough review of scientific and policy literature with qualitative, semi-structured interviews with individuals from the three focus countries who have experienced climate-related mobility. This dual approach allows me to bridge the macro-level data with the micro-level, lived experiences. For many, the environment is the "threat multiplier", exacerbating poverty, food insecurity, and social instability until migration becomes the only viable option. The interviews also highlight the "trapped population" phenomenon, where the most vulnerable-often women, the elderly, and the impoverished-lack the resources to migrate, remaining in high-risk areas.

[11] Zhu et al. 2023.
[12] Care International 2020.

7. *Conclusion and Policy Implications*

In conclusion, my research underscores that climate migration is a tangible, present, and growing reality, fundamentally shaped by axes of gender and health. To address this challenge, a paradigm shift is urgently required. First, the international community must develop legal instruments to recognize and protect the rights of climate migrants, moving beyond the outdated 1951 Refugee Convention framework. Second, climate policy and adaptation funding must be explicitly intersectional. This means integrating gender-based analysis into all disaster risk reduction, health system strengthening, and migration management plans. Empowering women through land rights, education, and economic opportunities is not just a social good; it is a critical climate resilience strategy. Finally, we must reframe mobility not solely as a crisis to be managed, but, as suggested by scholars like Bettini and Vince[13], as a potential form of adaptation. Facilitating safe, orderly, and regular migration can be a legitimate strategy for survival in a warming world. The silent wave of climate migration is already here. By listening to the voices of those at the forefront – the MAPA communities of South Asia and beyond – we can begin to build a response that is not effective but also just.

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[13] See Bettini 2014, and Vince 2023.

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Mediating Desire: The Ecosocialist Subject and the Vanguard Party

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Abstract

This paper contributes to ecosocialist theory by critiquing the treatment of political subjectivity and desire in the debate between degrowth ecosocialism and left ecomodernism. We argue that despite their apparent opposition, both camps share a fundamental flaw: they accept the capitalist desiring subject as an immediate, pre-political given. Ascetic degrowth seeks to limit this desire, while productivist ecomodernism seeks to indulge it, but neither proposes a qualitative transformation of desire itself, which remains formatted by the real subsumption of production under capital. Analysing these positions through a theoretical lens, we propose that overcoming this impasse requires mediation to produce a collective revolutionary subject. The paper concludes that the vanguard party is the necessary mediating entity to cohere class consciousness, direct desire beyond capital's horizon, and achieve an anti-imperialist ecosocialist transition.

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1. *Introduction*

Debates over the correct approach to ecosocialist transition are by now well-trodden.[1] Two positions often presented as opposing poles are degrowth ecosocialism and left ecomodernism. These are both broad, heterogenous traditions; however, the former is largely united in its critique of infinite growth on a finite planet, and the latter normally takes a positive view of growth, supporting large-scale industrialisation, productivism, and technologization.[2] Many degrowth proponents[3] instead argue that material abundance can be achieved while *decreasing* material throughput by reorganising production towards social, ecological, and anti-imperialist ends. The respective merits and pitfalls of these positions have been dealt with elsewhere[4]. Indeed, Holgersen suggests that the dichotomies raised in the debate (e.g., for or against growth) are themselves obstructive.[5]

This is a useful point of departure. The debates have consistently made claims as to the nature of the political subject of ecosocialism. Ecomodernists often present themselves as representatives of the working class and portray degrowth as a politics for the "professional-managerial class".[6] This is a mistaken claim[7]. Regardless, treatments of political subjectivity in these debates do not go far enough. We contend that proponents of each camp make explicit claims about subjectivity that must be interrogated further, particularly as they relate to the issue of desire and how desire itself relates to the prevailing system of production. Further, that these claims, while apparently in opposition, actually share the same problematic root. This paper is therefore a contribution to the ecosocialism debate through the lens of desire and political subjectivity.

To reiterate, these positions are inherently multifaceted. As such, we refer to each position –degrowth ecosocialism and left ecomodernism – to refer to certain specific tendencies within each camp. For the

[1] Ajl 2019; Barca 2016; Heron 2024; Holgersen 2023; Huber 2022; Huber 2019a.
[2] Holgersen 2023.
[3] e.g., Hickel 2020.
[4] Heron 2024; Holgersen 2023.
[5] Heron 2024.
[6] Huber 2019b.
[7] See Barca 2016.

former, we refer to more ascetic articulations of degrowth that correspond more closely to familiar critiques of the position as a whole (see Section 3). For the latter, we include conventional left ecomodernism[8] as well as vulgarised forms of left accelerationism.[9] Ultimately, we propose that ecosocialism requires the qualitatively transformed desiring subject, achieved through the mediating entity of the revolutionary vanguard party.

2. *Defining desire*

The literature on desire is vast – there is no space here to deal with it comprehensively. Treatments of desire include its position as inherently social and as the motive force of human action;[10] as something to be repressed to avoid civilisational collapse in the face of material scarcity;[11] as a productive and connective "flow";[12] and as an "historical-machinic force" that cannot be indefinitely suppressed.[13]

We opt for a materialist conception of desire, similar but not identical to Lordon's articulation of desire as "the facticity of our relations and history".[14] Essentially, desire cannot be defined abstractly and remain practical because desire is historically contingent and is interwoven with prevailing material conditions. It is likewise formatted by the dominant ideology that stems from those conditions.[15] Under capitalism, this involves bending desire towards the demands of capital accumulation, the *raison d'être* of capitalism.

However, as desire can never be fully satisfied under the oppressive conditions generated by capitalism, desire can never be *indefinitely* subsumed to the demands of capital, even if it becomes *really* subsumed (see below). The desire of oppressed subjects is always inevitably pushing against the barriers of capitalism, searching for a fulfilment unavailable within the present system – what Fisher terms "post-capitalist desire".[16]

[8] e.g., Huber 2022.
[9] e.g., Bastani 2018.
[10] Read 2024; Spinoza 2004.
[11] Freud 1989; cf. Marcuse 1974.
[12] Deleuze & Guattari 2009.
[13] Fisher 2012.
[14] Lordon 2014.
[15] See Marx 2022.
[16] Fisher 2021.

Here, we find the Deleuzo-Guattarian, Spinozist, and Fisherian conceptions of desire as a propelling force, as something always seeking new connections, and as something ultimately illimitable, useful as they relate to how desire is concretely produced under capitalism.[17] That is, a system which constantly produces desire to fuel capital accumulation, but in so doing inevitably generates aberrant desires that push at the limits of the system, and which, through a mediating political body, have the best chance of resisting recuperation and breaching the boundaries completely.

To reiterate, these contradictions indicate a subject that is not the possessor of a static desire but a desire entwined with material and historical conditions, which has implications for the ecosocialist treatment of desire and subjectivity.

3. *Degrowth ecosocialism and desire*

Certain strands of degrowth ecosocialism appear to fear desire, seeing it as something dangerous, as something to be limited. Consider the following statements: "We will need to set rules for regulating and restricting the unleashed greed of agents";[18] "we have to relearn the wisdom of past ages: enjoy slowness and appreciate our own territory";[19] and "…we will also have to limit…the limitless accumulation of money and power… What we have left… is the wisdom of simple living".[20] Lastly, Bosworth notes that Saito likewise makes "an argument for 'self-limitation as a form of good freedom'", making him "open to an easy critique from those who would posit degrowth communism as austerity".[21] (In fairness, while it may leave Saito *open* to such a critique, that critique would not be entirely accurate).

What these positions have in common is that they each emphasise *quantitative* limitations of what essentially remains a desire produced within capitalism. Desire, taken as is, must be moderated through an ascetic, retrograde re-articulation of past ways of living, including even ancient Greek philosophy (e.g., Epicureanism).[22] Moreover,

[17] Deleuze & Guattari 2009; Fisher 2012; Read 2024.
[18] Latouche 2015.
[19] Latouche 2009.
[20] Kallis 2019.
[21] Bosworth 2024; Saito 2024.
[22] Köstem 2021.

Ajl notes that coursing through this line of degrowth thought from Latouche to Kallis, among others, is belief in a "radical reduction of work", that work in a post-capitalist society is something to be avoided in favour of more time for leisure and play.[23]

4. *The mirror image: ecomodernism*

Ascetic versions of degrowth fall prey to immediacy in their treatment of desire and the desiring subject – meaning they take what is immediately given as fixed, objective reality. Ecomodernism and its vulgarised left accelerationist extensions (e.g., FALC) fall into the same trap but from the other side: desire is not to be limited but rather unleashed, the subject not disciplined but wholly indulged. Rather than the "wisdom of simple living"[24], which ecomodernists dismiss as a "politics of less",[25] we need more production (which of course means more consumption and resource extraction).[26]

Only in this way can workers be won over, ostensibly breaking free from the limits of capitalist production – what Heron critically terms "the great unfettering"[27] – to achieve a fully or highly automated society where workers will be free from the oppression of labour to live a life of leisure and luxury.[28] A crude rearticulation of Marcuse's technological rationality in *Eros and Civilisation*.[29]

Again, desire production under capitalist social and material relations mirrors capital in its "purposiveness without purpose"[30] – necessarily unlimited in order to support the endless drive required for continued capital accumulation. The problem for degrowth ascetics and ecomodernists is that they try to either suppress capitalist desire or surpass it, without negating the real subsumption of production that formats desire and the desiring subject in this way.

Through the suppression of desire, ascetics seem to seek that impossible "return to pre-capitalist territorialities" which would be impossible without "a massive reversal of history, or collective amnesia

[23] Ajl 2018.
[24] Kallis 2019.
[25] Brooks 2023.
[26] Heron 2024.
[27] Heron 2022.
[28] Bastani 2018.
[29] Andrew 1970; Marcuse 1974.
[30] Fisher 2021.

on a grand scale, or both".[31] The ecomodernists merely differ from the ascetics "in the machinic intensity" of the post-capitalist society they envision – the question of a truly qualitative transformation of production is not raised.[32] As production remains qualitatively more or less the same, so do desire production and the subject, and the imagined future society would inevitably reproduce the same oppressive dynamics we struggle against today.

Ross provides the example of Napoleon Gaillard, a shoemaker in the Paris Commune.[33] As the Commune briefly ushers in qualitatively different social and material relations, there is an explosion of liberated desire, and Gaillard unleashes his desire to make the perfect shoe.[34] He transforms shoemaking into an art form; he rejects defining his craft in terms of profitability, even turning away rich clients who did not align with his vision.[35] Essentially, Gaillard rejected subsuming his desire to the demands of capital accumulation. Yet, at the same time, his desire is clearly illimitable (as opposed to unlimited) – it is productive and connective; he is constantly experimenting with his craft, designing, producing, refining. Work as "an activity of freedom, dignity and fulfilment".[36]

Why, then, should Gaillard opt for the simple life and work less? Or why should he be separated from his desire, shoemaking automated so he can live a life of leisure? In both cases, he apparently becomes free from oppressive toil – though it is doubtful he would see it that way! Beyond limitation or automation, Gaillard represents a qualitatively different vision of production that embraces the liberatory potential of unalienated labour.[37]

As new social forms were being collectively articulated in the Commune, desire briefly broke free from the dictates of capital accumulation, demonstrating that desire can be fundamentally transformed. Yet the conditions created by the Commune proved ephemeral, the workers isolated and defeated.[38] At this historical stage, the worker movement was underdeveloped – it had not yet become conscious of its objective

[31] Fisher 2012, p. 135; Id. 2009, p. 79.
[32] Ajl 2018.
[33] Ross 2016.
[34] *Ibidem*.
[35] *Ibidem*.
[36] Andrew 1970, p. 245; see Marx 1988.
[37] Marx 1988.
[38] Marx 2001.

position and historic role as a class, which requires the cohering force of a conscious vanguard to help organise and elevate the consciousness of the workers.[39] Without these developments, the worker movement had not yet become conscious of, and "[made] itself capable of overcoming all resistance" to the realisation of, its ultimate goal, socialism.[40]

5. *The real subsumption of desire*

Marx distinguished between the formal subsumption and real subsumption of production under capital. Formal subsumption indicates "the takeover by capital of a mode of labour developed before the emergence of capitalist relations".[41] Real subsumption means that a "complete (and constantly repeated)" transformation "takes place in the mode of production, in the productivity of the workers and in the relations between workers and capitalists" towards the singular goal of capital accumulation[42].

Real subsumption works through reification. Marx provides an example in *Capital*:[43] In the manufactories, the rhythm of production is the worker's rhythm, and the machine or the tool is an extension of the worker. In the factories, the machine sets the rhythm, and the worker must follow it – the worker becomes an extension of the machine. In other words, the worker becomes the object, and the thing (tool, machine) becomes the subject, which is the definition of reification (inversion of object and subject).

Deleuze and Guattari bring a similar understanding to desire production with the concept of axiomatisation.[44] Capitalism frees desire relative to earlier social forms only to imprison it under the axiom of capital accumulation. For example, while historically artists painted what their patrons (usually nobility or religious institutions) demanded, under capitalism a painter is free to paint whatever they want – as long as it makes money; otherwise, they are no longer a "professional". If it cannot be commodified, they are still free to pursue art as a pauper or hobbyist (i.e., a "failure").

[39] Lih 2005.
[40] *Ivi*, p. 102.
[41] Marx 2004, p. 1021.
[42] *Ivi*, p. 1035.
[43] *Ibidem*.
[44] Deleuze & Guattari 2009.

Deleuze and Guattari's approach is useful but incomplete. First, separating direct and indirect coercion so neatly is problematic. But beyond that, what is missing is an understanding of the *real* subsumption of desire; what Deleuze and Guattari describe is merely *formal* subsumption. Capitalism institutionally subsumes desire on a more fundamental level. Extending the example above, this means organising the entire art world – from conservatories to galleries and museums – in such a way that the *only* way to exist as an artist is to accumulate capital; the "product" must be "marketable". ("[L]abour capacity only continues to be labour capacity in so far as it is sold to capital".[45] And through this imperative, starting with education, it creates artists that can create the desired (saleable) products. The commodity becomes the subject, and the artist becomes the object.

What is key here is not just the system of production, but also that the desire of the producer is really subsumed through processes of direct and indirect coercion, manifesting, for example, in the selection of the most "useful" producers by the institutions of the industry. The art example is convenient because the connection between production and desire is more readily apparent. But one could equally point to real-world examples in industry, such as the Lucas Aerospace or the ex-GKN factory workers,[46] who faced/face a conflict between their desires to engage in socially useful production and the limits posed by the real subsumption of their industries to capital accumulation – expressed as intense resistance by the capitalist class and its agents (direct coercion) and the pressure to nonetheless produce marketable commodities (indirect coercion).

6. *Politicising desire: immediacy and mediation*

Just as there is no general mode of production but rather historically given modes of production,[47] the same is true of desire. Ignoring this historicity leads to two positions that appear as their respective opposites but ultimately have the same root. The ascetics and sybarites of the two poles of ecosocialist thought we have outlined take the subject as is – in immediate terms. The question then becomes whether to discipline or indulge this subject, a question of principles versus pragmatism.

[45] De Sicilia 2025, p. 168.
[46] Atkins 2023; Gabbriellini et al. 2024.
[47] Marx 1999.

Neither are sufficiently political positions. Kornbluh recently argued that immediacy (defined as a preoccupation with the present, the affective, and what is perceived as immediately "real" or "authentic") has become the style of "too-late capitalism".[48] It has also become the style of the left: as Dean argues using slightly different terms, "'Bourgeois modes of subjectivity'" have "come to dominate the movement".[49] Immediacy is a defining characteristic of bourgeois subjectivity[50], an objectivity formed through the gaze of the objectifier.[51]

It is clear that desire and subjectivity must be qualitatively transformed. Immediacy is overcome through mediation, which upends the mystifying effects of reification, allowing the subject to understand that social and material relations that previously appeared natural and unchangeable are historically contingent and can be remade.[52] Mediation is a question of praxis, a collective process, which enables the creation of a collective subject capable of carrying through revolutionary change.[53] In other words, mediation can beget a qualitative change in desire and the subject—from an immediate, individual desiring subject to a mediated, collective desiring subject united by "a common relation to a common condition of division".[54]

This has concrete implications regarding imperialism, for example. Imperialism creates conditions for the transfer of cheap labour, commodities, land, and resources from the periphery to the core,[55] devastating the planet in the process.[56] It likewise enables or supports genocides such as in Palestine and Sudan. Yet, imperialism *appears* as materially beneficial to workers in the core, as what enables their way of life. In reality, material conditions in the imperial core are also declining, creating a situation where workers might *know* imperialism is morally wrong – they know the genocide in Palestine is one of the defining crimes of this era – yet there are few who are in a position to

[48] Kornbluh 2024.
[49] Dean 2020, p. 151.
[50] Fisher 2021.
[51] Haslanger 2002; MacKinnon 1987.
[52] Fisher 2023; Id. 2021.
[53] Fisher 2021; Lukács 1967.
[54] Dean 2013, p. 33.
[55] Ajl 2023; Hickel et al. 2024.
[56] Wiedmann & Lenzen 2018.

make the moral political choice of full-bodied resistance. The relation between the condition of workers in the core and periphery is superficially distorted from one of shared to one of competing interests.

But imperialism and national liberation are of paramount concern to the international worker's movement.[57] While workers in the core may be pacified somewhat with the spoils[58] – though this historical period is coming to an end – it is only capital that in the last analysis profits from imperialism[59]. Though the effects are unevenly distributed, all workers are ultimately exploited and oppressed, and their means of life – the soil, air, and water – devastated.[60]

Crucially, this is not a matter of correcting a "false consciousness" with a "true" one, nor of competing narratives. The chasm between the imperialist desire for a share of the spoils and the anti-imperialist desire for international solidarity represents two fundamentally different structures of desire. The conflict is not merely over "truth", but over what conditions we seek to create.

This analysis requires a deeper level of political understanding than what is immediately given. Operating at the moral level is evidently insufficient for building a mass worker's movement capable of victory. Moreover, the link between anti-imperialism and ecological struggle is irrefutable.[61] As such, any ecosocialist position that takes the desiring subject as is – even if it takes a strong stance on anti-imperialism and national liberation (which is not always the case) – ultimately has no chance of success.

And neither is the issue one of the left failing to develop the "correct" narratives and slogans that outflank the right at the level of affect, as left populists often argue.[62] The right can sloganise the existing dominant ideology, the capitalist immediacy. Without a mediated response, we can either say a weak and moral "no" or an indulgent, shameless "yes" to the slogans of reaction. What is required to carry through anti-imperialist ecosocialism is a qualitatively transformed, i.e., mediated, subject – a revolutionary collective subject. And the

[57] Cabral 1966.
[58] *Ibidem*.
[59] Amin 1976.
[60] Heron 2024.
[61] Ajl 2021.
[62] See Mouffe 2022.

mediating body capable of cohering and directing those constantly produced errant desires beyond the realms of capital's demands can only be the vanguard party.

7. *The vanguard party and class consciousness*

Capitalist ideology is inherently reifying; it makes contingent social relations appear fixed and immutable, obscuring the possibility of change.[63] It is also individualising, because the individual is what is immediately given[64]. But it is precisely because of the working class's position in relation to production that overcoming reification is possible.[65] As the working class comes to understand itself consciously *as a class*, which itself mandates the abolishment of the "isolated individual".[66] it simultaneously comes to perceive "the objective… nature of society" and its position in it (as an exploited commodity).[67]

Class consciousness achieved via mediation, however, is not merely about *knowing* that you are exploited; it is not a state to reach but a place to actively dwell in through praxis. Hartsock developed this in the context of feminist consciousness: it was through consciousness-raising praxis that women came to understand their experiences of oppression were not individual but shared experiences resulting from their relationship to production and reproduction under capitalism.[68] This understanding is "neither self-evident nor obvious" but achieved through organised struggle and concrete analysis.[69]

Lukács likewise stresses this is decisively a question of praxis.[70] Fisher summarises the issue quite clearly: class consciousness is not an identity based on shared traits, but a transformative praxis achieved by acting in accordance with a shared class position.[71] Crucially, for Lenin, this consciousness attains a truly political character only when "workers are trained to respond to all cases of tyranny, oppression, violence, and abuse no matter what class is affected".[72]

[63] Fisher 2021.
[64] *Ibidem*.
[65] Lukács 1967.
[66] *Ivi*, p. 198.
[67] *Ivi*, p. 174.
[68] Hartsock 2019.
[69] *Ivi*, p. 165.
[70] Lukács 1967.
[71] Fisher 2021.
[72] Ehrenberg 1983, pp. 293-294.

For both Lukács[73] and Lenin,[74] the revolutionary vanguard assumes the role of mediator. The spontaneous movement of the working class carries the embryo of consciousness, the potentiality.[75] To realise this potential and prevent the class from falling into the trap of immediacy (i.e., acting in accordance with "bourgeois ideology")[76] requires a conscious element whose role is to demystify reification. This vanguard acts as the "collective memory" of the working class, democratising knowledge rather than gatekeeping it, and helping to coordinate struggles rather than dictate them.[77] It is through this joint movement of theory and praxis that a collective revolutionary subject is developed[78] – the vanguard is merely the glue that coheres this movement.

Similarly, the issue of desire cannot be resolved individually through abandonment of one's material desires or through marginal economistic demands from one's boss. Rather, the contradiction must be collectivised across society as a whole so that it can really be solved. The advancement of a mass vanguard party can therefore develop a subject that does not desire individually but collectively. And it can develop and direct those desires towards a horizon beyond capital – a communist horizon.[79]

8. *Conclusion*

A serious limitation of our focus has been a general conception of the desiring subject; a complete account must integrate desires emerging from the most oppressed sections of the class, whose objective position generates desires that press most urgently against capital's limits. This includes feminist struggles over social reproduction that prefigure radically different social forms[80] and queer desires to transcend the heteronormative family and its repressed eroticism.[81]

[73] Lukács 1967.
[74] Shandro 1995.
[75] *Ibidem*.
[76] *Ibidem*.
[77] Chari 2024.
[78] Ehrenberg 1983.
[79] Dean 2012.
[80] Barca 2024.
[81] E.g., Mieli 2018.

Ultimately, however, without forcing a change in the mode of production, we cannot hope to fundamentally change desire production. There is a reason some of the few clear examples of free desire we have seen (though we are certain there are many more) are from the Paris Commune[82] and after the October Revolution.[83] Conversely, movements that take the desiring subject as it is immediately given cannot hope to force a change in the mode of production, which bears especially pressing implications for ecological struggle on a devastated planet.

This contradiction can be resolved through renewed efforts to build a vanguard party, which can cohere a renewed internationalist struggle for communism. It is through the development of *universal* class consciousness that an anti-imperialist, ecosocialist worker's struggle can succeed. This being via the de-reifying activity of organised collective struggle, which builds a class conscious of itself as a class, and, in so doing, transforms the subject's understanding of reality and its position in it.[84]

This qualitative transformation of the subject, its abolition as an individual and its rebirth as collective, likewise signals the movement from individual to collective desire. This desire, driven by shared revolutionary struggle via the mediating body of the vanguard, develops the potential to become a fundamentally different desire – a communist desire – fully realised only through revolutionary overthrow of the capitalist mode of production. The fulfilment of these conditions should be the goal of all revolutionary movements today.

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[82] Ross 2016.
[83] Kiaer 2005; Kollontai 2022.
[84] Fisher 2021.

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Political ecology of living labour, eco-unionism and council ecosocialism

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Abstract

This paper offers a renewed interpretation of the Marxian concept of living labour in order to contribute to contemporary ecomarxist debates and to shed light on eco-unionist strategies based on alliances between workers, environmental activists, and local residents. The first part examines the genesis of the concept in the young Hegel and then in Marx's *Grundrisse*, as well as the distinct trajectory it enables within eco-Marxism compared to the metabolic rift school. The second part analyses examples of eco-unionist inquiries and struggles undertaken by the forestry workers of the French National Forest Office and by the refinery workers at Total Grandpuits in France. On this basis, the third part critiques prevailing strategies of climate class struggle and ecological activism, and outlines the main contours of a council ecosocialism.

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Most eco-Marxist theories have focused so far on the objective necessity of an ecological and social revolution (as do the theories of metabolic rift following John Bellamy Foster's path – see Foster 2000), but the time has come to shift towards a reflection on the subjective motivations, social forces and political strategies for such a revolution. Ecological Marxism – as an anti-productivist refoundation of Marxism rather than a rediscovery of its eternal truth (Cukier

& Guillibert 2025) – should enter a new phase, in order to engage with the novelty of the current historical moment, which I refer to as "catastrophe capitalism" combining green capitalism, climate technosolutionism, environmental militarism, fossil fascism and new imperialist wars (Cukier 2025). In my perspective, the political ecology of living labour – and eco-unionism as its political strategy – is what we can rely on to oppose this course towards cataclysms.

The strategic dimension of ecomarxism is thus at the core of my book in progress, *Political Ecology of Living Labour. Catastrophes, Ecomarxism, and Revolution*. On the basis of workers' and militants' inquiries and struggles, I develop an ecomarxist reinterpretation of Marx's concept of living labour, defined as the subjective, natural and affective dimension of productive and reproductive activities – and more precisely in the *Grundrisse* as the labour process insofar as it is performed by a living, natural, and historically constituted being, linked to nature's self-production, is subjected to exploitation, and stands in opposition to the objectified labour or "dead labour" of capital and capitalist machines. The idea is to highlight, within the concrete experience of workers, the potentialities of care and ecoregulation (Benton 1996) towards living beings and ecosystems, in order to found a critical standpoint on the ecodestructive effects of capitalism on human and non-human natures. On this basis, I propose to challenge the technosolutionist ideology of green capitalism and of the Green New Deals but also to overcome the lack of attention of most ecomarxist theories to the "working-class ecology" (Barca & Leonardi 2018; see also Barca 2024). This does not imply that workers alone should lead the ecological revolution, nor that the fundamental ecosocialist idea of the subordination of work to needs should be called into question, but that the logic of living labour should prevail within the alliances between workers, environmental activists and residents (Cukier 2024). The latter must accept to enter the secret laboratory of production, and to inquire with workers about the paths of ecological redirection of work. These alliances between unionists, residents and activists constitute what I call eco-unionism, as a strategy which can orient conquests of new rights and powers for workers and residents, and ultimately point to the kind of council ecosocialism I have proposed in previous research (Cukier 2023).

In this paper, I will first focus on the Hegelo-Marxian concept of living labour as a fundamental perspective for ecomarxism, and as a path to overcome some of the theoretical difficulties and strategic blind

spots of the metabolic rift school. Then I will analyse two examples of socio-ecological struggles in France (of the forest workers of the National Forestry Office, and of refinery workers of Total Grandpuits) as examples of eco-unionist moves towards an ecosocialism from below, rooted in living labour, in contrast to the versions of ecosocialism from above, conceived from the perspective of science or the State.

1. *Living labour as a fundamental category of ecomarxism*

I claim that most ecomarxists fail to see that the normativity of the Marxian critique of the degradation of nature by capitalism lies not in scientific discourse but in the standpoint of workers which Marx frames notably as "*Lebendige Arbeit*" in *Grundrisse* (Marx 2010). If we unfold it, we find four dimensions of the concept: 1. historical naturalism (see Guillibert & Monferrand 2018): the recognition of the naturalness and affectivity of the living worker and the necessity for capitalism to reproduce the life of the labour force; 2. philosophy of nature: referring to the self-reproducing power of nature; 3. political economy, for which the natural force of use-value production is also the object of exploitation; 4. critique of political economy: elaborated from the concrete standpoint, rooted in the attachment to their internal and external natures, of worker's class antagonism to the domination of dead labour. This approach of the subjective, natural and critical side of the labour process is what I propose to reactualize in order to conceive the extractivist, productivist and ecodestructive dimension of capitalism.

It is not often said, but living labour is first a Hegelian concept. In his early *System of Ethical Life* (Hegel 1979), "*reale oder Lebendige Arbeit*" means the subsumption of the subject's activity by the object. For the young Hegel, who speaks here the language of the Schellingian philosophy of nature, living labour is defined by the fact that its objects are living and thus present themselves as natural activities, that of plants, animals and children. Hegel first stresses the relationship to the plant's natural self-production: the plant "produces itself" and in horticulture as living labour remains "in the power of the element (the earth)" as "it is left to the element to compel the plant to produce" or put differently "is only related to something living and lets it alone." (Hegel 1979, p. 108). As in Benton's concept of eco-regulation, Hegelian living labour accompanies and regulates a natural production process. Concerning

"the point of view of living labour" in farming, Hegel writes that "This labour is an association of animals for movement and strength, and the delight of this propagation is above all the aspect that is relevant here" (Hegel 1979, p. 109). Finally concerning "formative education" as living labour related to the "labour of nature" within the child, Hegel insists again on its affective dimension as the child produces in its parents "the highest individual natural feeling" (Hegel 1979, p. 112). Already in this first conception by Hegel – which constitutes of course an inferior form of labour in the *System of Ethical Life* –, we find the emphasis on the nature of the worker's body (first dimension), on the relationship to nature's self-production (second dimension) and on the ethical dimension of care for nature (fourth dimension).

Let's turn, now, to Marx's *Grundrisse*, and focus directly on the critical dimension of the concept. For Marx, living labour is the standpoint that reveals the alienation of the worker, both from his own natural capacities (his organic body) and from external (or inorganic) nature in capitalism, thus conversely highlighting the real possibility of a non-alienated labour. At the end of a sentence that sums up also the first three dimensions of the concept, Marx shows that within capitalism the real conditions of production, including natural powers (e.g. the earth), are now

> posited in and through the process itself as alien, independent existences; in other words as the mode of existence of an alien person, as self-sufficient values-for-themselves, and thus as values which form wealth alien to the subjective labour capacity standing in isolation from them, the wealth of the capitalist. (Marx 2010, p. 389).

But this was not the case in the precapitalist agrarian communities defined by the collective ownership of the land as Marx shows, it entailed "appropriation of the natural condition of labour, of the earth as the original instrument of labour, both as workshop and repository of raw materials" (Marx 2010, p. 409). In this section of the *Grundrisse*, the main model of non-alienated living labour is the farmer of pre-capitalist systems, for whom there is not yet the "absolute separation" between "the power of living labour and the conditions of its realization" (Marx 2010, p. 413). This use of living labour as a tool to analyze the "precapitalist relations of the 'working subject' to nature" (Saito 2018, p. 47), as Saito writes commenting the same

passage, also enables us to grasp the ecological potentialities of this concept. As I argue, this standpoint of living labour expresses in concrete terms, within the experience of the worker, the subjective side of James O'Connor's second contradiction (O'Connor 1998).

The kind of ecomarxism that can be developed on the basis of this kind of analysis of living labour is quite different than the one of the Oregon school. It is of course a question of method: as often pointed out, the metabolic rift approach has constructed a dogmatic system of an ecologist Marx which never existed. This implies also a critical divergence: the metabolic rift school abusively generalizes the model of analysis of the damage caused by intensive agriculture to criticize all ecological catastrophes, unjustifiably privileging the critical category of alienation to the detriment of domination, extraction and the destruction of nature so that it downplays the ecocidal dimension of capitalism (the death of living individuals, human and non-human, extinction of plant and animal species, the collapses of ecosystems). But above all there is a political and strategical disagreement concerning the promotion of "scientific socialism" (see for example Foster & Clark 2020, p. 261). For example, Foster considers ecological revolution as the process of developing an ecological "higher level" science under political control of a proletarian State (ecosocialism from above compatible with technosolutionism), rather than the process of democratic revolution of labour and social relations (ecosocialism from below compatible with degrowth). Crucially, the dominant metabolic rift theories ignore workers' and eco-unionists' struggles, and do not allow to conceive the forms and institutions of an ecologization of the production system, or the political roles of workers and inhabitants in the ecological revolution. In short, it fetishizes science and depoliticizes work.

On the contrary, I will now show how an ecomarxist political ecology of living labour can put forward an eco-unionist strategy and propose eco-councilist institutions to promote another type of ecosocialist project.

2. *Eco-unionism against green capitalism*

Eco-unionism refers to the alliances between unionists, residents, and environmental activists that enable common inquiries, struggles, counter-projects and strategies confronting green capitalism. The most direct paths from living labour to ecological concern often arise

from experiences such as industrial and climate disasters, the deterioration of health at work and environmental health, the discovery of our attachment to living beings and ecosystems, and the confrontation with real work under new environmental requirements (Cukier, Gaborieau & Gay 2023). But there are other ways to ecologize living labour, through struggles, inquiries and alliances which arise from the politicization of the territorial embeddedness (as in the ex-GKN struggle), the pursuit of material autonomy (as in the ZAD of Notre-Dame-des-Landes struggle), or, as I will show now, of the quality of labour (as in the ONF's forestry workers' struggle) and the technical mastery of work (as in the refinery workers of Total Grandpuits' struggle). In my perspective, these eco-unionist experiences, however limited and partial they may be, can help to reshape what ecosocialism in the age of "catastrophe capitalism" should be.

3. *From the union reflection on the quality of work to the "Call for a Living Forest": the struggle of ONF forestry workers*

Since 2018, workers at the French National Forestry Office (ONF) have been mobilizing against job cuts, performance-based contracts and the extractivist and productivist logic being imposed on them by the French State, which treats forests increasingly as spaces to be exploited and made profitable, even as they are weakened by climate change and pollution (Glinel 2023).

In response, the Snupfen Solidaires and CGT Forêt unions have engaged in a struggle to defend the quality and meaning of forestry work, and have built alliances with environmental associations (such as Réseau d'Action Forestière and SOS Forêts) within an activist platform linked to their common "Call for a Living Forest" in 2021. This eco-unionist alliance has enabled initiatives such as the March for the Forest in 2018 and the Assembly for Living Forests in 2023, that were made possible because the environmental activists accepted to investigate together with the workers and pay attention to their working conditions, the new risks and accidents created by the machine-led intensification and individualization of labour, and the ecological meaning of their work. Conversely, the unionists' reflection on the quality of their work, also informed by a co-research process conducted with academic researchers in psychodynamics of work, has allowed workers to articulate their struggle in terms of politicization

of their living labour. As Snupfen Solidaires unionists write, this has highlighted notably

> […] the importance of the collective redefinition of the doctrine—in the case of public foresters, this means how the missions assigned to the ONF by the State are articulated: the protection of forests and biodiversity, wood production, and the forest's social function. In other words, this concerns the future of public forests and the quality of work. (Dall'Armi, Pons & Tellechea 2018, p. 109).

Through their struggle, co-research and alliances, workers were able to develop the political meaning of their doctrine of living labour – what they call "irregular sylviculture" or "uneven-aged sylviculture" in which trees of varying ages and sizes coexist and contribute to the reproduction of the forest ecosystem, in contrast to the "even-aged silviculture" of monoculture. In short, it is through an inquiry into the living labour of forest workers and the social and ecological significance of "irregular silviculture" that the alliances and practical utopia around living forests could emerge. Living labour here refers to workers' attachment to their professional practices and gestures, linked to a specific kind of social relationship with nature which founds a critical standpoint on the extractivism of their State employers. I claim that eco-unionist alliances and shared political positions between workers, residents and environmental activists have been possible because the latter accepted to "enter into the woods" and inquire with the workers on their living labour, so that they were able to link the deterioration of forest workers' conditions and the degradation of forests due to climate change.

4. *Politicizing workers' knowledge to confront green capitalism: the struggle of the Total Grandpuits refinery workers*

In early 2021, workers at Total's Grandpuits oil refinery – led by CGT unionists – went on strike in opposition to TotalEnergies' plan to convert the site into a so-called "zero-oil platform", a typical green capitalist project of biomass energy involving the elimination of 700 jobs. Together with their environmental allies (notably Greenpeace France and Les Amis de la Terre) within the "Plus jamais ça" activist platform (renamed afterwards "Alliance écologique et sociale"), the workers de-

nounced this project as an instance of "greenwashing covering up social destruction" (Hammerli 2023). The workers and their allies questioned the true ecological value of the plan and developed a project for an alternative industrial reconversion, without job losses and focused on the production of green hydrogen, biogas, and hemp-based materials. However, due to an unfavourable balance of power and a lack of economic guarantees, the movement could not continue – and in 2025, Total Grandpuits workers continue to face new layoff plans.

How can this alliance be understood? On the one hand, the workers needed the expertise of environmental organizations to build a counter-expertise. As Arthur put it:

> Val and I said, 'We need to go after Total on ecological grounds,' and the best way to dismantle ecological arguments is when it's ecologists themselves doing it. [Interview, 30/04/2021] (Hammerli 2023, p. 51).

On the other hand, Adrien Cornet, CGT site delegate and one of the movement's spokespeople, emphasized that an ecological alternative is only possible if it is grounded in the technical, ergonomic, and environmental knowledge of the workers:

> That's what we tried to do at Grandpuits: convince both the workers and, more broadly, the environmentalists, that the working class is the solution to driving ecological struggles. It is, in any case, the only class that possesses both the balance of power and the knowledge of the tools of production necessary to shift them toward real ecological goals. Workers' control over the means of production is fundamental. (Quentel 2022).

He further explained that workers "know very well what they are discharging" into the river that borders the site and into the Seine… but they also know how not to do it, provided they work within the right framework. Here, living labour refers to the experience and knowledge of tools, work processes, and their consequences – especially environmental and health-related. And the ecological meaning of work is constructed through the mediation of a sense of responsibility and agency, rooted in technical mastery of the means of production, understood as the condition for eco-unionist alliances and ultimately for an ecological redirection of the energy sector.

5. *From eco-unionism to council ecosocialism*

In my perspective, such eco-unionist inquiries and struggles challenge many dominant views within ecological Marxism, and constitute milestones toward what I call a "council ecosocialism" project, based on new institutions allowing workers and residents to democratically decide concerning needs, economic planning and the organization of work.

1. There is first of all a problem with the "climate-class struggle" strategy – not only because, as for example Matthew Huber's ecomodernist "proletarian ecology" (Huber 2022) argues, they represent a regression falling short of ecological Marxism understood as an anti-productivist refoundation of Marxism, but also because they fail to consider concrete social and ecological labour struggles, which in the vast majority of cases, in the global North as in the global South, imply alliances between industrial workers, peasants, service workers and residents, ecological activists, feminist activists and indigenous movements. Eco-unionism does not mean a separate "union's ecology", a dogmatic position which has been defended recently in France for example by a tendency within the CGT that opposed national alliances with ecological organizations such as the Alliance écologique et sociale. Unions must play a central role, but their role is to make visible living labour and to politicize it by making alliances around this process with the residents and activists.[1]

2. The option of "ecological activism", as the construction of a power relationship with the State aimed at blocking ecocidal projects, is no less problematic than the greening of class struggle. We can challenge here Andreas Malm's strategic arguments (see for example Malm 2021): to end fossil economy for example, it is not enough to block, sabotage, and dismantle their infrastructures (which leads him to focus entirely on the relationship between activism and state coercion), but there is also a need to ecologically reconvert a part of the industries and know-hows of energy workers and to socialize them. This "dismantlement / reconversion / socialization" ecosocialist strategy I defend requires primarily to conquer and secure new rights and powers for workers, such as the "professional and ecological social

[1] I refer here to the typology of ecomarxist strategies we have proposed with Paul Guillibert (Cukier & Guillibert 2025, p. 17 ff.).

security" that would allow a continuity of wage, social and training rights regardless of the job or employment status.[2]

3. The Green New Deal proposals, even the more radical, also disregard actual labour and workers' problems and struggles (Cukier 2020). As democratic as they claim to be, Green New Deals perpetuate the dangerous fantasy "let's finance green jobs and the stewardship will magically follow!", without providing workers with the social, economic and political means to realize the plan. Ultimately, this technocratic logic, dismissive of the embodied and living knowledge of workers, is unlikely to withstand the lure of technosolutionism. In such planning, workers are simply the executants of the transition and, at the end of the day, as in green capitalism, collateral (yet heroized) victims rather than strategists of ecological redirection.

4. Finally, the most crucial question about ecosocialist projects concerns the institutions which would allow to articulate the democratic planning and self-management of needs and work. For Michael Löwy for example:

> While the decision, made through the planning system, to transform, say, an auto-plant into one producing buses and trams would be taken by society as a whole, the internal organization and functioning of the plant should be democratically managed by its own workers. (Löwy 2007, p. 299).

However, as shown by concrete eco-unionist struggles, workers, residents and activists must inquire together and simultaneously about the conditions for redirecting productive activity and the ecologically sustainable social needs, on the basis of their attachments to practices, territories, and living beings. On a broader scale, I claim this would require new democratic institutions at the levels of the territories, the economic sector and the production unit. In social councils, at various territorial scales, residents would be enabled to democratically decide on their needs and on the correlated general objectives of production within natural limits – for example to achieve a socially just reduction in energy consumption. In economic councils, representatives of the workers of an economic sector would be enabled to democratically

[2] See the first part of the eco-unionist activist book to which I have contributed, *Travail, climat : même combat !* (Attac 2025).

decide on the correlated reorganization of the production system – and for example to plan the decarbonization, depollution and decommodification of the energy sector. And in workplace councils, within each working collective, all workers would be empowered to make decisions on the organization of work in order to implement these planned decisions – for example to make labour processes in the energy sector safer, sober and autonomous. The functioning of these new institutions would require to include the democratic activity in these councils within the working time, which could be made up in such an ecosocialist society of a third of production, a third of inquiry and training and a third of democratic work.[3]

These are however general proposals, aimed at arousing debate around my main argument: the centrality of politicizing living labour in order to reactualize ecomarxist theories, eco-unionist strategies and ecosocialist projects for our times of struggles all at once against green capitalism, fossil fascism and ecological catastrophes.

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[3] See the chapter "Workers' Councils and Council Democracy" and the conclusion of my *Democratic Work* (Cukier 2023).

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Climate change and tropical fruits: a capitalist (mal)adaptation in Southern Italy

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Abstract

Current capitalist agriculture is responsible for one third of GHG and use 15-30% of global energy; more broadly, the agricultural sector is considered to be pivotal in the development of capitalism and its futures, as what happens in the countryside has important repercussions on cities, industry and politics.[1] The question of the agro-ecological limits of the global production system has become part of the climate issue,[2] suggesting how food and agriculture become 'sustainable' only overcoming the paradigm of unlimited economic growth.[3] In this scenario, the Mediterranean area is one of the most vulnerable to the effects of current climatic change: here, ecological changes are affecting agricultural production, reconfiguring both productive spaces and imaginaries. We take the example of tropical fruits production in Southern Italy – in particular in Sicily – as example of capitalist (mal) adaptation to climate change, conceived as a new strategy for novel market niches nurtured by commercial narratives and self-propelled within the scientific community.[4] Integrating climatic-ecological territorial data with the analytical tools of Political Ecology and Critical

[1] Paprocki & McCarthy 2024.
[2] Campbell et al. 2017.
[3] Asara et al. 2015; Bodirsky et al. 2022; Hickel et al. 2022; McGreevy et al. 2022.
[4] Farina 2020; Tinebra 2021.

Geography we explore the conditions which exacerbate socio-ecological relations related to territories with a high risk of desertification, food/water scarcities and socio-political disentanglement. We finally explore possible future scenarios in a post-growth strategy which prioritise 'food sufficiency' and food as a 'common good'.[5]

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Keywords: climate change, Sicily, tropical fruits, agri-food systems, maladaptation

1. *Introduction*

Agriculture has long occupied a paradoxical position within global capitalism: it is at once the material foundation of human subsistence and a central driver of ecological degradation. Contemporary industrialized agriculture accounts for roughly one-third of global greenhouse-gas emissions and between 15% and 30% of total energy use.[6] As the sector most intimately dependent upon biophysical processes, agriculture is simultaneously *driving* and *affected* by the climate crisis – a crisis that is profoundly social and political in its origins and consequences. Within the Mediterranean basin, climatic transformations are advancing at nearly twice the global average;[7] these shifts are re-drawing the ecological boundaries of cultivation, prompting new agrarian imaginaries and adaptation strategies that reveal the deep entanglement between climate change and the capitalist mode of production. Scholars in ecological economics and degrowth studies argue that the pursuit of endless economic expansion is incompatible

[5] Di Masi 2022.
[6] Paprocki & McCarthy 2024.
[7] Lionello & Scarascia 2018; ISPRA 2021.

with the biophysical thresholds of the Earth system.[8] Political ecology and critical geography have shown that capitalist agriculture operates through processes of *accumulation by adaptation* – that is, the appropriation of ecological crisis as a new frontier for capital circulation.[9] The Mediterranean emerges as both a *climate hotspot* and a laboratory of adaptive experimentation. Rising temperatures, prolonged droughts, and declining precipitation threaten the viability of traditional crops such as citrus, olives, and vines.[10] At the same time, these conditions are discursively reframed as opportunities to introduce new, "resilient" or high-value species. In Southern Italy – particularly in Sicily – this process has taken a distinctive form: the expansion of tropical and subtropical fruit cultivation, notably mango and avocado, alongside experiments with banana, sugarcane, and even coffee.[11]

This short paper, combining climatic and ecological data with qualitative fieldwork and discourse analysis, tries to address how tropical-fruit expansion exemplifies a case of capitalist (mal)adaptation, its socio-ecological consequences (for water, land and rural labour), and alternative pathways, which might foster more just and sustainable food futures.[12] In short, we want to stress how what appears as adaptation to climate change is in fact an adaptation of capital rather than of ecosystems. By exposing these contradictions, we contribute to debates on how to envision agrarian futures beyond growth and accumulation.

2. *A political ecology approach: from ecological Marxism to post-growth commons*

The secret of the flourishing state of industry in Spain and Sicily under the rule of the Arabs lay in their irrigation works. Favourable natural conditions can provide in themselves only the possibility, never the reality of surplus labour, nor, accordingly, the reality of surplus-value and a surplus product. The result of differences in the natural conditions of labour is this: the same quantity of labour

[8] Bodirsky et al. 2022; Hickel et al. 2022; Asara et al. 2015.

[9] Heynen, Kaika & Swyngedouw 2006; Paprocki & McCarthy 2024.

[10] Ciscar et al. 2018; Spano et al. 2020.

[11] De Michele, Calabrese & Barone 2005; Lauricella et al. 2017; Gianguzzi 2020.

[12] Jacobi, Villavicencio Valdez & Benabderrazik 2021.

satisfies a different mass of requirements in different countries, and consequently under otherwise analogous circumstances, the quantity of necessary labour-time is different. These conditions affect surplus labour only as natural limits, i.e. by determining the point at which labour for others can begin. In proportion as industry advances these natural limits recede.[13]

The quotation above shows how Marx already recognized how the logic of capital accumulation drives the exploitation of the earth. However, when the sustainability conundrum appeared and coupled along with the agrarian question in the 20th century, these ecological dimensions were largely overlooked.[14] Today, at last, it seems quite clear how capitalism and the agro-ecological question are deeply intertwined, as the constant drive for profit often promotes industrial agriculture that prioritizes short-term gains over ecological balance. "Thus, just as we can no longer consider the heart of the agrarian question […] without substantial attention to climate change, neither can we adequately conceptualize the effects of climate change, including climate adaptation and mitigation strategies, on agrarian environments and societies without situating them within the context of contemporary capitalist development".[15] As a matter of fact, the capitalist configuration of continuous bio-physical transformation of *raw* nature into commodities tends to favor monocultures, chemical inputs, and large-scale production, leading to soil degradation, biodiversity loss, and social inequities.[16] Capitalism's emphasis on profit-driven agricultural expansion has in fact intensified ecological degradation, as shown by recent global emission trends:[17] such data il-

[13] Marx 1976 [1867], pp. 649-650.
[14] Ravipati 2024.
[15] Paprocki & McCarthy 2024, p. 3.
[16] Heynen, Kaika & Swyngedouw 2006.
[17] A recent report from FAO (FAO 2018) showed how agriculture and related land-use activities generated 9.3 billion tonnes of CO_2 equivalent (CO_2eq), reflecting the environmental cost of industrial farming. Methane and nitrous oxide from crop and livestock production – driven largely by large-scale, livestock systems – accounted for 5.3 billion tonnes CO_2eq, marking a 14% rise since 2000. Livestock alone contributed 3 billion tonnes CO_2eq, underscoring how current agriculture prioritizes mass production over ecological limits. Land use changes added another 4 billion tonnes CO_2eq, mainly from deforestation and soil degradation tied to agricultural expansion. Although deforestation-related emissions declined slightly, emissions from draining and burning organic soils rose by 35%, indicating persistent unsustainable practices.

lustrate how capitalist agricultural systems exacerbate the agro-ecological crisis by valuing output and profit above ecological sustainability and resourcefulness.[18]

From a Political Ecology (PE) approach, we conceive here "Nature" as a complex socio-natural and political construction.[19] Human transformations of natural ecosystems cannot be understood without considering the political and economic structures and institutions within which these transformations are embedded, revealing the power relations that shape processes of environmental resource management and transformation. PE studies have helped deconstruct modernist narratives, offering alternative explanations of major environmental issues related to climate change – such as scarcity, famine, and desertification – by linking them to socio-economic inequalities, environmental injustice, gender imbalances, and the organization of natural resources within the market economy.[20] In current socio-food systems, the intensification and expansion of agricultural production still ignores the social and environmental costs of this process, thus ignoring how food regimes are also ecological regimes (*ibid*). PE challenges governance systems and the economic, technological, and social institutions that produce inequality in the access to and distribution of ecological resources; it reveals winners and losers, hidden costs, and uneven social and environmental outcomes across different geographic scales.[21]

In the midst of climatic turbulences, as temperatures raise anywhere, different responses to current economic impasses are born: the case we here pictured of tropical fruits expansion in Sicily, is one of these types of adaptation. In this work, we highlight how this process is problematic (both politically and bio-physically) as it constitutes a case mal-adaptation or, in other words, a "capitalist re-adaptation". This goes in the same direction to what Pohl & Swyngedouw recently questioned as a "defense of maladaptation",[22] i.e., the nurturing of post-political scenarios of neoliberal ecological resilience. The term *maladaptation* is used here in its political-ecological sense, denoting responses that, while economically adaptive, exacerbate existing socio-ecological vulnerabilities.

[18] MacKinnon & Derickson 2012.
[19] Galt 2013.
[20] Benegiamo 2022, pp. 157-169.
[21] Emel & Neo 2015; Trauger 2022.
[22] Pohl & Swyngedouw 2025.

In Sicily, the adoption of water-intensive tropical crops in semi-arid territories illustrates a contradictory logic: the same climatic stresses that undermine traditional agriculture are re-inscribed within new accumulation strategies that deepen water scarcity and environmental inequality. Narratives of "zero-kilometer" production, local employment, and sustainable innovation obscure the material costs of these transitions – rising energy demands for irrigation, depletion of aquifers, and re-commodification of abandoned lands.[23] In this sense, climate adaptation becomes a new mode of capitalist reproduction rather than a path toward ecological sustainability and resourcefulness.[24] More recently, the agro-ecological limits of the global food system have increasingly become part of the climate change debate,[25] emphasizing how food and agriculture are both a "cause and victim" of current climate change.[26] These approaches question market-based tools for achieving sustainable agri-food systems and reaffirms – both conceptually and practically – the relevance of practices developed by Indigenous, feminist, and degrowth communities as essential for food sovereignty, food justice, and ecological integrity.

At the core of our theoretical discourse is the idea that food (and food production) should be considered as both an object and a process that supports long-term physical health and well-being – framing food, in this sense, as a public good, respecting the carrying capacities of ecosystems, prioritizing food sufficiency, and reducing dependency on international trade.[27] In the era of erupting climate disasters, all efforts should bend towards food commoning and food democracy, in order to confront the worst effects of climate change, overcoming the relentless goal of growth for growth's sake.[28]

[23] Farina 2020; Tinebra 2021.
[24] MacKinnon & Derickson 2012.
[25] Campbell et al. 2017.
[26] Bodirsky et al. 2022; McGreevy et al. 2022.
[27] Nelson & Edwards 2020.
[28] Di Masi 2022; Hickel et al. 2022; Moragues-Faus & Marsden 2017; Asara et al. 2015.

3. *Climate change in the Mediterranean context*

The Mediterranean region is widely recognised as one of the world's main climate change "hotspots", where warming and aridity are advancing faster than the global average.[29] Average annual temperatures have increased by approximately 1.4 °C over the last century, with projections indicating a further increase of 2 to 4 °C by mid-century under current emissions scenarios.[30] At the same time, total annual precipitation has decreased by 10-20%, and the frequency of extreme events – heat waves, droughts, torrential rains – has intensified.[31] These patterns are not evenly distributed: southern Italy and the islands of Sicily and Sardinia show the greatest declines in precipitation and the greatest interannual variability, exacerbating soil degradation and water scarcity.[32] The Mediterranean climate trajectory is characterised by the dual process of warming and drying.[33] According to ISPRA,[34] about 70% of Sicilian territory is now classified as being at "high" or "very high" risk of desertification, while aquifer recharge rates continue to decline. Seasonal irregularities – such as shorter, more intense rainfall followed by prolonged droughts – further compromise the reliability of surface water reservoirs, complicating irrigation and crop planning.

These climate dynamics have profound implications for Mediterranean agriculture. Traditional crops – citrus fruits, grapes, olives, and cereals – evolved within relatively stable seasonal cycles and moderate water availability. Their phenological rhythms are now increasingly disrupted. Earlier flowering and ripening periods, increased pest pressure and declining yields have been reported across southern Europe.[35] The cumulative effect is not merely biophysical, but structural: existing irrigation networks, designed for 20th-century hydrological regimes, are unable to accommodate new extremes.[36] Water losses in municipal and agricultural distribution systems reach 45-55%, re-

[29] Lionello & Scarascia 2018.
[30] ISPRA 2021; Hristov et al. 2020.
[31] Viola et al. 2014; Ciscar et al. 2018.
[32] Basile & Panebianco 2010.
[33] MASE 2022.
[34] ISPRA 2021.
[35] Iglesias et al. 2011; Hristov et al. 2020.
[36] ISTAT 2023.

vealing profound infrastructural obsolescence. At the same time, climate change opens up a speculative frontier. Rising average temperatures and longer frost-free periods make it *technically* feasible to grow crops previously limited to tropical or subtropical latitudes. Agronomists, investors, and policymakers have thus reframed warming as an opportunity for diversification and competitiveness. In Sicily, the introduction of mangoes, avocados, and other tropical fruits is promoted as a rational adaptation to new climatic realities – a narrative that aligns with the broader European discourse on "climate-smart agriculture".[37] However, as empirical data reveal, these species require abundant and stable water supplies precisely when these resources are becoming scarcer.

Water scarcity is the critical bottleneck for Mediterranean adaptation. In Sicily, average annual rainfall has decreased by about 147 mm over the last eight decades.[38] Often unregulated groundwater extraction has intensified to compensate for the decline in surface water. Salinisation of coastal aquifers is now widespread, while the energy costs of pumping and desalination are rising. Technical 'solutions' – new wells, desalination plants, or drip irrigation systems – are therefore embedded in broader regimes of accumulation and governance. These trends have direct implications for land use. Marginal lands abandoned during previous agrarian crises are being revalued for tropical production through public incentives and private investment. These land reclaiming efforts often displace smallholders and intensify competition for water between sectors – particularly between agriculture and tourism, the island's two main consumer sectors.

National and EU frameworks, such as Italy's *Piano Nazionale di Adattamento ai Cambiamenti Climatici*,[39] emphasise efficiency, innovation and market competitiveness as pillars of resilience. Although these policies recognise regional vulnerabilities, they often depoliticise the structural causes of environmental degradation – land concentration, water privatisation and export-oriented production models. Framing adaptation as a technical challenge to be solved through better infrastructure or new crops, effectively silences issues of social

[37] Cornara et al. 2020; Testa et al. 2018.
[38] Basile & Panebianco 2010.
[39] MASE 2022.

justice and ecological limits.[40] Within this post-political configuration, the introduction of tropical fruits in Sicily emerges as a paradigmatic project of *green modernisation*, reconciling growth with environmental concerns at the rhetorical level, while deepening material contradictions. The same infrastructures that enabled export-oriented agriculture – reservoirs, aqueducts, plastic greenhouses – now amplify vulnerability under new climatic conditions. On the other hand, traditional agroecological practices, long marginalised as "inefficient", may offer paths to genuine adaptation, emphasising soil conservation, polyculture and water harvesting.

4. *Sicilian tropics: an example of capitalist (mal)adaptation*

Since the 2000s, tropical crops have achieved growing productive and commercial success in the Mediterranean area. In southern Italy, and particularly in Sicily, the main production centers have emerged in a fragmented manner across several provinces (see map in Fig. 1): in the areas of Palermo (Balestrate), Messina (Milazzo), Catania (Acireale, Giarre, Piana di Catania, Fiumefreddo), and Syracuse, where many cultivars have been tested and now compete with traditional crops such as vines and oranges.[41] Although the market continues to grow, much of the production is destined for the European market, where tropical fruits have long been considered "superfoods," that is, foods with highly valued health benefits.[42] Today there is great enthusiasm for tropical fruits, especially mango and avocado; also, recently, a famous brand decides to cultivate bananas in Sicily and more and more companies are (re)discovering sugar cane cultivation or coffee production. Although this has been a non-linear process, this paragraph attempts – briefly and by no means exhaustively – to trace the underlying reasons for this enthusiasm for these types of crops. First of all, it is worth recalling that no crop can be considered "typical" in an absolute sense, and that citrus groves and sugar canes have long played a crucial role in Sicilian agricultural history, dating back to the Middle Ages.[43] Chronologically, the process of tropical experimentation, can

[40] D'Alisa & Kallis 2016.
[41] De Michele, Calabrese & Barone 2005; Lauricella et al. 2017.
[42] Gianguzzi 2020; Sgroi et al. 2023.
[43] Morreale 2006.

be outlined starting in the 1980s, with the first local trials, followed by the start of commercialization in the 2000s. From that point onward, production gradually evolved into genuine polycultures of tropical products, reaching around 500 hectares across the island at present time. The main reasons driving the shift toward tropical crops are: the arrival of new pathogens; changing dietary habits; cyclical citrus crises caused by market competition (within and beyond the Mediterranean area); climate change and the accompanying discourse on the future of agriculture; the growing demand for tropical products in both national and international markets. The narratives which accompany such process – that is, the "natural" transition toward tropical crops as both economically advantageous and biologically necessary – has substantially seen a substantial overall alignment among all key actors (commercial, scientific, institutional).[44] They, in fact, create a "win-win" discursive framework that functions as a powerful promotional tool. The main arguments supporting the transition to new crops can be summarized as follows, which see tropical fruits as:

1. local, zero-kilometer products, saving CO_2 emissions from transportation;
2. better tasting products (at least as good as those from tropical countries);
3. they help redevelop abandoned agricultural areas (previously dedicated to citrus);
4. job creation (especially for young people);
5. a reflection of multi-identity – cultural and culinary – that characterizes Sicily and the Mediterranean, shaped by exchanges, contaminations, and migrations.

Beyond these enthusiastic claims, however, tropical fruit cultivation requires high temperatures but sufficient rainfall. Yet, as the literature shows, while temperatures in Sicily have indeed risen (and are expected to rise further), rainfall has not increased accordingly; rather, overall aridity is projected to worsen[45]. As reported by Basile and Panebianco,[46] already over a decade ago "average air temperatures over land have been increasing throughout the year; the long-term trend shows a regional rise of about 1.38 °C [...] and a substan-

[44] Delatin Rodrigues & Di Quarto 2023.
[45] Viola et al. 2014.
[46] Basile & Panebianco 2010.

tial decrease in total annual rainfall, with a reduction of about 147 mm." This trend makes agricultural production increasingly difficult across the Mediterranean region. As Iglesias et al.[47] confirmed, "Climate change will be a main determinant of future agriculture in the Mediterranean region, primarily by imposing further pressure on already scarce water resources [...]. Water scarcity in the Mediterranean is expected to rise in the next decades – posing additional problems for water management and users. [...] This implies that the economic prospects for expanding fruit and vegetable production are limited." This issue is also highlighted in a recent ISTAT report,[48] which – within a broader systemic perspective – points to the poor quality of water infrastructure, leading to losses of about 45-55% of the total water supply.[49]

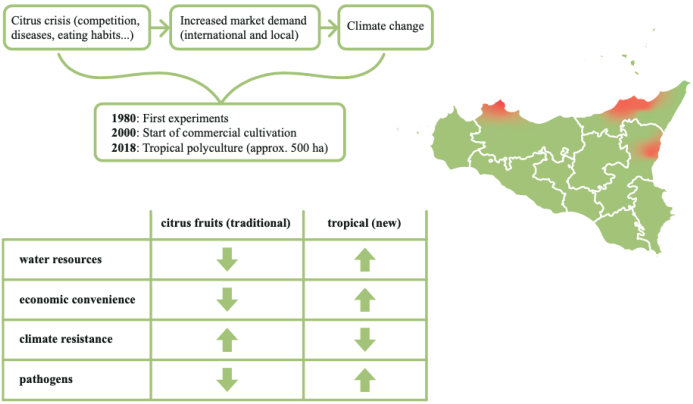

Figure 1 – Evolution, comparison and distribution of Sicily's tropical crops

[47] Iglesias et al. 2011.
[48] ISTAT 2023.
[49] As our interviews revealed, the water issue is indeed central: "For us, higher temperatures mean more summer fires, which are a huge problem… along with hydrogeological instability and damaged roads…" (Int.1). "There is no real problem with water: we have our own well… but, of course, sometimes the groundwater turns salty and needs to be desalinated." (Int.2).

The issue of record-high temperatures, combined with the recent declaration of a drought emergency, highlights how the economic opportunity of investing in new agricultural products represents only one side of the worsening consequences of climate change. Nevertheless, as recently showed by Del Cerro,[50] water plays a central role in Sicily, as it is intensively used in agriculture, which – alongside tourism – constitutes one of the island's primary economic sectors. Droughts and water scarcity can also be socially constructed and produced as Giglioli and Swyngedouw demonstrated,[51] even if portrayed as an *emergencial*, temporary and/or technical problem. That is why, the alignment among stakeholders regarding technical solutions to counter drought and soil aridity – given rising temperatures and declining water availability – appears thus to be driven primarily by economic motivations rather than by purely technical or agronomic considerations. In this direction, we also argue that this is a result of long-standing systemic issues that require comprehensive political and social change: despite this, future climatic projections are to be intended as possible worsening factors of current water issues.

5. *Concluding remarks*

The Mediterranean area is one of the most vulnerable to the effects of current climatic change, as ecological changes are affecting agricultural production, reconfiguring both productive spaces and imaginaries. The example of tropical fruits production in Sicily here analysed, represents a local (mal)adaptation to climate change of capitalistic production. This particular type of "capitalist re-adaptation", represents an economic response to climate change that deepens, rather than alleviate, environmental and social vulnerabilities. Under capitalism's profit-oriented logic, in fact, the rising demand for "exotic" and high-value crops such as mango and avocado, drives farmers and investors to introduce water-intensive species into regions already facing severe water scarcity and rising temperatures. This adaptation strategy prioritizes short-term market gains and export competitiveness over long-term ecological sustainability, relying on costly irrigation, groundwater extraction, and infrastructural investments that

[50] Del Cerro 2025.
[51] Giglioli & Swyngedouw 2008.

further strain local ecosystems. In this sense, the system adapts economically to climate change while simultaneously maladapting ecologically, reinforcing dependence on fragile resources and deepening inequalities in access to land and water.

The result is a form of "green capitalism" where climate discourse is used to justify profitable yet unsustainable agricultural transformations, where intensive production, monocultural agriculture and water conflicting dynamics, must be seriously taken into consideration for the future of this area. In short, this contribution showed that what appears as adaptation to climate change in Southern Italy is, in fact, a re-embedding of the agro-industrial system within a new climatic regime. It is an adaptation of capital, not of ecosystems. In line with Bodirsky et al.,[52] desirable future scenarios must thus envision local agroecological food systems with land, seeds, and water as shared commons; policy shifts, from industrial agribusiness toward community-supported agriculture; food sovereignty which would prioritise ecological regeneration over growth.

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[52] Bodirsky et al. 2022.

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The Quest for Hegemony? The European Green Deal, Accumulation in Late Capitalism and Climate Reality

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Abstract

In this article, I analyse the European Green Deal (EGD) as the EU's central response to ecological crisis from a historical materialist perspective. I start from the claim that contemporary capitalist accumulation is being reorganised around green transformation and that the EU uses the EGD as a vehicle for a renewed search for hegemony. I argue that the EGD treats nature in a highly instrumental way and embeds green policies in strategies of unequal accumulation pursued by European transnational actors. Bringing together Metabolic Rift theory's account of the dialectical relation between nature and society with a critical realist conception of hegemony, I place the EU's political economy within the structural dynamics of the capitalist mode of production. This framework shows why the EGD is not compatible with climate reality, understood as the convergence of biophysical limits and socioecological contradictions, and indicates the need for an alternative green transformation capable of repairing the metabolic rift between nature and society.

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Keywords: European Green Deal, Critical Realism, Metabolic Rift Theory, Hegemonic Projects, Climate Reality

1. *Introduction*

In recent years, the European Green Deal has become the main framework through which the European Union responds to ecological destruction and seeks to reconfigure its position in the global political economy. Marketed through the goal of climate neutrality, it is widely read as assigning the EU a pioneering role in building a more sustainable world order; liberal and neoliberal policy makers, together with some critical academics and activists, present the EGD as an alternative order for overcoming ecological crisis. I question this claim from a historical materialist perspective that foregrounds the class character of capital accumulation in late capitalism. I argue that the current restructuring process is organised around green transformation as the axis of a new accumulation strategy, and that the EGD has become an instrument of a renewed search for hegemony by Europe-centred transnational actors. Bringing together Metabolic Rift theory and a critical realist understanding of hegemony, I develop the notion of climate reality, which links the physical imperatives identified by climate science with the deepening socio-ecological contradictions of late capitalism. This notion allows me to discuss the material limits that make the EGD possible and how they are stretched or overridden.

The article proceeds in three main steps. In the first section, I discuss the emergence of the EGD, its ecological discourses and institutional architecture within post-crisis dynamics in Europe, and show how green transformation is constructed as a new accumulation strategy. In the second section, I elaborate a critical realist conception of hegemony together with Metabolic Rift theory to offer a framework that situates the political economy of the EU within the class and ecological contradictions of the capitalist mode of production and establishes the theoretical foundations of climate reality. In the third section, I analyse how the concrete policy instruments of the EGD operate in relation to this climate reality and demonstrate their incompatibility with it and finally discuss what kind of alternative green transformation is required to repair the metabolic rift between nature and society.

2. *Crisis Dynamics in Late Capitalism and the European Green Deal*

Although postwar European integration was presented in official discourse as a project of peace and prosperity, from the outset it functioned as a class project shaped by national and transnational fractions of capital. From the 1980s onwards, neoliberal restructuring and Economic and Monetary Union created an institutional order that restricted monetary and fiscal policy in favour of capital. While the European Central Bank adopted price stability as its single objective, full employment and social welfare were pushed into the background, and the Maastricht criteria together with subsequent fiscal rules limited states' capacity to pursue expansionary fiscal policies in favour of labour during crises.[1] The European project was thus constituted as a form of class rule that secured capital accumulation and subjected political decision making to the discipline of financial markets.

The financial crisis of 2007-2008 exposed the limits of this framework and became intertwined with the deepening ecological crisis and the dependence of European economies on fossil-fuel-based energy. While the losses of banks and financial institutions were covered by public resources, austerity policies pushed down wages, social rights and public investment, and states, in Streeck's words, were transformed into debt-paying apparatuses responsible not to citizens but to creditors.[2] At the same time, the visible effects of the climate crisis, fluctuations in fossil fuel prices and concerns over energy security created both new risks and new profit opportunities for capital; financial fragility, energy deficits and ecological destruction converged into a single crisis dynamic that threatened accumulation.[3] The crisis therefore appeared not only as instability in the banking system or a problem of public debt, but as an instance of climate reality in which the land, water, climate and energy regimes sustaining production and reproduction became unsustainable.

In this context of multiple crises, the discourse of green growth and green industrialisation emerged as an accumulation strategy that promised at once an exit from stagnation and a response to

[1] Bieler 2006; Bieler & Morton 2004.
[2] Streeck 2014.
[3] Haas et al. 2021; Siddi 2020.

ecological crisis. Policy texts such as *A Green New Deal for Europe* presented eco-industrial investments as a means to create employment and restructure European capitalism, yet this vision soon narrowed into a limited industrial policy articulated to debt and market mechanisms within financialised capitalism.[4] Focusing on green investments, infrastructure projects, energy efficiency and carbon markets, this approach framed ecological crisis not as a structural contradiction produced by the historical responsibility of the capitalist states system, but as a technical risk to be managed through price signals and technological innovation, thereby obscuring both the material limits of climate reality and the class struggles emerging around these limits.

On this terrain the EGD was announced in 2019 as the central instrument of post-crisis restructuring and as Europe's "new growth strategy". The European Commission defines the EGD as a comprehensive transformation programme that combines the objective of climate neutrality by 2050 with the aim of enhancing competitiveness and energy security; it claims to integrate energy, industrial, agricultural, transport and financial policies within a single framework and to decouple economic growth from resource use.[5] From a Marxist political economy perspective, however, the EGD is not a neutral response to ecological crisis, but a capitalist project that reproduces late-capitalist accumulation under the banner of green transition. Through carbon markets, green taxonomy, the Carbon Border Adjustment Mechanism and critical raw materials strategies, the EGD seeks to reorganise value chains controlled by Europe-based fractions of capital, open new fields of investment and energy supply, and secure competitive advantage by shifting ecological costs towards the global South.[6] It should therefore be read not as a rupture that takes seriously the socio-ecological limits indicated by climate reality, but as a hegemonic class project that attempts to manage the metabolic rift produced by the capitalist states system by exporting it to different geographies; the following section on hegemony and Metabolic Rift elaborates this claim.

[4] Schepelmann 2022.
[5] European Commission 2019.
[6] Dunlap 2021; Dunlap & Larette 2022; Ajl 2022.

3. *Hegemony and Metabolic Rift: A Critical Realist Framework*

Critical realism is grounded in a stratified ontology that makes it possible to conceptualise the European Green Deal both through class relations and through the nature-society dialectic (Bhaskar 1979). It understands the social world as a set of internal relations between structures endowed with causal powers and the agents located within them. In this sense, the capitalist mode of production, property relations, state forms and integration processes at the EU scale are relatively enduring structural complexes, and the EGD should be seen as a regulatory intervention built upon these complexes.

From a critical realist perspective, hegemony is not reduced to the production of discursive consent. It is conceived as the condensation and continual reproduction, within the state apparatus and transnational institutions, of the interests that arise from the positions occupied by particular fractions of capital in processes of production and circulation, through legal regulations, policy packages and forms of common sense.[7] Jessop's notion of structural selectivity is decisive here. State institutions and multi-level arrangements such as the EU are not neutral arenas equally open to all social demands; they are selective condensations that privilege specific accumulation and hegemony strategies, draw in class projects compatible with these strategies, and systematically exclude alternatives. Hegemony should therefore be understood as the institutional and material assemblage of the capitalist class's attempts to manage ecological crisis to its own advantage and to consolidate global competitive superiority, crystallised in programmes such as the EGD.

Critical realist hegemonic analysis enables us to conceptualise the EGD, within the web of class relations that cuts across national, regional and global scales, as an intervention that restructures energy regimes, production chains and spatial arrangements in favour of capital and legitimises this process through the language of climate neutrality. While the EGD claims to reduce fossil fuel use, it simultaneously expands wind and solar infrastructures, green hydrogen corridors and battery-based supply chains, and redirects the extraction of lithium, cobalt and other critical minerals to Latin America, Africa and the European periphery. In doing so, it displaces ecological costs

[7] Joseph 2002.

to peripheral countries while securing energy supply and cheap input flows for Europe-based capital. Likewise, emissions trading schemes, the Carbon Border Adjustment Mechanism and green taxonomy are presented as technical tools for emissions reduction, yet reorganise production and trade in ways that safeguard the competitive advantage of European industry and push ecological burdens down the value chain. The very actors that produced ecological crisis within the capitalist states system are thus reconstituted, under the banner of green transition, as agents of new accumulation cycles that place even greater pressure on planetary metabolism.

Metabolic Rift theory conceptualises the socio-ecological terrain upon which this hegemonic project operates. Building on Marx's analyses of agriculture, soil fertility and the relationship between town and country, it examines how the capitalist mode of production severs, reorganises and subordinates to the imperative of accumulation the metabolic cycles that regulate flows of matter and energy between nature and society.[8] The one-way flow of nutrients from countryside to city, fossil-fuel-based energy regimes, mining and agricultural extractivism, and the commodification of land, water, climate and living beings transform nature from an external environment into a socio-ecological field that is both a constitutive condition of accumulation and a material limit to it.[9] In the reading offered by Foster, Burkett and Clark, the Metabolic Rift is not an abstract ethical debate about human-nature relations but the conceptual expression of the geological, biological and climatic devastation left behind as capital expands geographically.[10] This framework allows us to discuss green transition projects such as the EGD as strategies that do not repair existing metabolic ruptures, but reorganise energy regimes, material flows and mineral and energy supply chains in favour of new accumulation cycles.

The link between critical realist ontology and Metabolic Rift theory rests on conceiving nature not as an external stage for social processes but as an internal dimension of the mode of production. Labour power, infrastructure, land, water, climate and energy regimes are conditions of production on which capitalist accumulation rests, and they possess

[8] Foster 1999.
[9] Burkett 1999; Clark & Foster 2009.
[10] Foster 2000; Clark & York 2005.

causal powers of their own.[11] Critical realism reads these conditions as deep structural mechanisms on which capital accumulation operates and which simultaneously constrain it. The Metabolic Rift approach traces their material effects in climate instability, soil exhaustion and loss, water crises, deforestation and the collapse of biodiversity, revealing how capitalist production disrupts the circulation of matter and energy.[12] Hegemony thus comes to mean not only consent or coercion between classes, but the reorganisation of the metabolic relation between nature and society in favour of capital. Green growth strategies, carbon markets and financialised climate instruments are typical examples of such interventions; they turn ecological devastation into a manageable cost of accumulation while containing social conflict.[13] Within this theoretical framework, the EGD appears as a hegemonic project through which Europe-based fractions of capital reconstruct their accumulation strategy via the discourse of climate in the context of crisis in late capitalism. The concept of hegemony makes it possible to examine which class interests the EGD prioritises and through which mechanisms these interests are embodied in EU institutions and state forms, while the Metabolic Rift approach reveals how this project reshapes the nature-society metabolism and how it comes into tension with the material limits of ecological crisis.

4. *Climate Reality and the Limits of the European Green Deal*

I use the notion of climate reality to designate the historical conjuncture where the physical limits identified by climate science intersect with the socio-ecological contradictions highlighted by Metabolic Rift debates. IPCC reports show that the remaining carbon budget compatible with keeping global warming as far below 1.5°C as possible is being exhausted rapidly and that, if current emission trends continue, irreversible thresholds will be crossed within a few decades.[14] As Metabolic Rift theory underlines, this is not an abstract natural catastrophe but the material outcome of cumulative metabolic destruction generated by the capitalist mode of production in relation to land,

[11] Malm 2018.
[12] Malm 2016.
[13] Newell & Mulvaney 2013; Fairhead & Leach 2012.
[14] IPCC 2021; 2022.

water, energy regimes and the atmosphere.[15] Climate reality therefore does not signify a moral warning sent by nature to humanity but the return, through the geological and biological limits of the planet, of a debt historically accumulated by capital. Metabolic Rift names the process through which this debt has been created, while climate reality designates the historical moment when it begins to be called in. At this point the system of capitalist states does not relinquish its position as historical agent of ecological crisis; rather, through climate diplomacy and green transition rhetoric it seeks new hegemonic arrangements that shift this debt onto different classes and regions.

For Europe, this necessity must be thought in terms of both historical responsibility and existing capacity. Since the industrial revolution, Europe has played a central role in cumulative emissions and fossil-fuel-based industrialisation and is therefore among the principal agents of the present climate crisis.[16] From a Metabolic Rift perspective, Europe's historical development can be read as a long process of disrupting planetary metabolism: from coal and steel to petrochemicals and automobiles, through the one-way flow of food and nutrients from countryside to city, fossil-fuel-based energy regimes and global extractivist supply chains.[17] Climate reality therefore requires the EU not only to reduce emissions within its borders, but to radically reorganise its patterns of production and consumption, its energy regime and its global value chains at a scale and pace that would compensate for its historical emissions. In a just scenario, Europe would drastically reduce its use of energy and materials, abandon fossil fuels within a very short time frame, repay its ecological debt to the global South through climate finance and technology transfer, and replace market-centred mechanisms with a publicly planned transformation strategy. Climate reality does not call for a green patch on the logic of capitalist growth; it demands a break with that logic.

Measured against this requirement, the EGD appears as a framework that recognises climate reality yet reduces it to a risk field to be managed within capital accumulation. The EGD is explicitly defined by the Commission as a growth strategy that links climate neutrality to a new wave of industrialisation enhancing the competitiveness of

[15] Clark & Foster 2009.
[16] Hickel 2020.
[17] Foster 2000.

European capital.[18] The emissions trading system, carbon pricing, the Carbon Border Adjustment Mechanism, the sustainable finance taxonomy and a technological vision centred on hydrogen, carbon capture and negative-emission technologies turn the climate crisis into a field of governance through which financial products, new markets and profit opportunities can be created.[19] The discourse of a phase-out from fossil fuels coexists with the recognition of natural gas as a transition fuel, the inclusion of gas and nuclear in the category of "sustainable" investments, and a green industrial strategy built on critical raw materials. As Metabolic Rift discussions demonstrate, this approach does not fundamentally reduce energy and material throughput; instead it rebuilds planetary metabolic pressure in new forms by constructing carbon-intensive and mining-based infrastructures alongside existing fossil infrastructure.[20]

From the standpoint of climate reality this approach confronts two types of limits. The first is quantitative. The EU's 2030 emission-reduction targets and its vision of climate neutrality by 2050 are not compatible with the fair share calculated in scientific studies on the basis of Europe's historical responsibility and per-capita emissions. These targets imply a scenario in which the EU continues to draw on a significant portion of the remaining global carbon budget while shifting the burden of radical reductions onto poorer countries.[21] The second is qualitative. The EGD frames the climate crisis not as a structural contradiction that requires transforming patterns of production and consumption, property relations and the energy regime, but as an efficiency problem to be managed through green technologies and market incentives. Yet from a Metabolic Rift perspective, efficiency gains under the logic of capitalist growth are typically offset by new demand creation and spatial expansion; overall environmental pressure continues to increase.[22] The EGD's green-growth discourse reproduces precisely this dynamic.

These limits become even more apparent in Europe's external relations. The Carbon Border Adjustment Mechanism is presented as climate policy but in practice functions as a trade instrument that

[18] European Commission 2019.
[19] Newell & Mulvaney 2013; Fairhead & Leach 2012.
[20] Clark & York 2005.
[21] Hickel 2020.
[22] Foster 1999; Clark & York 2005.

protects European industry. While carbon-intensive production stages continue to be offshored to the global South and the environmental costs of these processes are imposed on local communities, the value added and technological rents embodied in final products remain concentrated at the centre. Investments in renewable energy and in biofuel, forest and carbon markets generate "green grabbing" processes through which rights over land and water are redistributed in favour of corporations.[23] Critical raw materials strategies open new mining frontiers for lithium, cobalt and rare earth elements, deepening extractivist violence in Latin America, Africa and Asia and threatening local communities' livelihoods. Metabolic Rift theory reveals that the EGD's claim to manage climate reality in fact entails prolonging Europe-centred accumulation at the cost of further disturbing planetary metabolic balances elsewhere.

For these reasons the EGD is a project that professes to take climate reality seriously, yet systematically suppresses the need to break with the logic of capitalist growth that this reality exposes. A critical assessment must therefore target not only the technical shortcomings of particular policy instruments but the hegemonic class character of the project, which is designed to deepen the Metabolic Rift. From an ecosocialist perspective, climate reality should not be understood as an opportunity for Europe to continue accumulation in a greener guise. It should instead be read as the historical necessity for a class-based alternative green transformation in which relations of production and social reproduction are radically reorganised through public planning, social needs and ecological limits.

From the vantage point of Metabolic Rift theory, repairing the rift between nature and society requires reorganising energy and material flows not according to the needs of accumulation but on the basis of social needs and ecological boundaries. This presupposes a three-level social transformation in relations of production and reproduction, accompanied by organised class struggle. First, without public ownership and democratic planning in key sectors such as energy, transport, housing and food, it is impossible to limit emissions and material use in line with social needs rather than market profit. Energy democracy, a radical strengthening of public transport and the cancellation of fossil- and mining-based mega-projects are concrete components

[23] Fairhead & Leach 2012; Clark & Foster 2009.

of this level. Second, shortening production chains, replacing industrial agriculture with ecological and labour-intensive agro-ecological practices, and establishing a welfare regime that centres reproductive labour while reducing working time are preconditions for rebuilding metabolic cycles at local and regional scales. Third, without recognising Europe's historical ecological debt and redistributing this debt in favour of the global South through climate finance, technology transfer and strict limits on extractivist mining, there can be no just metabolic repair at the planetary scale.

Such a transformation is not a merely technical reorganisation; it requires long-term class struggle that targets property relations, profit priority and the form of the state. Counter-hegemonic alliances between trade-union movements, ecosocialist organisations, feminist struggles and local ecological movements constitute the primary means for freeing the metabolic relation between nature and society from subordination to the logic of accumulation. An ecosocialist transformation of this kind understands climate reality not as a manageable risk for capital but as the material point of departure for a class-based counter-hegemonic project. It is in this opposition that the limits of the EGD become fully visible, as a historical choice between sustaining late-capitalist accumulation and genuinely repairing the Metabolic Rift.

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The nature-society dichotomy: the relationship between nature and women

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Abstract

This contribution aims to analyze the woman-nature binomial with reference to the historicization of their relationship and the correspondence of predicative attribution that has seen them subjected, with the aim of highlighting the implications that this correspondence has with respect to the macro-categories of human and nature used within ecological discourse. This work is carried out using a Marxist ecofeminist perspective, as a field of investigation that has made a major contribution to contextualizing the emergence of the concepts used in environmental discourse, showing how the reinterpretation of nature that took place during the rise of capitalism coincided with a redefinition of women through precise logical steps that saw these two subjects go from being considered "savage" to be dominated to "passive" once dominated. The examination of the attributes assigned to women and nature allows us to demonstrate the repercussions that historicization work has on theoretical redefinition, showing how their predicative commonality leads to questioning the very concept of nature in its formal distinction from that of human, thus nullifying the ontological dichotomy present in environmental discourse. Finally, we mention the implications of this deconstruction for the interpretation of the contemporary ecological crisis.

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Keywords: Nature, Human, Women, Savage, Passive

1. *Introduction*

This contribution focuses on the relationship between the idea of woman and the idea of nature, and on the way in which the attributes assigned to these two subjects have followed a common development functional to the stabilisation and consolidation of the capitalist system, and whose implications are reflected in the approaches to the environmental question. The aim of this contribution will be to reconstruct the theoretical steps involved in the designation of the predicates attributed to the subjects of this binomial, in order to delve deeper into the implications it has for the way in which ecological discourse is formulated. In particular, the attempt will be to show how the conceptual relationship between these two subjects can bring out the contradiction of an ecological discourse that investigates the environmental crisis through the macro categories of human and nature.

The perspective adopted will be that of Marxist feminists and ecofeminists,[1] who have linked the development of the capitalist system, the environmental crisis and the sexual division of labour, working in opposition to the essentialist view that interprets women as naturally closer to nature, denouncing this view as the product of the assimilation of "pseudo-ontological" models created by capital.[2] This research, focusing on the woman-nature binomial, has shown the importance of examining the predicates attributed to the classes of subjects involved in the ecological relationship, thus allowing for an analysis of their consequent placement in the two reference categories, namely human and nature, conceived within a dichotomous perspective. Following this work, in fact, the same categories can be investigated in their internal structure, revealing contradictions that undermine the concepts associated with them.

2. *Human/nature dichotomy, historical-political context and predicative analysis*

In order to see how the work of ecofeminist authors operates within the theoretical understanding of the ecological question, it is necessary to begin this contribution with a brief mention of what is meant

[1] Merchant 1980; Federici 2004; Guillauimin 2020; Barca 2024b.

[2] For further information on the different currents of ecofeminism, cfr. Bianchi 2012.

by the human/nature dichotomy, as it is the underlying structure of philosophical theories based on these two denotative categories. The dichotomous approach refers to a type of discourse, ecological and not only, which understands reality as characterised by two different ontological domains, whose relationship is not immanent but is realised through theoretical effort.[3] The human/nature "dichotomy" differs from the mere distinction of the two terms in that it implies a hierarchy of values within them that has a prescriptive and normative character. In fact, it establishes a qualitative distance between humanity and non-human nature, attributing a space of independence and autonomy to the first term with respect to the second, specifically the one of "society", an ontological category parallel to that of human. This theoretical framework, which still operates in contemporary narratives, is based on the assumption of a primacy of reason over other characteristics, which would confer superiority to the human category as the only rational one. Furthermore, by working only on an ontological level, it does not take into account the historical origins from which the concepts of nature and human have been formed, effectively hiding the political level which, on the contrary, allows us to question the actors present in both categories. This gap is filled by the work carried out in the field of ecofeminism, which, by examining the role of women within society, has shown how the predicates historically assigned to the latter correspond to those historically assigned to nature, and they have done so by involving the birth of the capitalist system, recognizing in it the roots of this correspondence.[4] This political system operated, in fact, on two levels, material and symbolic, whose combination allowed for the establishment of the initial dynamics of appropriation necessary for the functioning of the system itself. Specifically, the temporal context of reference that allows for predictive analysis refers to that used in the work of authors such as Silvia Federici[5] and Jason W. Moore[6] who trace the paradigm shift in the interpretation of nature, the former, and of women, the lat-

[3] Cfr. Moore 2015.

[4] A discussion of predicative designation in relation to nature and women would be incomplete without taking postcolonial studies into account, since the predicates assigned to women, nature and colonised peoples are intertwined. Due to lack of space, it is not possible to analyse them in detail here.

[5] Federici 2004.

[6] Moore 2015.

ter, from the crisis of feudalism and, therefore, from the century of the first enclosures and the colonisation of America by Columbus, since the first dynamics of appropriation and exploitation typical of nascent capitalism are located in this period. These two authors are followed by Carolyn Merchant, who places the culmination of this correspondence to the emergence of the mechanism, in direct agreement with the new economic and commercial orientation. This transition marked, in fact, the passage from an idea of the world as an organism that involved the representation of what we today call society as well as what we now call nature, to an interpretation of reality based on rigid binaries, functional for its organization with a view to economic profit. In this phase, the association of the figures of women and nature played a decisive role in creating a cultural background that could support the plan to degrade and use these subjects. There are those, like Carolyn Merchant,[7] who argue that the devaluation of women, along with the redefinition of labour roles, preceded the devaluation of nature, which was associated with women in order to legitimize its violation, while other authors, such as Colette Guillauimin,[8] argue on the contrary that it has been possible for society to appropriate women's bodies and work relegating them to the natural dimension. Regardless of this controversy, what is important is the fact that in this period we are witnessing a feminization of nature and a naturalization of women, where the use of one authorized the use of the other. In fact, their subjugation appeared necessary for the functioning of a system based on exploitation, since both were configured as «forces of reproduction»[9] that had to be made efficient and profitable.

This subjugation went through a process of domestication that, from a theoretical point of view, took the form of conceptual devaluation, which found its first legitimization in the change in the meaning of the concept of "savage" that is the first predicate assigned to them during the installation of capitalism. As Moore writes "As recently as fourteenth century, *savage* meant 'intrepid', 'indomitable'"[10] and therefore had a positive connotation. As political and economic conditions changed, this became a deroga-

[7] Cfr. Merchant 1980.
[8] Cfr. Guillaumin 2020.
[9] See Barca 2024, p. 18.
[10] Moore & Patel 2018, p. 45.

tory term used primarily to indicate in a negative way[11] what was opposed to a new idea of society that, as we saw earlier, was being built around the idea of reason as a human faculty capable of detaching itself from sensible conditioning and aimed at controlling them. In this sense the idea of "savage" was configured precisely as an irrational and uncontrolled activity, whose unpredictability had to be contained. Strictly speaking, this term was actually used to describe the character of all those entities that were interpreted as dangerous obstacles to the natural and social planning process. In this context, therefore, a concept of nature emerges in which it is portrayed as essentially unrestrained and uncontrollable in its ability to bring "violence, storms, droughts and general chaos".[12] This idea were created in direct opposition to the human category of society, which is presented as the main, if not the only, interested victim of such violence. This imagery, functional to legitimizing the "man's right over nature"[13] led to the assertion that, as Merchant reports "the earth without [human] toil and sweat produces nothing that is not deadly or venomous".[14] As the author also claims, "simbolically associated with unruly nature was the dark side of women"[15], who were represented by the figure, both abstract and real, of the witch, a term that encompassed all women who opposed the emerging order. Their resistance was, in fact, suppressed, as is well known, by witch hunts, whose function was not so much to punish individual acts as to eliminate general forms of female behaviour that were "made abominable in the eyes of the population"[16] by reference to the idea of savagery mentioned above. This widespread process of functional indoctrination during the period of transition from feudalism changed direction during the period of consolidation of the capitalist system, when the ruling class began to enjoy a growing sense of security. So, when the reference to the idea of savage to be dominated for the good of society exhausted its function of control, a different way of understanding women and nature was developed, one more adapted to conceiving of them as available resources to be appropriated for free. In fact, as Federici writes:

[11] The term "negative" refers to "what-is-not".
[12] Merchant 1980, p. 2.
[13] *Ivi*, p. 185.
[14] *Ibid*.
[15] *Ivi*, p. 132.
[16] Federici 2004, p. 170.

> Once women were defeated with the witch hunt, the image of feminility constructed in the transition was discarded as an unneccessary tool, and a new, tamed one took its place. While before women had been portrayed as savage, rebellious, insubordinate beings […] they were now depicted as passive.[17]

The emergence of the idea of passivity as a characteristic of these subjects is even more evident if we compare this passage with the birth of the mechanistic paradigm, in which nature began to be conceived as inanimate matter to be studied and analized. The attribute of passivity implied, in fact, that it could be broken down, dissected and manipulated at will, since it lacked internal forces and was governed by predictable and controllable physical laws. The establishment of this concept served to modify a cultural paradigm that now needed to legitimize the exploitation of human and natural resources, creating an image of nature as a female to be dissected through experiment and of women as pure weak bodies. The association between woman as a body and nature as a matter is significant in capitalism's desire to maximize the social utility of these two subjects. In fact, since matter and the body were conceived as passively constituted, they could be dominated and subjected to economic necessity, on the one hand through the idea of rationalization of natural goods from above, and on the other through the reference to a rationality capable of controlling needs, which could thus be regulated and ultimately suppressed. The historical reconstruction carried out thus far has theoretical implications that enable us to investigate the dichotomous human/nature form with which this work began, which also constitute the basis for its overcoming.

3. *Theoretical implications of predicative reconstruction and overcoming the dichotomy*

As we have seen, predicative attribution has seen women and nature move from being considered as "savage" to be dominated to "passive" once dominated, in relation to the different periods of capitalism. This brief historical overview not only reconstructs the social

[17] *Ivi*, p. 103.

and economic motivations underlying these designations, but also highlights the theoretical perspective regarding the internal structure of the dichotomy, starting with a focus on the subjects involved in the two macro categories of human and nature.

The overview of predicative designation highlight, in fact, two cardinal aspects of the dichotomous structure based on the primacy of reason, the analysis of which allows us to develop an interpretation aimed at its surpassing.

The first of these two aspects concerns the instrumental nature of the ontologization process, which aims to interpret these attributes as if they were limited to describing the essence of the subjects they refer to, in order to make their exploitation "universally" lawful from a theoretical and practical point of view. In fact, as we have seen, the physiognomy of this essence changes according to political and social needs. The significant side of this operation constitutes the second aspect, which is more closely linked to the theoretical contribution that this reconstruction allows us to illuminate. Indeed, it shows that both predicates, before designating something in themselves, were formed as relational terms relating to "that which is an impediment to the domination of Reason",[18] or rather as limit concepts that represent, precisely, the other-than-reason.

In light of these two moments, the human/nature dichotomy can be analyzed in a different way than is done within the strictly ontological perspective, which is internal both to philosophical debate and to the symbolic organization of capitalism. In fact, if it is based on the idea of the human being as characterized by rationality, which gives him a certain distance from the natural sphere, it is clear that the juxtaposition of woman-nature breaks down this structure and instead leads to the delineation of a different dichotomous picture. Indeed, the assimilation of the two subjects, which occurred through predicative commonality, shows the process of dehumanization to which women were subjected, breaking the theoretical barriers that this particular dichotomy implied. The dualism that emerges, having reason itself as its reference point, sees women and nature on one side and man and society on the other, thus revealing how the concept of human used in this dichotomy is in reality constructed solely on the characteristics of the latter, therefore of man and society. At the same time, on the

[18] *Ivi*, p. 152.

other side of the dualism, the partial humanization of nature, in its association with woman, and the related fact that this category includes both non-human and human subjects, leads to a rethinking of the very idea of nature which, rather than indicating specific beings, is now interpreted as a term historically created to include all the subjects that capitalism wanted to appropriate. In this sense, the broad scope of the concept of nature, in its encompassing both non-human and human subjects, and the partiality of the concept of human in its including of only some of them, leads to a crisis of both, which cease to be understood as designating something ontologically defined, revealing, on the contrary, their historical significance and their normative and prescriptive function. In this way, the analysis of the predicates of "savage" and "passive", conducted starting from the question of the relationship between women and nature, reveals the power dynamics hidden within the theoretical and cultural paradigm that constitutes the reference point for ecological discourse based on this dichotomy. The ontological deconstruction carried out here can, therefore, also prove significant in questioning the contemporary interpretation of the ecological crisis which, based on the operation of the paradigm criticized here, follows the same rhythm, described above, relating to the predicates. In fact, we look at climatic catastrophes through the idea of nature reacting wildly, and we think of the solution by looking at geo-engineering, which implies a return to the idea of nature as something that can be manipulated and, therefore, passive. Instead, the work carried out on the basis of ecofeminist analyses leads to an epistemological rupture whose consequences on the theoretical level are reflected on the practical level. This rupture leads, indeed, to the rejection of solutions that include a rigid delimitation of the areas of intervention. In fact, the elimination of the dichotomous system uncovers a relationality between entities that nullifies the possibility of thinking about the ecological crisis in the terms just described, where the relationship always implies a vertical and separate action of one actor on another, defining instead a space of equality and reciprocity. In this sense, the critique of the concepts of human and nature invalidates the consequent values hierarchy underlies what has been mentioned above, redefining a space in which to consider all the subjects mentioned on the same level, both in terms of the importance attributed to them and in terms of the behaviours to be adopted, thus laying the foundations for the liberation of all historically exploited subjects.

4. *Conclusion*

In conclusion, therefore, Marxist ecofeminist studies focusing on the analysis of the relationship between women and nature have enabled in-depth investigation of the human/nature dichotomy present in contemporary ecological debate. The reconstruction of the emergence of the predicates "savage" and "passive" attributed to women and nature has in fact laid the foundations for a reinterpretation of the subjects included in the two reference categories, revealing a different dichotomous structure that has led to the emergence of an interpenetration of the two, which has brought about the annulment of their distinction on an ontological level, showing, on the contrary, their purely historical character with a prescriptive role. In this way, the work carried out on theoretical crying has practical implications for the interpretation of the environmental crisis, opening up a space for investigation that foreshadows non-top-down solutions to the crisis itself.

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Beyond white supremacy in the European climate movement: Lessons from antiracist ecology experiences

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Abstract

Marxist anti-racist scholars have long argued that white supremacy, slavery, and colonialism are central mechanisms for labour exploitation in industrial societies. Today, although forms of colonial domination and modern slavery persist, labour exploitation continues to follow the colour line, with regard to working conditions and wages. Across Europe, environmental racism shapes the lives of racialised communities, who face greater exposure to environmental hazards while having limited access to ecosystem services. Yet, the European climate movement remains predominantly white. Envisioning socio-ecological transformation without centering antiracist and anticolonial principles risks reproducing white supremacy and undermining anticapitalist goals. Thus, analysing grassroots initiatives that place antiracism at the heart of ecological struggles is essential. A key example is Verdragon, the first "house of working-class ecology" in Bagnolet, France, presented in this paper as a short case study. Created by the "Front des mères", a parents' union fighting for better material conditions for children and teenagers in the banlieue, Verdragon advances a radical ecological project grounded in antiracism. It opens a horizon of collective liberation for people whose lives are often reduced to mere survival. How can experiences like Verdragon help rethink theories and practices within the broader climate movement?

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Keywords: Social movements, decolonial ecology, climate change, community-based initiatives, Eco-Marxism

1. *Introduction*

Colonialism, racism and the expropriation of natural resources are the foundations on which the capitalist system is built.[1] It seems obvious to say – we've heard it many times during conferences, assemblies, demonstrations, and we sometimes think to act accordingly in our daily activist work within our territories in struggle. Nevertheless, I am almost sure that when we heard it and thought to practise accordingly, we were immersed in a white crowd. In this paper, I do not wish to give a lesson nor to wade into issues of liberal representation politics, but rather to reflect and formulate useful questions for a suffering climate movement.

2. *Context*

The incredibly valuable analyses of Ecofeminism, Eco-Marxism, Black Marxism and decolonial scholars and movements have laid the groundwork to understand the functioning of the capitalist system, broadly understood as a social order, closely interdependent with other systems of oppression, such as colonialism and patriarchy.[2]

As illustrated by Fraser,[3] the creation and dependence on dichotomies – nature/society, white/non-white, Christian/non-Christian, production/social reproduction, etc. – is a fundamental element of the system. Nature, racialised and non-Christian populations, together with social reproduction, are "Others" and othered, thus they can and must be appropriated and exploited. Dichotomies allow and justify the appropriation of the resources these Others generate, giving substance to primitive accumulation, the "origin story" of the capitalist system, and to the, since then, continuous processes of dispossession and appropriation which keep it alive. Dichotomies constitute the ontological and epistemological foundations of the capitalist system. In particular, the epistemological institutions of white supremacy enable the expropriation of the lives of racialised people and their natural resources through slavery and colonialism. In turn, these are the mechanisms underpinning the "classical" exploitation of labour by capital.

[1] Fraser 2022; Rodney 2018.
[2] Davis 2011; Federici 2004.
[3] Davis 2011.

How does this translate into practical terms? For example, this emerges in the genocide and epistemicide of peoples in South America, perpetrated with the aim of appropriating the natural resources necessary for the functioning of mercantile capitalism, allowed and justified by the documents written by Grotius, amicably considered in Western universities as the father of international law.[4] Davis clearly outlined how slavery in the Southern states of the US kept alive the industrial economy of the North, where workers of all colours and genders were exploited, while laying the ground for the climate disaster of the following centuries.[5]

Today, dynamics of colonialism and modern slavery persist, as seen in the "post-colonial" politics of France in West African countries, especially regarding financial and monetary policies[6] or in the new forms of slavery and "caporalato", unfolding in the Italian countryside, where migrant workers are exploited, living in unspeakable conditions to grow the vegetables we eat.[7] Moreover, the exploitation of labour, in terms of working conditions and salaries, also follows the colour line, blending with the class line, although remaining distinct. In Venice, where I live and struggle, I only need to go out my door into the first hotel or BnB, to see the migrant women who are cleaning the rooms, or the migrant men who are employed in restaurant kitchens, invisible to our eyes, taking up precarious jobs, often within the black economy, without rights and benefits. In our cities, class and race interact, generating new forms of exploitation. Indeed, now most of "the poor", who populate the peripheries, and who take up the jobs reserved for poor and marginalised people, are black and brown people. Furthermore, within European countries, environmental racism affects the lives of racialised people, who are the most exposed to environmental hazards, while having limited access to ecosystem services.[8] Who lives in the most polluted neighbourhoods?

However, as many have pointed out, from Marx himself, to O'Connor,[9] Malm,[10] and Robinson,[11] capitalism is a highly unstable system. It is characterised by cyclical and structural crises caused by its own

[4] Peoples' Platform Europe 2025b.
[5] Davis 2011.
[6] Pigeaud & Sylla 2024.
[7] De Martino et al. 2016.
[8] Nixon 2011; Williams 2022.
[9] O'Connor 1988.
[10] Malm 2020.
[11] Robinson 2025.

functioning, crises of overproduction, gigantic financial cracks and debt crises. These crises have been faced with different systemic adjustments, which have brought the system to completely restructure itself, always at the expense of the previously mentioned Others. This was the case of the Structural Adjustments Programs (SAPs), part of the neoliberal reforms following the global political turmoil of the 70s. SAPs sparked crises in food security and malnutrition in the so-called Global South, due to the crowding out of subsistence agriculture in favour of large estates for cash crops cultivation, and the high indebtedness of farmers.[12] Nevertheless, we are currently living through the writing of a new chapter of capitalist deep crisis, a systemic one, where the system has exhausted the ways through which it can restructure itself to maintain its functioning. Thus, a new kind of fascism and the configuration of a global war regime are desperate attempts to maintain the capitalist precarious status quo. War and genocide become ordinary systemic tools to govern the multiple, interconnected economic, ecological, political, and social reproductive crises. The state makes a grotesque comeback in an authoritarian, militarised guise, an empty shell that violently enforces the interests of a limited group of billionaires upon societies. Peaks of police violence against young racialised populations,[13] institutionalised racial profiling brought about by the establishment of "Red Zones" in Italy,[14] the externalisation of borders in Albania and the strengthening of the institutes of administrative detention as a model for European migration policies.[15] These are only a few of the ways in which racialised people are being butchered by states and intergovernmental institutions in an attempt to maintain the status quo. Not to mention how mitigation and adaptation to climate change are slowly but inexorably disappearing from the political agenda, as leaders demonstrate disinterest even for greenwashing, leaving the ground to the evermore explicit arms race, at the expense of people and ecosystems, normalising genocide and ecocide, as seen in Palestine and many other territories.[16]

In this context, now more than ever, we need to recognise that anticapitalist struggles for radical ecological transformation need to be antiracist and anti/decolonial.

[12] Federici 2019.
[13] Le Monde 2020; Maggioni 2024.
[14] Ferri, & Firouzi Tabar 2025.
[15] Ferri 2025.
[16] Robinson 2025.

3. *Experiences*

The climate movement in Europe is a disproportionately white movement. To notice this tendency, we just need to look at demonstration crowds, assemblies, spokespeople, etc. Despite its different forms, organisations, compositions, practices, and despite all the claims for decoloniality and the attempts to broaden the discourse to acknowledge the relevance of colonialism in the structure of capitalism, it has shown a general difficulty in engaging with racialised subjects in a massified way.[17] It is particularly visible in countries where non-white people are a significant part of the population, such as France. Again, this is not an issue of liberal representation politics, where diversity is pursued for its own sake, for people to partake equally in the structures of capitalist violence. Identity politics are constantly weaponised by companies, states, and the like to co-opt mass social movements and maintain a status quo of oppression – just painted pink, black, or rainbow. This paper attempts to unpack the ways in which, while seeking justice and liberation, we might still be reproducing mechanisms of prejudice, discrimination, oppression, and, in some cases, violence. However, it is fundamental to keep in mind that no person, organisation, or movement will ever be perfect. As people who mobilise for social and ecological justice and liberation[18] in European contexts, we have a radical need to build together the tools to see and listen, if we want to create solid foundations for the alliances we need to finally win.

A well-rooted prejudice is that black and brown people in Europe are unaware of the ecological destruction happening in the territories they live in, the pollution and suffocation they are being subjected to, more than other parts of the population. But this is not necessarily true. It is rather a cognitive bias that leads us to only interact with racialised people when talking and acting upon migration or racism issues, taking for granted that ecology is not their concern. Several factors may explain this tendency; one is that racialised people are actively dis-anchored from the land they live in by racist institutions. They are considered as "migrants" even if they have lived in the same

[17] Ouassak 2024.

[18] When "we" and "us" forms are used in this paper, this is whom I refer to.

place for decades, or even generations. They are made landless, as they do not belong to Europe, nor to the places they may or may not be coming from.[19]

Racialised people in Europe, when not actively discriminated against, or targeted by police and institutional violence, are often only considered as victims to be saved. This white saviourist attitude leads us to consider only their survival and basic needs, such as shelter and food. Nevertheless, although in many cases these are fundamental, black and brown people should also be considered as political subjects with agency. They are people with ideas and opinions about politics, environmental and social issues, and the reality they live everyday – although they are often treated as if they were not. Racialised people may be politicised already, and may already be organised. For example, diaspora communities are often very well rooted within their territories, having developed bureaucratic, legal and other forms of support, organising events and political activities, often in connection with countries of origin and other communities.[20]

Are there antiracist ecology experiences that can teach us something about how we can start doing this? In her book "For a pirate ecology: We will be free", Fatima Ouassak describes the context of oppression faced especially by young racialised people in France, and uses the example of the first House for popular ecology, Verdragon in Bagnolet in Paris' periphery, to reflect on pathways to alliance building and liberation.[21]

Verdragon was born in 2021 out of the collaboration between the parents' union Front des Mères (FDM) and the environmental organisation Alternatiba. FDM has been active in the territory since 2016, organising parents against discrimination and violence faced by their kids, from racial profiling and police aggression to discrimination at school. With its activity, FDM gathered support and legitimacy in the community, forming an alliance with Alternatiba and building a balance of forces with local institutions that made the obtainment of a physical space possible. This was the genesis of Verdragon, which since

[19] Anzaldúa 1987; Ouassak 2024.

[20] Koinova 2012.

[21] The elaboration of this paper is a result of reflections based on Ouassak's arguments presented in "For a pirate ecology" and conversations had with the author during a public presentation of the book at Laboratorio Occupato Morion in Venice, on October 24th, 2024.

then has organised talks, debates and assemblies, free activities for kids, collaborations with organic farmers to make healthy food more accessible, communal school drop-offs and many other activities.

The experience of Verdragon in Bagnolet opens the possibility for people, and especially young folks living in the neighbourhood, to claim their right to political agency, liberation and beauty.

According to Ouassak, fundamental elements for building an anti-racist ecology are the reappropriation of the land and the right to welcoming, to heal the wounds of dis-anchoring, together with claiming freedom of movement for all, to jam the colonial mechanisms of expulsion and the nationalist pursuits of the pure, white state. In Verdragon, the Bagnolet community found a land where they laid the ground for practising re-anchoring, building community, rooting belonging and opening the horizon to claim back political power and agency. This experience breaks the clichés of black and brown people being disinterested in politics and environmental politics in particular. It overcomes the assumption that black and brown people are victims without agency, whose only concerns are strictly linked to survival. In Verdragon, banlieue communities claimed back their right to fight, and to define the terms of their own liberation.

4. *What future for the climate movement?*

It is obvious to most of us that we are far from the oceanic demonstrations of Fridays for Future in 2018 and 2019, where young people from countries in Europe and around the world reclaimed their right to imagine a future for themselves, for the Earth and its human and non-human inhabitants. After the pandemic, the surge of the extreme right is crushing even the most greenwashed of climate-change policies, while repression is weaponised to shatter what is left of the climate movement and ecological resistance around the world. However, in a recent speech at the People's Platform of Europe in Vienna, John Holloway summarised well the sentiments of the present time, dystopian but also full of opportunity.[22] He highlighted the difference between despair and desperation, the first characterised by feelings of anger, grief and sadness, but also resignation. On the other side,

[22] Peoples' Platform Europe 2025a.

desperation postulates the refusal to accept an unjust status quo, thus making anger, grief and sadness powerful tools for transformation. However, for these tools to be effective, they must be organised.

Thus, I conclude this paper by asking some questions, interrogating the ways in which we can reimagine climate and ecological resistance in our territories and globally, taking inspiration from experiences such as Verdragon, recognising the importance of an antiracist approach and nurturing key alliances.

Who is fighting for ecological transformation?

Who can our allies be?

What types of alliances can we build to advance in our struggles?

How will they change us, and what principles are non-negotiable?

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Needs as a tool for socio-ecological transformation

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Abstract

Needs have long been an important word in radical and socialist ideas and rhetoric. A noteworthy example is the Marxian maxim "From each according to his ability, to each according to his needs". In the context of ecological collapse, the debate on needs has received new attention for topics such as the rights of future generations and the management of scarcity. The aim of this paper is to compare the role that needs play in the proposals of Ian Gough, on one hand, and, on the other hand, Cédric Durand and Razmig Keucheyan. The strengths and weaknesses of both strategies will be highlighted. The author believes that a work on these authors could provide a theoretical foundation for socialist policies.

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Keywords: human needs, planning, socialism, political ecology, anticapitalism

1. *Introduction*

Needs have always enjoyed a great role in socialist doctrines, programmes and rhetoric.

For Karl Marx, in his 1875 *Critique of the Gotha Programme*,[1] communist society in its higher phase will inscribe in its banner the maxim: *From each according to his ability, to each according to his needs.*

[1] See Part I of Marx 1999.

For the Russian anarcho-communist Kropotkin, in his 1892 *The Conquest of Bread*,[2] the people in an anarcho-communist society "will lay the foundations of the only economic science worthy the name – a science which might be called *The Study of the Needs of Humanity, and of the Economic Means to satisfy them*." He also writes: "Let us observe that if the needs of the individual are our starting-point, we cannot fail to reach Communism, an organization which enables us to satisfy all needs in the most thorough and economical way".

Communist parties, in power or in opposition, continue to declare communism as their goal, considered as a society governed by the Marxian maxim quoted above. Some of them lead (or led) command economies, so called really existing (or existed) socialism, where only a part of the national product is distributed according to need, however they officially proclaim (or proclaimed) communism in its higher phase as their goal. Famously, the program adopted by the Communist Party of the Soviet Union in 1961 saw communism as foreseeable goal, but it was postponed afterwards.

In welfare State capitalism, whose rise and development was influenced by communist, socialist and social democratic parties alongside parties from other political traditions, the State collects taxes and charges from each according to his economic output and distributes the revenues in money or in services to each according partially to his needs.[3] Whereas the Labour Party was instrumental in the creation of the British welfare State and the Social Democratic Party in the creation of the Swedish welfare State, in France the Communist Party, via Ambroise Croizat, minister of Labour and of Social security, had an important role in the establishment of the social security system (*Sécurité sociale*), an important part of the French welfare State. Even today, it is not by accident that one can read in the official website of the *Sécurité sociale* that the system "is based on an implicit contract binding all citizens: everyone contributes according to their means and benefits according to their needs", a wording that echoes the Marxian maxim.[4]

[2] See Chapter 14 of Kropotkin 2009.

[3] Where the welfare State is partially or totally based on compulsory insurance the person must prove the state of need to obtain the benefit, but the quantity of the benefit (pension, unemployment benefit..) usually depends, at least in part, on the quantity of past contributions.

[4] See Sécurité Sociale 2025.

The concept of *needs* continues to appear in contemporary socialist rhetoric: I will just bring two examples. The declaration of the small *New Anticapitalist Party* in the 2022 French presidential elections proclaimed: "We want to break with the laws of the market, to organize the economy to satisfy the needs of the population" in a democratic way because now "economic choices are dictated by the search for profits".[5] If we look at the website of the Democratic Socialists of America, the largest socialist organization in the United States, we can read: "We believe that working people should run both the economy and society democratically to meet human needs, not to make profits for a few".[6]

The two socialist organizations seem to agree that the profit motive is not adequate for the meeting of human needs, while needs can be aptly and democratically satisfied by a socialist system.

However these and other parties do not go in detail to explain what they mean by human needs: In fact, I think that there is significant gap between the large space that the concept of needs enjoys in socialist rhetoric and lack of study by socialists on the concept of needs: what needs really are and how a democratic polity can define the needs and the ways to satisfy them.

However, there are notable exceptions: among the works on needs, those by Ian Gough, in some cases with the collaboration of Len Doyal, and the ones by Cédric Durand and Razmig Keucheyan are particularly relevant.

The aim of this paper is to compare and contrast the role that needs play in the proposals of Ian Gough, on one hand, and, on the other hand, of Durand and Keucheyan: the strengths and weaknesses of both strategies will be highlighted.

I think that a work on these authors could provide a theoretical foundation for socialist policies: in the context of ecological collapse, that focus on needs is now more important than ever, for challenges like the rights of future generations and the management of scarcity.

[5] See Poutou 2022.
[6] See Democratic Socialists of America 2025.

2. *The theory of Gough and Doyal*

Gough and Doyal's central contribution is to move anchor the discussion on need to a universally verifiable goal: successful participation in some form of social life. They argue that since human beings pursue all their goals, including their vision of the good, on the basis of participation, successful social participation in some form of social life is the most basic human interest.

A "need" is thus defined as a particular category of goals which are universalisable. Crucially, an impediment to successful social participation is classified as a serious harm. This logic leads directly to their fundamental conclusion: basic needs are the universal preconditions for effective participation in any form of social life, and if these needs are not satisfied, a serious harm will inevitably result.

3. *The basic needs: health and autonomy*

Based on the core interest of participation, Gough and Doyal (hereafter, G&D) identify two universal basic needs: health and autonomy.

Health, in this context, is the capacity to survive and function at a basic level, while autonomy is the capacity to make informed choices about what should be done and how to achieve it. These two needs form an objective standard against which all societies can be judged.

To bridge the gap between these abstract universal needs and concrete action, they introduce intermediate needs. These are defined as the universal characteristics of culturally specific need satisfiers: the specific goods, services, and activities that enhance health and autonomy in all cultures (e.g., adequate nutrition, protective housing, safety). The intermediate needs provide a standard by reference to which levels of deprivation within particular groupings can be charted and specific welfare strategies can be defended.

G&D make a list of intermediate needs: adequate nutritional food and water; adequate protective housing; non-hazardous work environment; non-hazardous physical environment; appropriate health care; security in childhood; significant primary relationships; physical security; economic security; safe birth control and child-bearing; basic and cross-cultural education.

To ensure these needs are met, G&D also stipulate essential societal preconditions for need satisfaction. They are:

a) social preconditions (production, reproduction, culture/communication, and political authority);

b) essential prerequisites for autonomy and need satisfaction (positive and negative rights and political participation).

The theory of human needs put forth by G&D is built upon a crucial distinction: while basic needs (health and autonomy) and intermediate needs are universal, the specific means through which these needs are met, termed need satisfiers, vary significantly across time, space, and cultures. This approach establishes that the primary objective of any society must be to achieve the optimum level of basic need satisfaction according to the available knowledge and without depriving the future generations of the possibility to satisfy their needs.

To effectively achieve this, the identification of intermediate needs and their specific satisfiers in any given context requires the integration of two forms of knowledge. It is essential to combine the codified knowledge of experts (scientific, medical, or economic expertise) with the practical knowledge of common people (cultural understanding, lived experience). Only through this synthesis can the most appropriate and effective mechanisms for need satisfaction be identified.

In terms of measurement, the theory defines a clear optimum level as the threshold for basic need satisfaction. Consequently, for each intermediate need (such as protective housing or appropriate healthcare), the threshold is not an arbitrary maximum, but rather the minimum quantity and quality of intermediate need satisfaction required to efficiently produce the desired outcome: the optimum level of basic need satisfaction.

4. *Ethical Foundations and Planetary Boundaries*

A core element of the G&D theory is the distinction between needs and wants, desires or preferences, as considered by neoclassical economics. Unlike wants, which are seen as subjective, adaptive, and shaped by institutions, human needs are considered objective, non-substitutable, and satiable. Conversely, wants are not satiable.

This objectivity, along with the fact that needs are cross-generational, grants them an ethical grounding that wants do not possess. This implies a moral hierarchy: human needs, present and future, trump present (and future) preferences. Consequently, the right to the satisfaction of needs is an ethical imperative concerning every hu-

man being, both present and future. Human needs must be defined as those levels of health and autonomy which are generalizable to all people in all societies, given present levels of resources.

The universality of needs poses significant normative challenges. G&D think that humanity should strive to optimize need-satisfaction on a worldwide scale: this goal ultimately entails some system of global authority to enforce global rights to need-satisfaction, theoretically a democratic world government.

Crucially, human development is about meeting the needs of everyone on the planet today without preventing future generations from doing the same, respecting planetary boundaries and resources. All economic systems, actual or proposed, must therefore be assessed according to their ability to identify and reproduce enough need satisfiers in a sustainable manner[7]. It is possible to construe metrics to assess need satisfaction for groups of people.

The theory does not say how to arbitrate between needs but recognizes a pragmatic reality: "[i]f, due to past industrialism, population growth and environmental degradation, we can achieve less than optimal generalizable satisfaction of basic needs, then so be it": a historically constrained optimum would be the choice.[8]

5. *The Economic Model for Sufficiency*

Gough, in the 1991book co-authored with Doyal, writes that the democratic welfare capitalism, exemplified by the Swedish model, is the best model available for the satisfaction of human needs.[9] However, especially due to the climate crisis, Gough now claims that a more radical reorganization of the economy is necessary: humanity should aim toward a post-capitalist and post-growth world of steady-state economy.[10]

[7] If one considers actual economic systems (for example, Nordic welfare State) one can assess them in theory and practice. For systems that do not have a reference in reality (for examples, anarcho-communism) one can only judge it through a thought experiment.

[8] One could add, as I have shown, it seems that for Doyal and Gough the definition of "optimality" should include what is now materially possible and the rights of future generations. See Gough 2000, p. 12.

[9] See Doyal &Gough 1991, p. 295.

[10] See Gough 2017, pp. 208-209.

In a recent article,[11] Gough specifically proposes to segment economic activity into three distinct sectors to guarantee sufficiency:

1) essential production for needs, this production concerns the satisfaction of needs and should work through public owned or public controlled industries via the policy of universal basic services;

2) in-between economy for wants: this sector deals with wants and works through decentralized markets, but it should be regulated to prevent conflict with essential provisioning;

3) excess economy, this sector, encompassing luxuries, finance, and military expenditure, is considered detrimental for needs satisfaction and therefore has to be shrunk.

This approach aims to ensure that the objective requirements for human well-being (needs) are prioritized and guaranteed before allowing for the variable, subjective pursuits of desire (wants), and eliminating activity that actively detracts from both present and future global need satisfaction.

6. *The Ecological Planning of Durand and Keucheyan*

The work of Cédric Durand and Razmig Keucheyan (hereafter, D&K) provides a critical framework that bridges the philosophy of human needs with the urgent necessity of ecological transition. Their core thesis is that the world of industrial, productivist and consumerist capitalism is fundamentally incompatible with the preservation of liveable ecosystems for humans. The solution they propose is a transition to a post-capitalist, post-growth and ecosocialist world, based on ecological planning.

Their main book is C*omment bifurquer. Les principes de la planification écologique* (2024).[12] It is based on previous works that they wrote separately from each other sometimes with other scholars[13] and of an issue *Actuel Marx* that they co-edited in 2019.

7. *The Social Definition of Needs*

D&K's analysis is informed by scholars like A. Heller, A. Gorz, M. Husson, and O. Neurath, who are critical of how capitalism functions.

[11] Bärnthaler & Gough 2023.

[12] I will draw mainly from the Part II of this book to reconstruct their contribution.

[13] Keucheyan 2019; Keucheyan 2020; Durand, Hofferberth & Schmelzer 2024.

They adopt a nuanced perspective on the nature of human needs. Since they say that some needs are transhistorical (like eating) and others evolutionary (like accessing social networks), they contend that needs are similar to desires and the distinction is fluid. It would be then futile to claim a clear, rigid boundary: desires can sometimes transform into needs (e.g., the desire to travel), and a need can become essential over time (e.g., electricity). The need is satiable, and often, the desire is as well, but not always.

They say that, because of the environmental crisis, we live in the historical period where needs must become the subject of democratic deliberation. This necessitates a collective process to answer the fundamental question: *what are our real needs?*

8. *Principles of Sufficiency and Limitation*

The necessity of ecological planning is driven by ecological constraints. Given the limits of ecosystems, certain needs can no longer be met because they are ecologically harmful. Determining which needs are likely to be met must result from a combination of scientific knowledge about the ecosystem and democracy.

Capitalism constantly generates artificial needs that are both alienated and unsustainable, meaning they are externally imposed and often environmentally destructive. This system operates by producing and proliferating these artificial needs.

Consequently, a crucial step toward ecological planning is a societal process of sorting out what are artificial needs to determine what are real needs.

The answer to the question of who defines these true needs, as opposed to artificial needs, lies, in nearly all cases, in the primary person concerned: the one who experiences the needs.

His answer should be based upon two principles. A real need is a need defined as real by the individual, provided that its satisfaction is compatible with:

a) a sustainability principle, the satisfaction of needs must respect the equilibria of the Earth system as determined by science;

b) an equality principle, every individual can satisfy it if he wants to.

In any case, D&K believe that there is pre-established universal set of material commodities. While acknowledging that there is a decent living standard underpinned by universal human needs[14] D&K stress that if any need or satisfier is not sustainable from an ecological standpoint in its most polluting forms, it is not universalisable. In such cases, the principles of sustainability and equality prevail with one crucial implication: one must either give up the need, or think about another way to fulfil it (another satisfier), one that is less costly from an ecological point of view.

Theres is an apparent contradiction in the work of D&K since sometimes it seems that needs should be defined at the individual level, but they also say that the elaboration of the economic plan should begin within instances of deliberative democracies called to answer the question *what are our real needs?* and that the planning they advocate involves a "politically defined prioritisation of needs"[15] and Keucheyan writes: "Except for a small number of vital needs such as eating, breathing, or sleeping, there is no such thing as a 'real' need defined in absolute terms. A 'real' need is one that a society considers as such at a given time in its history".[16]

I think that D&K are ultimately calling for a collective deliberation about needs and need satisfiers, marking a break from the consumerist logic and trying at the same time to protect individual autonomy.

They outline a model of green economic planning based on a federal democracy: they think that a lot can be learned from developmentalist models of the twentieth (France, South Korea) and twenty-first (China) centuries, which however can only be a partial inspiration: they have growth as their goal and sometimes are not democratic.[17]

9. *Conclusion*

There are many points of convergence between Gough and D&K. I would like to mention the criticism of command economies as dictatorship over needs and of capitalism because his anti-ecological outcomes and his inadequacy on the satisfaction of human needs, the

[14] For examples, refrigeration is now a standard for the transhistorical need of nourishment .Durand & Keucheyan 2024, p. 74.

[15] Durand & Keucheyan 2024, p. 41.

[16] Keucheyan 2021, p. 144.

[17] See Part IV of Durand & Keucheyan 2024.

proposal for a democratic post-growth and post-capitalist society, and the promotion of the combination of participative democracy and expert knowledge.

However, there are at least three important differences.

D&K argue (it seems) for a planning that is comprehensive for the whole economy, whereas Gough thinks that a decentralized market sector, aimed at the satisfaction of wants, although regulated, should be maintained.

The distinction between need and need-satisfier is crucial for Gough, while D&K sometimes make this distinction, but not always. In fact, if one has in mind this distinction as outlined by Gough, electricity, refrigeration and social networks should be seen as need-satisfiers, not as needs.

D&K make a loose distinction between needs and wants and a sharp distinction between real needs and artificial needs, while in Gough the first distinction is sharp and crucial, and the second distinction is absent[18].

I think that Gough's terminology should be adopted since it is more accurate and robust: in his framework, what D&K call artificial needs can be called pseudo need-satisfiers, that should be substituted for adequate and true need satisfiers, and harmful wants, that have to be limited or shrinked.

Moreover, I would say that Gough and D&K (if my interpretation is correct) are right when they think that the definition of needs and need satisfiers should be a collective choice and that the two principles outlined by D&K should apply to what Gough calls need satisfiers, but is to be discussed if they can apply also to wants and want satisfiers and what role can the market play in a post-capitalist economy.

What I have presented is only the preliminary work for the development of a coherent framework that integrates the strengths the works by Gough and those by Durand and Keucheyan.

In conclusion, I would like to say that, since a world in which every human has the real opportunity to meet his decent living stand-

[18] However Gough says: "Some wants can be excessive or harmful – what Max-Neef refers to as 'violators' or 'pseudo need-satisfiers.'" Gough 2020, p. 217.

ards is now possible[19] event though it may me not be possible in the near future if catastrophes are not averted (generalized war, ecological breakdown…), there is the necessity to provide theorical foundations and tools for a strategy that works towards this goal:[20] I think that the concept of *need* will play an important role in this task.

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[19] Cfr. Rao & Min 2018; Millward-Hopkins, Steinberger, Rao, & Oswald 2020.

[20] Cfr. what writes Engels in Part III of his 1880 *Socialism: Utopian and Scientific*: "The possibility of securing for every member of society, by means of socialized production, an existence not only fully sufficient materially, and becoming day-by-day more full, but an existence guaranteeing to all the free development and exercise of their physical and mental faculties – this possibility is now, for the first time, here, but *it is here*" (Engels 2003). While it is now true that *an existence fully sufficient materially* is possible for everyone, it is debatable if also the second part of what Engels wrote applies today.

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Scrooge Meets Marx: Nature Conservation and the Guatemalan Fir's Use Value

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Abstract

This paper builds on the case of *Abies guatemalensis* Rehder, an endemic fir in Guatemala whose endangered status lies at the intersection between a fortress-leaned conservation policy and context-specific rural livelihoods strategies. I used a mixed bag of methods including field-based surveys, in-depth and questionnaire-based interviews, and participant observation over two decades of interactions with this species and its users. In summoning Scrooge and Marx, I aim to elucidate the discursive extent of a use-value-centred rationale among small-scale fir cultivators in the western highlands of Guatemala, explore a grassroots-based and counterhegemonic fir conservation strategy coming about among them, and inform on how this case sheds light on a vernacular stream of eco-Marxist thought. I found a context-based rationale for replacing exchange by metabolic value as a way to avoid further fetishisation of an otherwise emblematic tree. The pedestal upon which the idea of a pristine nature is predicated stems from a fetishism around the notion of ecological viability, i.e., that to guarantee life, humans need to be purposefully evicted from biodiversity-rich areas thus paving the way for exchange value derived from ecosystem goods and services. Local small-scale forestry strategies, alternatively, are more aligned with a use-value-centred rationale for guaranteeing ecological viability. These findings dovetail with the notion of a critical natural science and pave the way for a revamped notion of nature conservation among marginalized ontologies and neglected epistemologies.

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Keywords: Convivial conservation, Guatemalan fir, metabolic value, small-scale forestry, use value

1. *Introduction*

This paper is intended to provide some context-based insight on what a subaltern critical natural science might look like. I stand at the enunciation locus of a full-time professor at the public university in Guatemala, which means that this contribution went through the lens of how academic work comes about in a peripheral context. I also depart from a background on natural resource management and ecology with a deep-seated concern for the emancipatory potential of science and higher education. I shall share my findings after several interactions with the fir-related community in western Guatemala including my fieldwork as a PhD student between 2004 and 2007 and more recent encounters in 2022-2024 with fir cultivators and fir-seed collectors. In what follows, I address the general characteristics of my area of interest, the methodological approach used , the main findings nuanced around how metabolic values might prevent fir use from merely fuelling business-as-usual exchange-value circuits under capitalism, and some thoughts on the counterhegemonic ways to go about nature conservation and use found during my fieldwork. I aim to address three questions, namely: (i) what is the extent of a use-value-centred rationale found among small-scale fir cultivators in the western highlands of Guatemala?; (ii) how does a grassroots-based fir conservation strategy come about among local residents of this region and what counterpoints can be elicited from their praxis when contrasted with hegemonic nature conservation narratives in the country?; and (iii) how does this case inform a vernacular stream of eco-Marxist thought in the discourse, beliefs and practices of small-scale fir cultivators?

2. *Setting and methods*

Guatemala lies at the northernmost corner of Central America, an isthmus whose emergence from the sea finished 3 million years ago thus providing a land passage between North and South America.[1] This late appearance is the reason why this swath of land got populated by both northern and southern plant- and animal-species. The oldest human settlements seem to have arrived roundabout 25 thousand years ago.[2] Such a diversity found ideal conditions in Guatemala given its high level of landscape diversity with a lowland dominant ecosystem across the southern shoreline, a piedmont with abrupt altitude changes and habitat conditions, the highlands, and the northern lowlands harbouring the second largest rainforest in the continent. This research journey took place across the western highlands (Figure 1), a landscape dominated by temperate-like forest ecosystems where oaks, pines and – at higher altitudes – firs are common sights. This region also harbours a significant level of cultural diversity given the co-existence of three ethnic groups, namely the *Mam*, the *Quiché* and the *Ladino* peoples, the latter being the mixed-raced descendants of pre-Columbian natives to this region and the Spaniards that began arriving in these territories as of 1524. I focus on a fir species (*Abies guatemalensis* Rehder) locally known as *pinabete* or *pachac* still found in relict stands across the region. My involvement with the species began back in 2004 when I started off my PhD fieldwork looking at both ecological and socioeconomic dynamics vis-à-vis the conservation status of such a charismatic tree. My project was aimed at describing the enabling conditions for a conservation-by-cultivation strategy which would arguably reduce anthropogenic pressures on these relict stands while increasing rural incomes for those families living below the poverty line in these areas. After three years of fieldwork involving a quarterly 149-household interviewing effort over a 1-year period, data cleaning, statistical analyses, and the publication of results in peer-reviewed journal articles,[3] I somehow veered away from the subject until 2022 when I accepted to get back to the same region on a different assignment. My university was hired to conduct consultancy

[1] Briggs 1994; Castañeda Salguero 2017.
[2] Raff & Bolnick 2014.
[3] Prado Córdova *et. al.* 2013; Angelsen *et. al.* 2014.

work to assess the genetic viability of *A. guatemalensis* populations and explore whether a seed commercialization strategy was feasible considering conservation concerns. This time around, I was part of a research team conducing in-depth interviews with both local officials (n=2) and fir-seed users (n=34) across six townships in the western highlands.[4] In 2024, I was invited by the Institute of Forests – Inab – and by the National Council for Protected Areas – Conap – to deliver the keynote speeches at two regional conferences where I had the chance to test the waters on the current conservation-related strategies being implemented for this species and thus compared notes with colleagues and foresters working in the western highlands. In sum, my methods stem from a scholarly, urban, middleclass positionality from which I've interacted with those preserving, using and making plans for the Guatemalan fir by means of in-depth interviews and participant observation, field visits and literature review.[5]

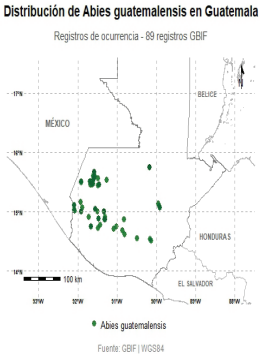

Figure 1. Natural distribution of Abies guatemalensis Rehder in Guatemala (Global Biodiversity Information Facility, 2025). Map made with R version 4.2.1 © (R Core Team, 2022) and the assistance of LLMs to refine coding.

[4] Prado *et. al.*, under review,.
[5] King 2000; Russell 2006; Cortés *et. al.* 2019.

3. *Deriving metabolic value from use-value in a fir-dominant landscape*

I contend that the mainstream notion of economic value falls short of a firmly rooted biophysical dimension. Forest products, for example, are certainly part and parcel of a use-value-driven rural economy across the Global South but their organic articulation to ecological viability, i.e. their metabolic value, tends to get sidelined by mainstream efforts to quantify forest income and forest-based livelihood strategies.[6] Ecosystems create metabolic value which, in turn, tends to reduce entropy given its relational, immanent and emerging nature and thus conceptually addressing ecological integrity while factoring in humans and, in particular, reproductive labour.[7] Use-values are often to be found in subsistence-oriented socioecological systems whose domestic trading strategies certainly transcend households' basic needs thus creating ephemeral exchange-value, as it were, but – when done within the confines of locally determined ecological thresholds – extending metabolic value by an explicit constrain on abstract labour and wealth accumulation on its own right. The conceptual boundary between a meaningful metabolic value and capitalist accumulation is the accumulation regime, i.e. "the set of regularities that ensure the general and relatively coherent progress of capital accumulation".[8] An extended metabolic value, as it were, precludes capital-driven accumulation insofar as ecological boundaries – and not profit – are the limits to economic exchange. Critical voices such as that of Hornborg stating that "nature has no use for money"[9] are meant to signal the shortcomings of a theory of value arguably insufficient to account for nature's being underpaid under capitalism. A metabolic-value approach, however, might fill in the gap between an energy-based account of environmental degradation and the contemporary capital-driven ecological crisis by extending a value-centred rationale where use- and exchange-value are no longer the only wealth-making devices. This analytical move could be conceptualised as adding a third wheel to a non-identitarian dichotomy involving use- and exchange-value. If use-value entails the non-profitable and thereby

[6] Angelsen *et. al.* 2014.

[7] Salleh 2010; James & Broome 2023.

[8] Boyer & Saillard 2002, p. 34, as cited in Cahen-Fourot & Magalhaes 2023, p. 3.

[9] Hornborg 2016, p. 10.

less-prone-to-reification vector in nature appropriation, exchange-value means the opposite, i.e. the very source of capital accumulation being achieved in the commodity fetishism. Use-values, this argument suggests, entail a double meaning in accordance with Castree, i.e. "qualitatively specific entities designed to be of practical or symbolic utility".[10] The intangible dimension of use-values accounts then for an ingrained mechanism that allows sociability to survive vis-à-vis the specific traits of local cultures and social metabolisms.[11] In the end, we are dealing with the intersection of material needs and a symbolic-based strategy for value creation in several ways.

Christmas celebrations mirror an ideological platform promoting the idea that capitalism can also accommodate affection and solidarity. Fictional character Ebenezer Scrooge arguably represents the potential for a capital-laden rationale to turn into a humanitarian endeavour. In Charles Dicken's *A Christmas Carol* "Scrooge goes through a personal transformation from an unpleasant, cold-hearted, and selfish misanthropist with a special aversion to Christmas to a generous, loving philanthropist who learns to appreciate the true meaning of the holiday".[12] This unlikely unfolding of events, however, "reveals Dicken's inability – despite his diegetic condemnation of capitalism – to imagine a society in which the marketplace does not define individual personhood".[13] Put differently, what might come across as lack of imagination seems to be an ultimate act of allegiance with the status quo of the time where generosity-driven grand gestures entail the impenetrable boundaries of a capital-led rationality according to which labour might be exceptionally fully compensated but not freed from alienation. The deep-seated capital-driven rationality enacted by selfish Scrooge at the beginning of the narrative is not really overcome by his final act of repentance as far as a capital-laden subjectivity goes. By the same token, even a Christmas celebrated with sustainably produced trees does not automatically translate into a counterhegemonic practice. A fair chance for this demands explicit moves for interrupting the accumulation path from use-value to exchange-value by enabling metabolic value to be created in the process.

[10] Castree 2015, p. 283.
[11] Aguilar 2024.
[12] Mikkonen et. al. 2011, p. 106.
[13] Young 2019, p. 220.

My field-based findings suggest that local small-scale foresters across the western highlands embrace a sense of counterhegemonic notion of nature conservation. They seem to be fully aware of the need to guarantee local ecological viability by making a sustainable use of *A. guatemalensis* but complain about a too stringent legislation allowing tree nurseries without explicitly allowing seed collection.[14] In my interactions with these fir cultivators, I could see that they certainly aim at increasing their income by paving the way for a crystal-clear legislation that helps them know where, how much and how often seed collection activities could be carried out. National authorities, on the other hand, have been conservative about promoting seed collection given the conservation status of the species, i.e., *in danger*.[15]

5. *A deep-seated fetishised notion of wilderness*

Nature conservation has become a Trojan horse for capital accumulation inasmuch as ecosystem goods and services are conceptualized as commodities to be traded and profit overrules biophysical indicators of how neoliberal capitalism destroys species, biogeochemical processes, genes, and ecosystems.[16] When applied to charismatic species, such as the Guatemalan fir, fortress conservation is equivalent to an enclosure of sorts whereby human communities inhabiting the surroundings of relict fir populations get deprived from their access and use rights vis-à-vis the species on the grounds of a conservation ethic more in line with sparsely populated landscapes elsewhere and weakly applicable in densely populated regions like the Guatemalan western highlands. Restricting access to a valuable livelihood resource, in addition, perpetuates a separation between humans and nonhumans. Nature reserves, for example, entail a land-sparing rationale by which pristine areas – ideally half of the planet for some[17] – are to coexist with intensive agriculture in what seems to be a major contradiction if one factors in the environmental damage caused by industrial agriculture. Furthermore, strict protection of nature conveys the idea of humans being somehow disconnected from it thus creating a

[14] Prado Córdova et. al., under review.
[15] IUCN 2008.
[16] Allen 2018; Richardson et. al. 2023.
[17] Ellis & Mehrabi 2019; Kothari 2021.

fetishism about ecological viability, i.e. that for ecosystems to thrive, human populations must be evicted from biodiversity-rich areas. This trope has percolated conservation initiatives inspired in colonial practices of encroachment upon Indigenous lands where non-Western ontologies had succeeded for centuries in safeguarding ecological viability while harvesting certain goods in accordance with traditional ecological knowledge.[18] A subaltern conservation biology, as it were, seems to have been steaming underneath mainstream science and policy discourse.

6. *Interrupting capital accumulation with convivial conservation*

Convivial conservation means an ambitious intellectual and practice-based endeavour to problematise mainstream conservation science. It explicitly transcends market-based mechanisms as the hegemonic rationale for addressing nature-conservation challenges while lobbying for a complementarity-based approach vis-à-vis the complex relationship between humans and their natural environments. This approach calls for a shift from protected areas to promoted areas where human presence and sustainable use are encouraged, a discursive shift from saving nature from people to celebrating unity between humans and nonhumans, the need to overcoming tourist voyeurism by long-term engagements with biodiversity, for questioning nature-related spectacularity and rooting for a day-to-day liaison between humans and the natural world, and for turning privatised expert democracy into a devolved kind of governance prioritising Indigenous and community groups. Conviviality, these authors argue, entails "the building of long-lasting, engaging and open-ended relationships with nonhumans and ecologies".[19] It seems to me that this ambitious project offers both a conceptual sounding board and a path worthy of scrutiny from a use-value perspective. A call for halting capital accumulation means an explicit hindrance for the hegemony of exchange-value, thus convivial conservation turns out to be an emancipatory category whose scope and depth seem to be a good fit for both eco-Marxism and a critical theory of nature.[20]

[18] Garnett *et. al.* 2018.
[19] Büscher & Fletcher 2019, p. 286.
[20] Cassegård 2017.

Biodiversity conservation then turns out to be a tipping point, as it were, given its policy leaning.[21] Framing the need to preserve nature within the hegemonic policy rationale means a major concession to a neoliberal ethos and, most importantly, a conceptual battleground vis-à-vis the challenges germane to ecological viability. A critical natural science, however, is expected to pave the way for a dialectics-driven inquiry into the feedback loops perpetuating a juggernaut-like rationale underlying natural resource management and the chances for an engaged ecology. A renovated liberation ecology, my field experience suggests, seems to be already underway and an epistemic device could be strengthened by paying particular attention, in principle, to three aphorisms, namely: (i) ecological viability ought to be understood as a flux coming about in both material and symbolic realms; (ii) biodiversity-related use-values have the potential for spawning metabolic values as opposed to exchange-values thus recovering otherwise capital-accumulation spaces; and (iii) a critical natural science is uniquely positioned to gain political traction stemming from science-based advocacy efforts where praxis ought to entail a merger among rigorous field-based research, awareness rising, citizen engagement, and high-end lobbying.

7. *Living labour in the local knowledge*

Labour in these communities is also spared from capital appropriation with community service schemes such as *kax kol* which can be translated as sacrifice-based service to one's community. In this sense, a parallel could be drawn between surplus-value and the painful sacrifice element germane to community service. Everyone tasked with *kax kol* takes up a time-bound commitment during which personal business gets usually put off. By doing this, the sacrifice materializes through some sort of self-estrangement, as it were, hence its painful nature. The difference, however, as opposed to surplus appropriation by capital is that the fruits of this process of wealth creation are eventually enjoyed by the whole community thus ripping off social wealth otherwise taken by capital in various forms of off-farm employment including international migration. A lobbying effort aimed at regularizing fir-seeds collection also means a locally validated driver

[21] Christoph 2004.

for wealth creation. This wealth, however, might be salvaged from exchange-value by a collective focus on the domestic metabolism, i.e. by privileging metabolic value which means that reproductive labour, for instance, ought to be factored in. In doing so, capital-driven patriarchy gets undermined by the explicit recognition of an otherwise free service historically provided by women and essential for capital accumulation, namely, labour power reproduction.[22]

8. *Negotiating rules and meanings*

My interactions with these fir cultivators suggest the ongoing creation of conservation countervalues, as it were, as far as the main tenets of mainstream conservation science are concerned. A viable population of firs, in this case, is more likely to come about if an among-populations exchange of seeds is not only allowed but promoted thus enabling a richer gene exchange ultimately contributing to a long-term viable population.[23] For this to happen, local producers need to be encouraged to collect seeds and exchange those with peers across the valleys and landscape traits separating the two major populations (Figure 2).

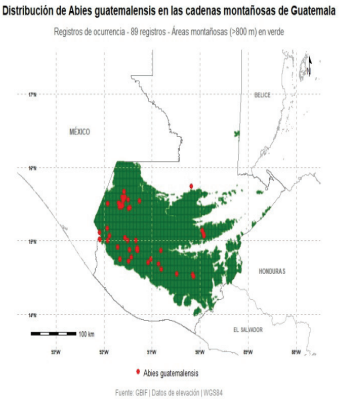

Figure 2. Location of A. guatemalensis on lands at altitudes higher than 800 m asl in green (Global Biodiversity Information Facility, 2025). Map made with R version 4.2.1 © (R Core Team, 2022) and the assistance of LLMs to refine coding.

[22] Salleh 2010; 2024.
[23] Ruiz-Chután *et. al.* 2025.

Achieving ecological viability and preserving a fir species can be relevant goals compatible with a differentiated analytical strategy where human praxis gets applied to a critical understanding of how forests work and what species need to thrive vis-à-vis the anthropogenic pressures in a particularly complex landscape. Rather than a competitive commercialisation strategy for *A. guatemalensis*' seeds – inherently prone to exchange-value circuits –, a domestic trade scheme across the Guatemalan western highlands could well entail a detour from accumulation by deriving metabolic values. This is to say that a strengthened fir-based peasant economy might well lift off some subsistence-driven burden from these households. Conventional science is not the only – let alone the best – way to substantiate context-driven fir conservation strategies. It might offer, however, an honest sounding board for those local knowledges whose empirical findings provide forestry practices with a better chance for achieving sustainability thus contributing to halt an extinction-bound trajectory. Finally, charismatic species do not need to be turned into merchandise for human populations to recognise their intrinsic value. In a subsistence-led economy use-values could certainly be translated into metabolic values also by generating enough income to prevent women, for instance, from a double burden of productive and reproductive labour within their households. For the case of the Guatemalan fir, the women artisans that I interacted with are also rooting for an explicit legal authorization for seed collection so that they can keep up hand-making different sorts of fir-based Christmas ornaments.

9. *Conclusions: Food for eco-Marxist thought*

Indigenous communities are, in many cases, alien to a profit-centred rationale and to the symbolic realm of it, namely Scrooge-like Christmas' redemption. The same goes to non-identitarian dichotomies already overcome within these contexts such as the collectively appropriated surplus-value inherent to *kax kol*. It seems to me that this is achieved despite a subaltern position and with no minor concessions, but it entails a relevant counterpoint for a Western-leaning eco-Marxism.

A conservation-by-cultivation strategy does certainly parallel some aspects of convivial conservation, notably the idea of making use of biological diversity while preserving ecological integrity but

it differs in a crucial aspect, namely that the latter explicitly rejects market-based mechanisms as sound conservation strategies. In doing so, this approach seems to be closer to a vernacular bond – a relational ontology, rather – between rural populations and their natural environments. In this sense, conviviality transcends a sheer utilitarian rationale and embraces both materiality and the symbolic realm within nature appropriation strategies. In sum, the analytical merger, as it were, of convivial conservation and traditional ecological knowledge seems to be a strong foundation for a critical natural science well positioned to fill in the gap left by an overly constructivist approach on the social construction of nature with an empirically based and context-driven approach.

Local fir cultivators across the Guatemalan western highlands have come up with a context-driven advocacy strategy aimed at modifying current legislation so that seed collection gets explicitly allowed. The evidence hitherto collected suggests that the fir use-value is at the centre of their advocacy strategy. They do not seem to be eager to obliterate the relict population of this tree species but to guarantee its long-term viability while including it in their income-generating strategy. In this sense, their conservation strategy seems to be consistent with that stemming from convivial conservation in, at least, four major points: (i) these cultivators root for a promoted area where fir conservation dovetails with a management strategy as the pivot for their livelihood rationality; (ii) they certainly celebrate unity between nature and humans with their praxis and exhibit full awareness of the fragile ecological cycles to be maintained for long-term sustainability to be achieved; (iii) they do keep a day-to-day involvement with nature by tending to ageing forests and preventing poachers and outsiders from collecting branches, firewood and other goods thus contributing to forest conservation; and (iv) they certainly have their say heard before the regional bodies in charge of authorizing local forestry and conservation practices. As for eco-Marxism, this case might shed light on several epistemes being coined in the midst of this dispute over nature conservation meanings. First and foremost, the metabolic value being derived from the use of this fir stems from the symbolic dimension to be found in the strong attachment to their landscape shown by these cultivators. Fir cultivators could play a major role in restoring this population to viable levels by enabling a more fluid seed exchange dynamic across the main landscape divide between the

two major populations. In so doing, their praxis is both testament to and driver for a locally based convivial approach and a counternarrative vis-à-vis the fetishised fortress nature conservation rationale. The symbolic dimension of use-values also spawns an ontological relationship where local residents embrace nature metabolism out of material necessity but also inspired by an organic bond to their territory. They create and re-create metabolic value by avoiding sheer reification when transitioning their firs from use-value to domestic circles of commercialization and barter. Finally, this case seems to serve as a sounding board for the eco-Marxist school of thought prone to accept an essence monism but a property dualism. Nature and humans are both inherently bond together across these territories but also analytically apart from each other providing enough room for a nascent critical natural science to connect the dots between traditional ecological knowledge and engaged research.

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Unequal Exchange in Extractive and Productive Peripheries: Delinking, Degrowth, and Global Eco-Social Transformation

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Abstract

Structuralist dependency theory traced underdevelopment to unequal exchange between a productive Center exporting manufactures and an extractive Periphery exporting primary commodities. It inspired import substitution industrialization in the Periphery, combining trade protectionism and financial liberalization, which proved unsustainable. Neoliberal globalization later fostered two export-led development strategies: free-trade industrialization in Asia, based on global value chains, and neo-extractivism in Latin America and Africa, based on state appropriation of natural rents. The resulting new international division of labor, with the relocation of world manufacturing, has not reduced global inequalities. Drawing on a Marxist approach to unequal exchange, this paper argues for a complementary path of dependency, with ecological plunder and labor exploitation of the global South both rooted in the international law of value. This configures a functional differentiation between an extractive Periphery providing natural resources and a productive Periphery providing labor for monetary accumulation in the Center, rather than an economic upgrading of newly industrialized countries, except China. In this framework, escaping dependency requires delinking from global capitalism for autocentric economic and ecological circular practices and South-South cooperation. This radical alternative intersects with new critical visions facing the global socio-ecological crisis. In the Center, radical environmentalism advocates degrowth for sustainable living. In the Periphery, grassroots movements reject universal com-

modification by drawing on the traditional values of non-Western indigenous cultures. An alliance of traditional and new social movements around the nexus of delinking Global South and degrowing Global North can promote social and environmental justice for an eco-socialist transition.

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Keywords: Dependency, delinking, degrowth, uneven development, unequal exchange

1. *From import-substitution industrialization to export-led growth in the Periphery*

After the Second World War, Raul Prebisch and Hans Singer identified the classical international division of labor between an industrial Center and a primary-producing Periphery as a major cause of disparities in global economic development.[1] Their argument was based on the secular deterioration of the terms of trade for primary commodities relative to manufactured goods. Subsequently, based on the Prebisch-Singer thesis, different export specializations between Center and Periphery of the world economy became a pillar of the Latin American dependency school.[2] In the 1950s and 1960s, this perspective found its most visible policy expression in import-substitution industrialization (ISI), which relied on trade protection to foster a domestic market for infant industries in developing countries. This strategy entailed a politically regulated integration of the Periphery into the global market within a world order shaped by Keynesian-inspired international arrangements. However, the collapse of the Bretton Woods system in the 1970s and the liberalization of private capital flows ultimately rendered the ISI unsustainable.[3]

[1] See: Prebisch 1950; H. Singe 1950, pp. 473-485.
[2] See Dos Santos 1970, pp. 231-236.
[3] See Irwin 2021.

Since the 1980s, neoliberal globalization marked the spread of an outward-looking model codified by the Washington Consensus and supported by the International Monetary Fund and the World Bank through stabilization and structural adjustment programs. Following the neoclassical principle of comparative advantage, it promoted two export-led growth strategies in the Periphery, one based on manufacturing and the other on primary commodities, depending on each country's relative resource endowment.[4] The first strategy is export-led industrialization, adopted by countries with abundant labor and limited primary resources, which aims to expand the export sector by attracting foreign direct investment as a source of capital and modern technology. It has fostered the integration of domestic industry into the global value chains of multinational corporations, relying on low wages in the labor-intensive stages of production.[5] The second strategy is extractivism, which has been adopted by countries with abundant strategic natural resources. Dating back to colonialism, it is based on the intensive appropriation of natural resources to export largely unprocessed primary commodities with low value added.[6] What characterizes contemporary extractivism is the proactive role of the state in exploiting natural resources through a mix of neoliberal reforms and forced expropriation of the commons. A progressive variant is the neo-extractivism of the Pink Tide governments in Latin America, marked by state appropriation of natural rents to finance social policies as a means of income redistribution.[7] A regressive, comprador variant is patrimonial capitalism, found in the Middle East, Africa, and the former Soviet Union, based on the private appropriation of natural rents by the ruling elites.[8] Despite their contrasting political orientations, both strategies rest on a common model of over-exploiting non-renewable resources for large-volume export.

[4] See Ricci 2025, pp. 1-21.
[5] See Gereffi 1995, pp. 100-142.
[6] See Petras & H. Veltmeyer 2014.
[7] See Acosta 2013, pp. 61-86; E. Gudynas 2019, pp. 234-243.
[8] See Schlumberger 2008, pp. 622-649.

2. *Global inequality and unequal exchange in the new international division of labor*

In the 1970s, the thesis of a new international division of labor was proposed to account for different export specialization of peripheral countries[9]. It preserved the Center-Periphery model by redefining the polarization of the world economy as factor-based, with capital- and skill-intensive production in the Center and natural resource- and labor-intensive production in the Periphery. With the spread of global value chains, the Center-Periphery model has been replaced by the thesis of a "newer" international division of labor, which describes the global economy as a mobile space in which countries, regions, and firms upgrade or downgrade according to their organizational power.[10] In this view, global inequality transcends national boundaries and the traditional North-South divide. For this reason, it has been criticized for overlooking the unitary nature and global social class dynamics of the capitalist world economy.[11]

The persistent economic development gap that characterizes the world economy in the era of globalization has led to a renewed interest in dependency theory, with important contributions on specific developing countries, particularly in Latin America.[12] However, without a comprehensive global perspective, it remains open whether dependency is a structural feature of the global capitalist economy rather than a local and historical condition. On this question, it is crucial to identify different criteria for assessing global polarization and dependency separately to avoid objections of circularity.

Regarding polarization, in a post-dualist international division of labor, Arrighi and Drangel argue that a more appropriate criterion is to look at global income inequality.[13] The relative level of per capita income provides a concise indicator of a country's rank in the global hierarchy and serves as a proxy for the concentration of core economic activities within its territory. Assessing a global structure of dependency is more problematic, as it requires a conceptual dividing line between a dominant Center and a dependent Periphery. In this respect, unequal exchange can serve this purpose. Despite the sustained focus on this is-

[9] See Fröbel, Heinrichs & Kreye 1978; pp. 123-142.
[10] See Hutchinson 2004, pp. 4-24.
[11] See Selwin 2012, pp. 205-226; Ricci 2021, pp. 59-75.
[12] See Kvangraven 2020, pp. 76-112.
[13] Arrighi & Drangel 1986, pp. 9-74.

sue, however, dependency theory has not recognized unequal exchange as the basic conceptual marker of dependency. According to Dussel, this constitutes a theoretical flaw, insofar as it ignores the essential causes of dependency and focuses instead on contingent historical elements associated with monopolistic structures.[14] In his Marxist view, the essence of dependency is unequal exchange as a general feature of the capitalist world economy, resulting from competition between national capitals.

In this regard, recent Marxist contributions have argued that unequal exchange is the result of the spontaneous operation of the international law of value given different levels of capital accumulation across countries.[15] In countries with higher labor productivity, each unit of social labor acquires a higher international value, which is reflected in a higher monetary expression of labor time. Therefore, a unit of international money, i.e., a dollar, has a lower value in richer countries, as indicated by a higher general price level and international purchasing power. In other words, at a common international price, residents of richer countries must forego a smaller quantity of domestically produced goods than residents of poorer countries to obtain the same commodity on the world market. In this way, richer countries capture more international value for the same amount of social labor than poorer countries, resulting in unequal exchange. The ratio of market to purchasing power parity (PPP) exchange rates, known as the exchange rate deviation index (ERDI), is used to measure differences in general price levels. Equal terms of trade occur when national currencies have the same international value, corresponding to an identical ERDI, otherwise, there is unequal exchange in favor of the country with the higher ERDI. It is important to note that ERDI is a structural parameter beyond the control of national authorities, resulting from a myriad of market interactions governed by the international law of value.

Unequal exchange implies that the appearance of monetary trade equivalence masks the essence of real trade inequality, because part of the real output produced by the labor and natural resources of the Periphery is appropriated by the Center without corresponding real compensation. As a result of the uneven operation of the international law of value, unequal exchange has a dual dimension: economic in terms of transfers of value as objectified social abstract labor, and

[14] Dussell, pp. 62-101.
[15] See Ricci 2021.

ecological in terms of transfers of natural resources and concrete labor embodied in use value.[16] As such, ecological and economic unequal exchange are two sides of the same coin, a further manifestation, on the scale of the world market, of the mystification of the value form of the commodity, described by Marx as commodity fetishism.[17]

3. *Polarization and dependency in the current world economy*

Based on the above criteria, we can now analyze the global structure of polarization and dependency in the current world economy. The analysis covers the period from 1995 to 2023 and includes 190 countries grouped into 15 regions. According to the UNCTAD definition of commodity dependence, a region is considered extractive if its ratio of primary exports to total exports exceeds 60%, and productive if it is below 60%. Regions with annual GDP per capita below the world average are classified as peripheral and above as central. Dependency is indicated by differences in the value of money as measured by the ERDI. The application of these criteria results in the classification of the global economy into two hierarchical classes, Center and Periphery. Each of these classes comprises two categories of specialization, extractive and productive.

Table 1: The hierarchical structure of the world economy, 1995-2023

Hierarchy	Region	Specialization	Polarization	Dependency
		CDR	GDP pc	ERDI
Extractive Periphery	*Sub-Saharan Africa*	0,80	0,15	0,61
	North Africa	0,71	0,35	0,45
	Russia,ex-CSI, Central Asia	0,67	0,54	0,49
	South America	0,72	0,77	0,76
	Middle East	0,75	0,94	0,69
	Total	0,73	0,44	0,63
Productive Periphery	*South Asia*	0,35	0,12	0,41
	Southeast Asia	0,33	0,29	0,47
	China	0,08	0,51	0,74
	Central America	0,24	0,81	0,73
	Eastern Europe	0,19	0,96	0,63
	Total	0,18	0,35	0,61

[16] See Ricci 2023, pp. 22-42.
[17] See Marx 1990, pp. 163-177.

Extractive Centre	*Oceania* Total	0,78	3,43	1,46
Productive Centre	*EMU*	0,19	3,88	1,24
	East Asia	0,10	4,17	1,50
	Western Europe	0,29	5,15	1,54
	North America	0,27	5,53	1,43
	Total	0,20	4,66	1,36
World	World	0,27	1,00	1,00

Sources: own elaborations on IMF and UNCTAD Database. Average annual data for 1995-2023. CDR=primary exports to total exports ratio; GDP pc=normalized GDP per capita in dollars; ERDI=exchange rate deviation index.

Table 1 reveals key structural characteristics of the contemporary world economy. First, export specializations indicate the emergence of a post-dualistic international division of labor, as both Center and Periphery are now internally differentiated into extractive and productive regions. Second, global income distribution remains highly polarized, with central regions having per capita income levels many times higher than peripheral regions, regardless of their specialization. Finally, the ERDI shows a clear divide between central regions with general price levels above the world average and peripheral regions below. Mirroring global income polarization, a global pattern of dependency emerges from unequal exchange, mainly in the form of ecological transfers from the extractive Periphery and labor transfers from the productive Periphery. Ecologically unequal exchange implies that part of the Center's domestic material consumption comes from the uncompensated appropriation of biophysical resources of the Periphery that would otherwise be preserved in the natural ecosystem, resulting in ecological load displacement. At the same time, part of the real output produced by peripheral labor is freely appropriated by the Center through economic unequal exchange, resulting in an increase in the wealth of the Center rather than in the wages of peripheral workers.

Neoliberal globalization has not changed the hierarchical structure of the world capitalist economy inherited from colonialism. It has led to a functional differentiation between an extractive Periphery as a net supplier of natural resources and a productive Periphery as a net

supplier of labor to feed capital accumulation in the Center. Rather than representing an economic upgrade, peripheral industrialization establishes a new pattern of dependency that is complementary to the traditional extractive pattern, with China being a partial exception. The development strategies of the peripheral countries are thus called into question.

4. *Delinking of the South and degrowth of the North: Towards an eco-socialist transition*

ISI was not the only policy option inspired by dependency theory. At the same time, a more radical strategy was formulated. Among its leading proponents were two African Marxists: Samir Amin,[18] who called it "delinking", and Walter Rodney,[19] who called it "disengagement". Both argue that the development of the Periphery necessarily involves a break with the world capitalist system in favor of an autocentric economic and social model. This means not autarky, but the adoption of alternative criteria of economic rationality to the international law of value, in which the allocation and use of economic and ecological resources are placed under national and popular control.

Given the failure of previous strategies, delinking is even more relevant today. Its actual feasibility, however, relies on two basic conditions. The first is the introduction of a system of democratic economic and ecological planning in which the market plays a subordinate role to the collective decisions of the associated producers. In this sense, delinking is a socialist strategy. But this condition alone is not sufficient. As the socialist and revolutionary experiences of the 20th century has shown, a planned economy is doomed to economic and ecological failure if individual and social needs and state priorities are modeled on the capitalist structure of needs. Delinking cannot be a way to ensure that the vast populations of the global Periphery have faster access to the imperial mode of living of the capitalist Center. This requires massive imports of technology, capital and consumer goods, which only total subordination to the global market can provide, but with the consequence that only a small, privileged class can enjoy them, leaving the great mass of the population in material dep-

[18] Amin 1985.
[19] Rodney 2022.

rivation. The second condition for a delinking strategy is, therefore, that the changing structure of supply, resulting from socialist democratic planning, must be associated with a corresponding change in the structure of social demand, not as a forced imposition from above but as an expression of new radical needs from below. In this perspective, delinking represents an ecological strategy that calls for moving from a quantitative notion of development as boundless economic growth to a qualitative conception of well-being.

The 20th-century labor movement failed to make this paradigm shift, even though it was an integral part of Marx's conception of communism, and this is one of the main reasons for its defeat. In the Periphery, however, new movements have emerged that are critical of past developmentalist strategies, such as Buen Vivir in Latin America, Ubuntu in Africa, and National Happiness in Asia. Rejecting the universal commodification of life and nature, they draw on the traditional values of non-Western indigenous cultures to promote a post-development transition. Moreover, eco-feminist and peasant practices of resistance have spread, weaving community social bonds outside market imperatives. Their alliance with the left and national liberation forces can form a new historical bloc for an ecosocialist strategy that combines delinking and degrowth into a coherent path of emancipation of the Periphery from dependency.[20]

A delinking strategy of the Periphery would also affect the Center. The reduction of unequal exchange would reduce the transfers of labor and natural resources implicit in international trade, forcing central countries to restructure their economies. This transformation would make the pursuit of unlimited economic growth virtually impossible, and degrowth would emerge as the only realistic solution for the Center. However, degrowth as a mere result of economic depression is a regressive perspective, because the spontaneity of market adjustments and existing power asymmetries would reproduce the social injustices and ecological disorder of neoliberalism. To be a progressive outcome, degrowth in the Center requires a radical socio-ecological transformation. It calls for democratic economic and ecological planning based on social justice and the restoration of the natural cycles of ecosystems. In this sense, degrowth in the Center, like delinking in the Periphery, is an ecosocialist strategy that requires the formation of

[20] Ricci 2024, pp. 1-16.

a new historical bloc based on the popular subaltern classes. The alliance between the traditional labor movement and the new ecological and social movements is a crucial step in this direction. In conclusion, around the binomial "delinking of the South-degrowth of the North," it is possible to outline a global strategy of eco-social transformation to face the social, climatic and ecological crisis by setting the stage for global democratic planning.

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Labour and Form – Revisiting "Stoffwechsel": Towards a Symmetrical Understanding of Metabolism in the Built Environment

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Abstract

In my article, I will revisit the German term "Stoffwechsel," which was coined in the 19th century by such prominent figures as the chemist Justus von Liebig, who defined the term scientifically; literally, Stoffwechsel means "(ex)change of matter." Over the course of the 19th century, the term Stoffwechsel moved beyond its scientific origins in physiology and reverberated widely across the areas of economics, technology, art, and architecture. In the light of these writings, Stoffwechsel means both the "transformability of materials" in architecture (Ákos Moravánszky) and the "metabolic regimes" of urban and planetary systems (Timothy Morton), thus addressing the character of the development of the material world. According to Marx, Stoffwechsel does not occur solely as a biochemical automatism, but always requires also "labour," representing a process between man and nature. Through labour, Stoffwechsel leaves the purely natural automatisms, such as digestion or photosynthesis. The decisive factor here was to analyze metabolism not as a mere abstraction, but as a concrete, one might say *conscious* exchange of matter through transformative labour, which corresponded to the fundamental intuitions of the architect Gottfried Semper. Semper carried out an early anthropological analysis of labour as a process of making, which added the aspect of *form* to the production of things that cannot be reduced to technology and matter. It is only by considering this complementary theoretical legacy that the significance of Stoffwechsel for today's ecological thinking can be revealed.

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Keywords: Metabolism, Ecology, Evolution, New Gourna, Karl Marx, Gottfried Semper, Hassan Fathy

1. *The Complementary Stoffwechsel Legacy of Karl Marx and Gottfried Semper*

Although the physiological foundations of Stoffwechsel thinking were already laid in the early modern period[1], the term "Stoffwechsel" only acquired its current meaning in the 19th century, exactly when the term moved beyond its scientific origins in biochemistry.[2] Karl Marx and Gottfried Semper, most prominently, gave the concept of Stoffwechsel a central place in their respective theoretical works, *Das Kapital* and *Der Stil*, two seminal publishing projects that both appeared since the 1860s. Within the scope of these publication projects, Stoffwechsel proved to be a lens through which the long-term, both nonlinear and noncyclical nature of material development can be understood.

According to Marx in the *Capital*, "labour" is described as a "process in which both man and Nature participate".[3] Through labour, man "confronts the natural substance itself as a natural power"[4] and through human labour, socio-ecological Stoffwechsel transcends the purely natural automatisms, such as bodily digestion or photosynthesis on agricultural land. Marx's approach to Stoffwechsel relied on the integration of all conceivable scales, from the chemical raw material to the earth, of globalized production with consumption. The basis for such a planetary analysis by Marx was the comprehensive reception of the scientific-technical writing of his time. The material interdependence of nature and society became conceivable in this way, and with it also the extraction, production, use and wear of matter in architecture

[1] Büttner, Johannes, & Lewicki 2001; Patkauskas 2025, p. 56.
[2] Justus 1842; Moleschott 1851.
[3] Marx 1909, p. 198.
[4] *Ibidem*.

and construction. The decisive factor here was to analyse Stoffwechsel as a concrete exchange of matter through "traces of labour",[5] which corresponded to the basic intuitions of the architect Gottfried Semper.

Stoffwechsel formed the core of Semper's theoretical edifice, which aimed at an integrated understanding of empirical description and the desirable development of constructed artifacts. Semper carried out an early anthropological analysis of labour, which added the aspects of design and form to the production of things that cannot be reduced to technology and materiality. For Semper, Stoffwechsel relies on "traces" of *memory* and *labour* and it is their multi-layered nature in space and time that became the actual theme of his notion of Stoffwechsel. Semper paid particular attention to the hybrid forms and transitional stages that result from the mutual influence of building industries – from textiles to clay, wood, metal, and stone. Materials and technologies, manual and mechanical practices mix in metabolic processes with traces of earlier materials and become the basis of both arts and crafts and monumental architecture. In this context, Ákos Moravánszky speaks of an almost "alchemical" process that shapes architectural development under Stoffwechsel premises.[6] Semper's *Stoffwechsel principle* can be conceived as an attempt to formulate transformation rules of design and architectural artefacts that are determined by the logic of life itself – however without relying on predefined determination.

Critically rethinking this figure of thought, as coined in the 19th century, this articel aims to establish a field of Stoffwechsel epistemologies against the backdrop of broader discussions about the built and unbuilt environment.. While the theoretical content of the term Stoffwechsel has increasingly relied on the idea of a dynamic stabilization of large systems (as metabolism), the literal transformation of things (as metamorphosis) was more and more neglected in theory at large. Focusing on the built environment, this paper advocates for a symmetrical ecological re-appropriation of Stoffwechsel, which is leading to a rethinking of the material processes in architecture in light of the climate crisis. The concept of Stoffwechsel "as a diachronic principle" emphasizes a long-term, evolutionary understanding of ma-

[5] Ursprung 2021.
[6] Moravánszky 2017.

terial development,[7] which integrates the two dimensions of *metabolism* and *metamorphosis* and remains open to deliberate interventions through design. First, I will begin with theoretical considerations on Stoffwechsel as an evolutionary principle and on the cognitive significance of the (human) hand within processes of "constructing the world".[8] Secondly, I will highlight the exemplary attempts by architect Hassan Fathy to consciously introduce a new type of Stoffwechsel into Egyptian building culture in the mid-20th century, coined by the use unfired bricks and slef-building strategies. Here, it should be clear that we must necessarily rely on the dual legacy of Stoffwechsel, as coined by Marx and Semper, in order to understand the actual difficulties involved in introducing more sustainable modes of construction.

2. *Evolution – From Unconscious to Conscious Stoffwechsel*

According to Christopher Alexander, every design problem begins "with an effort to achieve fitness between two entities: the form in question and its context", which he also referred to as "the fit between form and context".[9] Alexander explicitly referenced Charles Darwin when using the term "well-adaptedness": "There is a wide variety of ensembles which we can talk about like this. The biological ensemble made up of a natural organism and its physical environment is the most familiar: in this case we are used to describing the fit between the two as well-adaptedness".[10] However, in the context of human material culture Alexander developed his key thesis on fitness using indigenous or vernacular structures which, like the homeostasis of an organism, act as a metabolic mechanism for adapting to complex environmental conditions. Alexander proposed developing design methods that are able to withstand the sheer complexity of modernity without ignoring the evolutionary laws of traditionally built forms. Ambiguously, Alexander addressed the unsuitability of traditional architectural solutions (he calls them "unselfconscious") for the contemporary needs of urban societies, while at the same time criticising the inability of

[7] Roesler 2025.
[8] Roesler 2021.
[9] Alexander 1971 (1964), p. 19.
[10] *Ivi*, p. 196.

academic architecture (which he describes as "self-conscious") to even come close to the adaptive qualities of traditional construction methods. Or, as Philip Steadman put it in 1979 in his fundamental study *The Evolution of Designs,* "how to achieve by a 'selfconscious' design method the results of the evolutionary design processes operating in primitive cultures or in the vernacular?".[11]

In this context, the so called *bionics* has led since the 1960s to a noteworthy integration of the natural and the cultural history of building in architectural discourse. In a bionic understanding, human constructions are derived from the "constructions" of inanimate and animate nature. Frei Otto's idea of a "natural construction"[12] renaturalizes what is specifically human about building: the constructiveness of construction, and transfers this to all things in the world. The structure of living beings – plants and animals – became a model, particularly for the idea of what constitutes an evolutionarily optimized form. From this perspective, Lewis Mumford astutely noted in an 1966 essay that "technology" was "not exclusively human," but rather a general characteristic that connected animals with humans. It was only when the (primitive) tool production of Homo sapiens was modified by their own symbol production (in language, culture, and society) that the cultural trigger effect resulted in a specifically human technological capacity. Unlike animals, Homo sapiens possesses a "mind-activated body".[13] According to Mumford, human construction cannot be understood outside the context of the interaction between tool and symbol production.

In any comprehensive definition of technics, it should be plain that many insects, birds, and mammals had made far more radical innovations in the fabrication of containers than man's ancestors had achieved in the making of tools until the emergence of *Homo sapiens*: consider their intricate nests and bowers, their beaver dams, their geometric beehives, their urbanoid anthills and termitaries. In short, if technical proficiency were alone sufficient to identify man's active intelligence, he would for long have rated as a hopeless duffer alongside many other species.[14]

[11] Steadman 2008 (1979), p. 164.
[12] Institut für leichte Flächentragwerke 1982.
[13] Mumford 1966, p. 129.
[14] *Ibidem*.

3. *Hands – The Body Disposition of Labour*

However, according to architectural anthropologist Nold Egenter, the nest-building behavior of great apes (orangutans, gorillas, and chimpanzees) demonstrates a structural ability that differs qualitatively from the territorial behavior of other animal species. Egenter sees the decisive difference in the "constructivity" of great apes,[15] which is "no longer just adaptation to what nature happens to offer," but rather "a clearly defined and systematic effort to adapt their environment to their own needs.".[16] The constructive ability of great apes is evident in the fact that even in captivity they can "relate to a wide range of materials" (Egenter 1983: 6). In addition to intertwining branches, they have also been observed stacking stones or fallen wood, similar to human construction activities. It is precisely here that option-based approaches (of a human nature) can be observed, although from an architectural point of view, the most precarious structural designs emerge. In the vegetative platforms of the great apes, already Darwin recognized the precursor artifacts of "rough architecture and clothing." In *The Descent of Man*, Darwin discusses the nest-building habits of orangutans:

> The anthropomorphous apes, guided probably by instinct, build for themselves temporary platforms; but as many instincts are largely controlled by reason, the simpler ones, such as this of building a platform, might readily pass into a voluntary and conscious act. The orang is known to cover itself at night with the leaves of the Pandanus; and Brehm states that one of his baboons used to protect itself from the heat of the sun by throwing a straw-mat over its head. In these several habits, we probably see the first steps towards some of the simpler arts, such as rude architecture and dress, as they arose amongst the early progenitors of man.[17]

In this context, Friedrich Engels emphasized the importance of the hand in human labour in his essay "The role of labour in the humanization of apes," published in 1876, which was clearly influenced by Darwin's writings. Engels writes: "the hand is used differently from

[15] Yerkes & Robert 1929.
[16] Egenter 1983, p. 4.
[17] Darwin 1882, p. 82.

the foot when climbing. It is used primarily for picking and holding food, as is already the case with lower mammals using their front paws. Some apes use their hands to build nests in trees or even, like chimpanzees, roofs between the branches to protect themselves from the weather".[18]

4. *Stoffwechsel Experimentation – From Fired to Unfired Brick*

However, the question remains whether architects can escape the logic of hegemonic modern building industries and instead *consciously* (as suggested by Christopher Alexander) promote Stoffwechsel as broad material transformation and create a productive interplay between structural and symbolic building elements. To answer this question, the case of the Egyptian resettlement village of New Gourna (near Luxor), designed by the famous Egyptian architect Hassan Fathy (1900-1989), might be seen as an exemplary site of Stoffwechsel experimentation (Roesler 2018). New Gourna was built during the decisive transitional period from kingdom to modern nation state in the middle of the century. It stands for a new cultural and political self-confidence of Arab societies. The unconscious Stoffwechsel of the traditional mud brick construction method in Egypt and its replacement through a modern system of building materials (concrete and fired bricks) served as a critical context.

Fathy received the commission for the New Gourna village from the Antiquities Department of the Egyptian government in 1945. The task was to design a new village for the inhabitants of the existing village of Gourna. Located northwest of Luxor on the burial grounds of the necropolis of Thebes, the inhabitants made their living by, among other things, selling artifacts found in the rock tombs to English tourists. In order to put a stop to this practice, the government resolved to build a new village three kilometres away from the old one and relocate the inhabitants there. Originally planned for around nine hundred families, housing units for one hundred thirty families were finally completed, occupying a fifth of the planned area. A school, a mosque, a theatre, and other public buildings were built in addition to the residential complexes.

[18] Engels 1975 (1925), p. 164.

The outstanding architectural-historical significance of New Gourna, built between 1946 and 1952, lies in the combination of two approaches: Firstly, in the preliminary design stages Fathy decided to reject building materials that were considered modern already at the time – reinforced concrete and fired brick – in favour of using air-dried mud bricks only. And secondly, Fathy introduced a new form of assisted self-construction into the production process: the village was built by its future inhabitants themselves.

Without abandoning the modernisation goals of the modern architect, Fathy drew on local building techniques.[19] The clay brick construction method of the "Nubian vault" allowed archs and domes to be built without timber formwork. Fathy's adaptation of this construction technique in New Gourna has preserved an architectural motif and construction technique from another ethnic group: a Stoffwechsel phenomenon driven by the architect's desire to modernize and his aesthetic preferences. Fathy came across this construction method during his quasi-ethnographic excursions in Nubia in the early 1940s, and subsequently adapted it in New Gourna. The tradition, which was still alive in Nubia before the construction of the Aswan Dam, was passed on to the inhabitants of New Gourna by Nubian master masons. Fathy studied the dome in terms of its spatial, climatic, and symbolic potential; it forms the central architectural motif of New Gourna, where it was used on all building types.

However, from the beginning, New Gourna was overshadowed by the residents' reluctance to accept their new home. In the course of the construction process, Fathy was confronted with growing resistance from the inhabitants to the resettlement project. The history of the failure of New Gourna offers material for reflecting on consciously introduced Stoffwechsel in architecture. The translation of architectural tradition was neither completed with the design nor with the construction of the village; rather, it extended into the transformation history of New Gourna. Most of the erected mudbrick buildings were transformed by the residents and fired brick buildings and concrete structures started to overlay and complement the ruined clay buildings, which have suffered from a lack of maintenance and recognition. The use of concrete technologies came to be associated with "status and prestige".[20]

[19] Fathy 1973, p. 8.
[20] Marchand 2006, p. 49.

5. *Making – Rethinking Labour and Form*

Both Marx and Semper focused on "praxis", on the "making" of things ("herstellen"), based on the conditions set by human labour,[21] which directly implies the tension between matter and form in architecture and urban development. "Marx's Ecology"[22] anticipated the approaches of contemporary interdisciplinary natural sciences, which analyse the "Earth's metabolism" in the "Anthropocene".[23] However, Marx's understanding of Stoffwechsel has to be complemented by Semper's notion of material development that takes the logic of design and making more thoroughly into account. In material culture, technical and symbolic content is always transmitted simultaneously and often in contradictory ways, as the example of the resettlement village of New Gourna shows. In an integrated sense, including metabolism and metamorphosis, Stoffwechsel represents a theoretical concept that describes and defines material development; it aims at an integrated understanding of empirical description and the desirable development of artifacts. Stoffwechsel designates a network of relationships between matter and form that cannot be abstracted from the way matter, as an integral part of the natural environment, is transformed and shaped into the human-made environment.

Today, the central question remains how a bridge can be built from an empirical investigation of unconscious Stoffwechsel to conscious Stoffwechsel, realized by individuals and collectives. Decarbonization, for example, which is supposed to take place today in architecture and material culture is based on future-oriented, normative-political assumptions that can only be fulfilled by linking "imagination and matter" – an integration that philosopher Gaston Bachelard had in mind in his 1942 essay "Water and Dreams." Bachelard speaks of "the profound and complex sensualism of material imagination" beyond pure empiricism.[24] At a similar time to Bachelard, in the *Arcades Project*, Walter Benjamin described technical production in certain stages as "dreamlike" and architecture as testimony of "a collective dream" – expressions that aptly describe the complex mechanisms of Stoffwechsel noted by Marx and Semper.[25]

[21] Arendt 1960.
[22] Foster 2000.
[23] Steffen 2000.
[24] Bachelard 1983 (1942), p. 152.
[25] Benjamin 1982, p. 213.

It is not only the 19th and 20th century with their belief in progress, that can be described in terms of Stoffwechsel in the context of the incipient industrialization of the building industry, the 21st century is also struggling with how ecological change can be consciously introduced into the existing construction industries; today's climate crisis must be read as an eminent driver for Stoffwechsel phenomena. Marx' and Semper's anthropological question about the logic of Stoffwechsel forms the starting point for an analysis that is derived from material and construction knowledge and attempts to shape the future (under crisis-ridden conditions).

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Planetary Antagonism: Climate Politics between Populism and Fanaticism

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Abstract

This article examines the viability of "the planetary" as a political concept by analysing the antagonistic logics embedded in the Anthropocene and Capitalocene discourses. Drawing on Chakrabarty's claim that climate change produces a "negative universal history" grounded in shared vulnerability, the paper first reconstructs how each discourse constructs its figure of the enemy and conceptualises human collectivity. Methodologically, it juxtaposes the political theories of populism and fanaticism to assess their capacity to generate a coherent collective political subject under conditions of ecological crisis. The analysis shows that while populism offers a flexible mechanism of equivalential mobilisation, its inherent instability and shifting signifiers limit its suitability for long-term planetary politics. By contrast, the Capitalocene's emphasis on structural logics of extraction aligns more closely with the uncompromising commitment characteristic of fanaticism. The article argues that this coupling provides a more coherent foundation for sustained political mobilisation in the face of existential climatic threats.

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Keywords: Populism, Fanaticism, Anthropocene, Capitalocene, Planetary

1. *Introduction*

In *The Planet: An Emergent Humanist Category*, Dipesh Chakrabarty asks whether the category of the planetary should serve as an optic for philosophical analysis. Earlier answers to this question were negative. Heidegger held that the planet understood as an astronomical body has no particular philosophical relevance.[1] By contrast, the Earth understood as the condition of possibility for human life, that is, the layer in which rivers flow and fertile soil yields crops, which scholars in Earth System Science refer to as the critical zone, is of philosophical interest. From Heidegger's perspective, and with some simplification, this could be said of anthropocentric philosophy more broadly, since such an Earth is related to human experience. The same applies to the concepts of Globe and World.[2]

Chakrabarty's argument is grounded in an idea that has become common in contemporary ecological thought and in several specialised sciences such as climatology and Earth System Science. The influence of the human being, understood as a biological species, has long exceeded the limits of the critical zone, and the human has become a major geological force or agent. In this context, the relevance of the planetary as an instrument of philosophical analysis appears indisputable. Yet, as Chakrabarty himself notes, a problem emerges at the next level, the political one. If the dominant discourse of the Anthropocene is correct and humanity faces an ecological catastrophe, the question of unprecedented cooperation arises, that is, a form of collective action capable of encompassing the entire planet. The difficulty is that "the political is the pluriverse".[3] For Schmitt, the basic division between friend and enemy blocks any prospect of forming a universal subject. Minca and Rowan summarise Schmitt's verdict on global unity: "For Schmitt, however, world unity would literally make the planet a utopia, a noplace lacking any spatial divisions and hence any grounds for establishing order and managing conflict. Deprived of any form of 'global linear thinking',[4] the planet would become a realm of global police defined by ever deeper discriminations and

[1] Chakrabarty 2019, p. 2.
[2] *Ivi*, p. 5.
[3] *Ivi*, p. 27.
[4] Schmitt 2003, p. 87.

nihilistic violence. In this 'terrifying world without exterior',[5] policing criminals and waging absolute wars of annihilation against the 'enemies of humanity' would become indistinguishable."[6]

If we follow this line of thought and assume that the limit of any unity lies in antagonism and negativity, we are inevitably led to the conclusion that the planetary is a deeply problematic political concept. This, however, does not imply its impossibility. Chakrabarty himself, in four theses, proposes one way of constructing humanity through shared negativity.[7]

In this study, we aim to examine possible logics for constructing a collective political subject based on two opposing discourses, the Anthropocene and the Capitalocene, while assuming the fundamental, irresolvable, and simultaneously constitutive nature of antagonism in the social sphere.[8] We start by outlining the key ideas of the Anthropocene and Capitalocene discourses, paying special attention to the ways in which each constructs the figure of the enemy. We then consider which antagonistic political logics can provide theoretical foundations for the formation of a political subject in both cases, namely populism and fanaticism. Populism, as a political logic, relies on the mobilisation of heterogeneous social demands centred on an "empty signifier", whereas fanaticism also constructs a chain of equivalence but seeks to fix a particular meaning, that is, it is built around "unconditional commitment/conviction". In conclusion, we discuss the potential implications of combining these political logics with the discourses of the Anthropocene and the Capitalocene.

2. *Two Planetary Discourses: Anthropocene and Capitalocene*

In 2000, the chemist Paul Crutzen and the ecologist Eugene Stoermer proclaimed the advent of a new epoch in geological history – the Anthropocene.[9] The idea of the profound impact of humans on ecological systems is not, however, new and can be traced at least as far back as the mid-nineteenth century.[10] The development of clima-

[5] As cited in Ojakangas 2006, p. 16.
[6] Minca & Rowan 2015, p. 283.
[7] Chakrabarty 2009, pp. 221-222.
[8] Marchart 2007.
[9] Crutzen & Stoermer 2000, p. 17.
[10] E.g. Sutter 2023.

tology and Earth System Science in the 1970s and 1980s, as well as the activities of early pre-climatic ecological social movements such as Earth First!*, paved the way for alternative, more holistic ways of thinking about human-nature relations. Yet, it is only with the introduction of the term Anthropocene that the ecological discourse becomes truly pervasive.

The Anthropocene is the name of a geological epoch (International Union of Geological Sciences, n.d.), alongside the Holocene, Miocene, and others. The idea behind the term is that "anthropos", at a certain point in its development, began to influence the geological and climatic systems of the Earth, or, more radically, became a "major geological agent".[11] Within the Anthropocene debate, there are a number of disputes, some of which are strictly scientific and technical, concerning which formal marker, the so-called Golden Spike, should be considered the indicator of the epoch's onset. On the other hand, there are more speculative, yet socially and politically relevant, discussions regarding precisely when the Anthropocene began and what caused it. In essence, these two questions are interconnected, and without addressing the second, it is impossible to provide an adequate answer to the first. The prevailing narrative links the onset of the Anthropocene to the Industrial Revolution in England, during which the use of fossil fuels increased exponentially. This process subsequently accelerated, and by the twentieth century, atmospheric CO2 levels had risen twenty times more than during the period from the eleventh to the eighteenth centuries.[12]

Alternative chronologies also exist, including the "Early Anthropocene" theory,[13] which attributes the onset of the Anthropocene to mass extinctions of animals (megafauna), the domestication of livestock, or early agriculture. More broadly, when considering the internal logic driving humanity toward the Anthropocene, one can, with some simplifying generalisation, point to the ancient transition to energy technologies based on combustion,[14] which occurred at least 50,000 years before the present.

[11] Zalasiewicz et al., 2017, p. 59.
[12] Steffen, Crutzen & McNeill 2007, p. 617.
[13] Ruddiman 2003, pp. 261-262.
[14] Steffen, Crutzen & McNeill 2007, p. 617; Raupach & Canadell 2010, pp. 210-211.

Here we can turn to the problems of the Anthropocene and its principal conceptual alternative. First, the Anthropocene discourse tends to essentialise humanity, understanding it as a biological species,[15] with an internal logic that is, in a sense, ironclad, exemplified by the use of fossil fuels, from the first fire to nuclear power plants. The notion of an indivisible, essential humanity gives rise both to purely analytical difficulties and to ethical and political ones. First, as Malm and Hornborg ironically note, it is akin to "explaining the success of Japanese fighter pilots by the evolution of primates, which provided them with binocular vision and opposable thumbs. We expect the causes we cite to be much more directly connected to the outcomes".[16] Second, from an ethical perspective, through the lens of climate justice,[17] different groups, countries, and classes have contributed disproportionately to climate change and should accordingly bear differentiated responsibility.

The principal conceptual rival of the Anthropocene, the Capitalocene, shares certain similarities with it. Primarily, both recognise the existence of humanity within a new geological paradigm. On the other hand, the Capitalocene exhibits a deep scepticism towards the modern distinction between humans and nature.[18] For theorists of the Capitalocene, however, the key question concerns the "sociogenic" character of the ecological crisis, in the words of Malm and Hornborg.[19] Thus, for leftist critics of the Anthropocene, responsibility for the planetary crisis lies not with humanity in general, but with a specific system, a particular logic of appropriation. This logic is most fully developed in the work of Jason Moore, the principal "ambassador" of the Capitalocene. Capitalism, which emerged in the sixteenth century and rapidly evolved into a global system (continuing the tradition of world-systems analysis), was founded upon the logic of "Cheap Nature". The rationalist culture of the early modern period was built upon the Cartesian distinction between res cogitans and res extensa. Within this model, as Moore argues, "Nature" – which often included certain human populations, for example, the indigenous peoples of the colonies – consisted of free resources, such as land,

[15] Chakrabarty 2009, p. 201; Moore 2016, p. 1.
[16] Malm & Hornborg 2014.
[17] Arcaya & Gribkoff 2022.
[18] E.g. Chakrabarty 2009, p. 201; Moore 2016, p. 1.
[19] Malm & Hornborg 2014, p. 66.

rivers, forests, and mineral deposits, effectively granted to "Man" as a gift. The exploitation of this free gift generated extraordinary profits, yet inevitably depleted its sources. In this way, capitalism sought new sources of "Cheap Nature", ultimately extending to planetary scales and beginning to undermine the very foundations of life on Earth.[20]

In this study, we do not aim to examine the debate between the Capitalocene and the Anthropocene in detail. Dipesh Chakrabarty has addressed leftist critiques in a number of works,[21] while proponents of the Capitalocene have, in turn, criticised arguments concerning "lifeboats".[22] Each approach has its notable strengths and limitations. For example, the Anthropocene perspective allows for the capture of much longer temporal sequences that are not limited to economic cycles, whereas the Capitalocene (or other sociogenic -cenes) emphasises that human nature is not static, and that variable social systems are themselves part of human nature.

We now return to the questions raised by Chakrabarty in The Planet: An Emergent Humanist Category. The political is a pluriverse, and rational deliberative communication is constrained. How can the planetary dimension be translated from the level of philosophy and science to the level of collective political action, when such action is necessary to prevent catastrophe? Chakrabarty's answer is that the universality of humanity can only be negative, a universality in the face of shared catastrophe. Can such a regime of negativity be translated into a model of political mobilisation? In the following chapter, we examine the political theory of populism and its possible implications for the discourse of the Anthropocene.

3. *Negativity and the Logic of Populist Mobilisation*

Negativity as a basis for constructing a collective subject is by no means new to political theory, at least since the early modern period. For Thomas Hobbes, the sovereign, as an artificial body representing the people, possesses value not by virtue of any inherent quality, but solely because the sovereign stands against a state of absolute social

[20] Moore 2016.
[21] E.g. Chakrabarty 2014, p. 3; Chakrabarty 2017, pp. 28-29.
[22] Malm & Hornborg 2014.

disorganisation.[23] For Schmitt, whom we already referenced in the introduction, the political is constituted through the opposition of friends and enemies, and the condition for political unity is precisely this confrontation.[24] Chakrabarty, both a leading theoretical ambassador of the Anthropocene and a prominent scholar of critical theory, recognises the constitutive significance of negativity. As he notes in his Four Theses,

> Species may indeed be the name of a placeholder for an emergent, new universal history of humans that flashes up in the moment of the danger that is climate change. […] Yet climate change poses for us a question of a human collectivity, an us, pointing to a figure of the universal that escapes our capacity to experience the world. It is more like a universal that arises from a shared sense of a catastrophe. It calls for a global approach to politics without the myth of a global identity, for, unlike a Hegelian universal, it cannot subsume particularities. We may provisionally call it a 'negative universal history'.[25]

As we can see, the collective subject of humanity emerges together with a universally experienced sense of catastrophe, very much in a Hobbesian style. Yet, although the absolute ideal of democracy may be conceived as an "empty place of power",[26] it cannot be entirely empty. Like the Hobbesian sovereign, it derives value not from intrinsic content, yet it nevertheless possesses content.

What might occupy the "empty place of power" while remaining sufficiently "empty," a placeholder as Chakrabarty puts it? Here, the theory of populism and, more broadly, Ernesto Laclau's discourse theory of hegemony offers insight, coming closest to what might be described as "empty emptiness." For Laclau, negativity is a condition for the possibility of any given system of meanings – for a system to stabilise, it requires a boundary and cannot encompass all elements simultaneously.[27] At the same time, every element of the system, understood purely differentially in the structuralist tradition,[28] possesses

[23] Laclau 2015b, p. 73.
[24] Schmitt 2007.
[25] Chakrabarty 2009, pp. 221-222.
[26] Accetti 2015.
[27] Laclau 2015b.
[28] Laclau 2015a, pp. 24-25.

a dual nature: on the one hand, it has its own particular, differential content, and on the other, it can assume the role of representing the unity of the entire system.[29]

At a less abstract level, the operation of this mechanism can be illustrated through the logic of populism, which in Laclau's theory broadly corresponds to the logic of constructing collective political subjects. Within this framework, a single particular, unfulfilled social demand is linked with a multitude of other unmet demands to form a unified chain of equivalence, without any common denominator for this aggregation, neither cultural nor economic. The only unifying factor is a shared frustration and antagonism towards the administrative authority or government, which is unable to satisfy these demands.[30]

However, for the chain of equivalence to exist, it requires a common representation. In the absence of a universal denominator, one of the demands assumes the role of representing the whole, a mechanism that Laclau terms a hegemonic relation. On one hand, hegemony is the objective for each particular discourse; on the other, it constitutes a "dangerous victory" because the original content of the demand becomes diluted and loses its specific character.[31] Beyond the antagonistic frontier, a similar level of abstraction exists: just as "the People" is represented merely by a "Name",[32] the enemy is often represented as a highly abstract entity, such as the "corrupt elite".[33] This presents both strengths and weaknesses. The populist subject can encompass a high degree of heterogeneity, yet it is also unstable and potentially susceptible to being "hijacked".[34]

For the Anthropocene discourse, populism as a means of constructing a collective subject is, on one hand, a natural ally, and on the other, a deeply contradictory one. The undivided humanity understood as "Species" implies such a degree of internal heterogeneity that nothing appears to unify it beyond a common name and a shared sense of catastrophe. Yet two questions arise. First, who embodies this catastrophe, who constitutes the common enemy? Humanity cannot fight itself. The figure of the "corrupt bureaucrats" from the populist

[29] Laclau 2015b, pp. 67-68.
[30] Laclau 2015c.
[31] Laclau 2015b, p. 73.
[32] Laclau 2015c, p. 157.
[33] Mudde 2004.
[34] Laclau 2015c, p. 159.

textbook fits this role perfectly. One might recall Greta Thunberg's 2019 address at the World Economic Forum in Davos, where the primary criticism was directed at the logic of business as usual,[35] and at COP25, where she accused politicians and large corporations of merely simulating action rather than taking meaningful measures,[36] in other words, "they do not represent us".

At the same time, we observe a continual shift of the hegemonic element within the chain of equivalence, which might, for example, be LGBTQ+ rights[37] or Palestine Solidarity.[38] We do not mean to suggest that each of these particular struggles lacks value or cannot serve as a hegemonic signifier, or that a certain logic of connection between climate and other social issues cannot be drawn. However, the problem, and this is the key contradiction in combining populism and the Anthropocene, is that once the Anthropocene becomes a surface of inscription capable of encompassing postcolonial, gender, racial, and other concerns, it becomes unclear where climate fits within it. A similar regional example can be seen in Russia in 2019, when environmental protests against the construction of a waste landfill quickly evolved into a confrontation between "periphery and centre" and later "the people and the elites".[39] From the perspective of political mobilisation in its pure form, this is a strength, as the breadth of mobilisation is a success. Yet for a particular discourse, such as combating climate change which requires a consistent set of measures implemented over decades, the constant shifting of signs and their meanings can be an obstacle. Nonetheless, populism is not the only way to construct an antagonistic frontier.

4. *Capitalocene, Fanaticism and Unconditional Commitment*

The first problem in the pairing of populism and the Anthropocene, as we have already noted, is the continual dilution of its content. As Jason Moore aptly observes, "Like globalization in the 1990s, the Anthropocene has become a buzzword that can mean all things to all

[35] Thunberg 2019.
[36] Reuters 2019.
[37] HVG 2025.
[38] The Guardian 2023.
[39] Novaya Gazeta 2019.

people".[40] On the other hand, populism primarily offers mobilisation based on dissatisfaction and non-representation, whereas the Anthropocene, like any other -cene, signals potential extinction or, at the very least, radical alterations to the conditions of life on Earth. This alarmism is reflected both in the names of social organisations, such as The Last Generation and Extinction Rebellion, and in the speeches of the aforementioned Greta Thunberg: "People are suffering. People are dying. Entire ecosystems are collapsing. We are in the beginning of a mass extinction".[41] We are therefore confronted with a far more intense antagonism that engages with existential dimensions, and the figure of the "corrupt politicians" appears, at the very least, insufficiently commensurate with the scale of the problem.

Jason Moore offers an alternative imagination: "No politics of labor without nature, no politics of nature without labor; that emphasizes Climate Justice is Reproductive Justice; that challenges Climate Apartheid with Climate Abolitionism".[42] This quotation is significant for us for two reasons. First, we suggest that the metaphor of climate abolitionism is not accidental. Second, unlike in the Anthropocene discourse, where the arguments cited are connected only contingently, within the Capitalocene they are genuinely subordinated to a common logic of the production of "Cheap Nature," which can encompass natural resources and animals as well as humans, workers, slaves on plantations, and women.[43] This is precisely the Hegelian universality that Chakrabarty seeks to avoid, yet it also constitutes a distinct version of antagonism, one that cannot be adequately described in terms of the classical theory of populism without certain key extensions.

Joel Olson and Alberto Toscano are leading representatives of the revisionist approach to the study of fanaticism. Historically a pejorative term, fanaticism was used to stigmatise the political enemy, associating them with the irrational, the uncompromising, the dangerous to civil society, and the unreasonable subject.[44] Across history, from at least the Protestant revolutions of the early modern period,[45] through

[40] Moore 2016, p. 3.
[41] Reuters 2019.
[42] Moore 2019, p. 54.
[43] Moore 2016, p. 91.
[44] Olson 2007, pp. 686-688; Toscano 2017.
[45] La Vopa 1997.

the Enlightenment discourse with its intolerance of religiously irrational behaviour, and subsequently in conservative post-French Revolution discourses freed from religious connotations, the fanatic has functioned as a figure of exception, uniting a heterogeneous collection of diverse movements, sects, and parties.[46]

Nevertheless, proponents of the revisionist approach seek to move beyond a one-dimensional portrayal of fanaticism as merely an external, constitutive figure for certain conservative and liberal discourses, and to recognise in fanaticism a specific political logic possessing both rationality and emancipatory potential. We will not delve deeply into the diverse historical examples of fanaticism, with central examples for Olson and Toscano being the radical abolitionist movement in mid-19th century United States,[47] but we will outline the generalised features of the political logic of fanaticism. For this purpose, it is useful to compare it with populism.

Like populism, fanaticism is based on the construction of an antagonistic frontier that divides society into two camps. It also shares with populism an extreme distrust of deliberation, negotiation, and moderation.[48] However, the similarities end there. Fanaticism is grounded in an "unconditional conviction to an abstract idea" or "urgent devotion to the cause," meaning absolute fidelity to a particular demand or idea, with a resolute refusal to modify it or postpone it to an indefinite future. Toscano opens Fanaticism: On the Uses of the Idea with a vivid illustration of this orientation: "Always, everywhere, John Brown was preaching the primacy of the act. 'Slavery is evil,' he said, 'kill it.' 'But we must study the problem …' Slavery is evil – kill it! 'We will hold a conference …' Slavery is evil – kill it! 'But our allies …' Slavery is evil – kill it!".[49]

As a logic of political mobilisation, fanaticism directly opposes the "dangerous victory" of populism, namely the dilution of the original demand into an empty signifier.[50] This does not, however, mean that fanaticism does not seek to construct a chain of equivalence. Olson provides a striking example by quoting the radical abolitionist Wendell Phillips, who contrasted the "Principle of the North" as encompass-

[46] Toscano 2017, p. 14.
[47] Olson 2007; Toscano 2017.
[48] Colas 1997; Olson 2007; Toscano 2017.
[49] Toscano 2017, p. 20.
[50] Laclau 2015b, p. 73.

ing "equality, free speech, freedom of religion, and democracy" with the "Principle of the South," which represented censorship, religious oppression, a sham democracy, and an "aristocracy of the skin".[51] In fanaticism, the chain of equivalence is centred on a particular demand that must remain unaltered under any circumstances.

Moreover, the antagonistic frontier of fanaticism differs from that of populism. As Olson notes, fanaticism establishes a threefold frontier in which friends confront both enemies and moderates.[52] In this way, fanaticism seeks to eliminate any middle ground, the grey zone in which neutrality might be maintained. One is either for slavery or against it, which underpins the strategy of the radical abolitionists. At the same time, in its most extreme forms, as Toscano demonstrates, fanaticism is associated with apocalyptic expectations, which in turn carry a utopian dimension, as in the case of millenarian movements, and with the depiction of the enemy as morally evil.[53]

We could expand on a range of additional topics within fanaticism, including its rationality and affective dimension[54] and its politico-theological aspects,[55] but the format of this short article does not permit it. What is important is that we consider the logic of the Capitalocene, and of any -cene more broadly, to involve the anticipation of an existential catastrophe that threatens the very foundations of human life on Earth and requires, within these discourses, a set of concrete prescriptions extending over decades. In our view, populism is an inadequate logic of political mobilisation in this context, directly opposing the unfolding of the ecological, or in Gramscian terms, intellectual and moral reform.[56] Climate struggle demands both fidelity to a specific sign or idea and, in the face of a projected "end of the world," assigns opponents an inevitably morally evil character as well as a concrete role. At the same time, the apocalyptic framing itself, together with the urgency and radical nature of the measures required, makes the combination of the Capitalocene and fanaticism a more appropriate pairing for advancing the climate agenda.

[51] Olson 2009, p. 91.
[52] Olson 2007.
[53] Toscano 2017.
[54] Tietjen 2021; 2022; 2023.
[55] Kennel 2022.
[56] Gramsci 1971, pp. 132-133.

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Third Part

Science and Society

Gardening versus Mining: An Analysis of Year of the Weeds

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Abstract

The relationship between science and society has been approached from various perspectives, such as postcolonial, feminist, and Marxist. This paper aims to conceptualise the relationship between science and society in terms of Nancy Fraser's framework of social justice and its recognition and redistribution paradigms. This paper particularly focuses on the arena of national development, one of the dominant categories emerging from the survey of Indian STS. It aims to analyse the relationship between science and social justice as it plays out in the arena of national development in Siddhartha Sarma's 2018 novel, *Year of the Weeds*. The novel foregrounds the cultural, material and spiritual significance of hills for Gonds, a tribe in central India. It raises questions about governance, development, and socio-ecology of these hills that are both home and god to Gonds, but are bauxite reserves for the government. When read from the perspective of social justice, national development in the novel simultaneously raises questions of recognition, i.e., who represents the nation in this developmental model, and redistribution, i.e., how the nation-state allocates resources to different categories of people.

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Keywords: national development, social justice, Indian STS, parity of participation, recognition-redistribution

1. *Introduction*

This paper aims to analyse the relationship between science and social justice as it plays out in the arena of national development. It does so by analysing the notion of development(s) that can be traced in Siddhartha Sarma's 2018 novel, *Year of the Weeds*. Novels such as Siddhartha Sarma's *Year of the Weeds* are not typically classified as science fiction; however, they do examine the myriad ways in which science as a system of knowledge features as a central concern. This paper aims to conceptualise the relationship between science and society in terms of social justice (primarily drawing on Fraser's framework), while acknowledging that it has been done through other robust perspectives like Marxism, Feminism, and Postcolonialism, to name a few. A survey of the field of Indian STS, when put in conversation with Fraser's model of social justice, provides three major arenas where the relationship between science and society can be analysed: 'the nation-state', 'the scientific institutions' and 'the people'. For this paper, I focus on the arena of the nation-state in general and that of "national development", in particular. The category of national development emerges from the mapping of the relationship between science and the contemporary Indian nation-state.

2. *Summary: Year of the Weeds*

The novel focuses on the Gond community, who primarily reside in the central Indian states of Madhya Pradesh, Maharashtra, Telangana, Andhra Pradesh, Bihar, and Odisha.[1] They are recognised as Scheduled Tribes in the Indian Constitution. The novel details the trials and tribulations of the Gond community against the imposition of an exclusionary idea of development, an idea that is premised on the use of science as technology, considered the harbinger of progress. Science is thus tasked with transforming the material world and maximising its utilisation. However, the novel also presents an alternative method of interacting with nature, which emphasises treating nature as sacred and as an extension of one's being. Science, in this case, can be understood as knowledge about the natural world. Korok's garden is an example of this form of knowledge in the novel. Korok, the nar-

[1] Encyclopaedia Britannica 2024.

rator of the novel, is a thirteen-year-old Gond boy, through whom the novel foregrounds the cultural, material, and spiritual significance of hills for the Gonds. The novel portrays Gond's struggle both to understand and counter the idea of development imposed on them by the government. During one of his visits to the hills, Korok learns about the government's plan to turn their hills into bauxite mines, and this triggers a chain of events that finally leads to the Gonds filing a petition to earn the right to vote on this issue. Thus, ensuring that their land, livelihood and God are safe. The novel explores the questions of governance, development, and socio-ecology of these hills, which are home and sacred to the Gonds, but can also serve as bauxite reserves. When read from the framework of social justice, national development in the novel simultaneously raises the questions of recognition, i.e., who represents the nation in this developmental model and redistribution, i.e., how the nation-state goes about the process of resource allocation vis-à-vis different categories of people.

3. *Theoretical Framework: Science and Technology Studies*

This paper enacts Sandra Harding's suggestion, "we should turn to our novelists and poets for a better intuitive grasp of the theory we need"[2] and furthers it by adding that we should turn to newer theoretical frameworks for a novel grasp of the fiction we read. The theoretical framework of this study emerges from the reading of two fields where the relationship between science and society has been analysed. As far as Literary studies is concerned, the science-society relationship has been analysed in the field of Science Fiction Studies; whereas in cultural studies, this relationship has been analysed in the field of Science and Technology Studies (STS hereafter). This paper initiates a dialogue between these fields in order to uncover specific concerns regarding the relationship between science and social justice and its portrayal in *Year of the Weeds.*

Both the fields of Science Fiction Studies and STS (particularly the Marxist and Postcolonial strands) have engaged with the social implications of science and the varied ways in which these implications map out *vis-à-vis* different constituencies (individual, community, and social structures) that comprise and constitute the society.

[2] Harding 1986.

This paper is an attempt to go beyond a mere application of the proposed theoretical framework by putting it in an active dialogue with the novel to assess how the novel, in turn, renews and reshapes the theoretical framework. In line with this argument, I demonstrate how Sarma's novel forms a part of the body of literary texts (both realist and speculative fiction), which I label as "fictions of science", and are centered around the production, dissemination, and function of scientific knowledge in the contemporary Indian context. They participate, advertently or inadvertently, in the contemporary debates around science and society in general and science and social justice in particular. Finally, I argue that *Year of the Weeds* primarily highlights the idea of development, one of the four central categories (the other three being national security, science and citizenship, and science and cultural nationalism) that emerge from the analysis of the relationship between science and the nation-state in the contemporary Indian context.

4. *Definition of Science*

The novel presents two definitions of science, which are simultaneously similar and contrasting. While both definitions are concerned with producing knowledge about nature, they significantly differ in their purpose and method. Clifford D. Conner defines science as knowledge of nature and associated knowledge production activities[3]. In accordance with this definition, both Gonds and government officials are scientific, but their understanding of science differs vastly in terms of its purpose and method. Apart from this, the difference also lies in the way in which the two definitions of science relate to the idea of development.

Gond's knowledge system can be understood by analysing their views about nature, which is sacred and which needs to be felt, rather than understood and analysed. Korok does not know the plants in his garden; he feels them. He shares an affective bond with nature, which also encompasses the sacred hills. The novel also highlights that for Korok and Gonds, the hills are also an embodiment of their ancestors. Korok often visits the hills to talk to his mother, who had died some years ago. This presents another instance of the affective ties that

[3] See Conner 2005.

Gonds have with nature. Thus, unlike the method of modern science, which primarily relies on the method of vivisection,[4] the Gonds try to understand nature in its entirety. Korok, too, applies the empirical method of observation; in fact, the novel highlights his keenness of observation by highlighting how he knows about the needs and nature of all his plants almost by heart. However, he does that without isolating the plants from their natural environment.

The other definition of science is also connected to nature and its understandings, but it aligns with the view that science is an institutionalised system of knowledge produced by and more often than not, for experts and is primarily aimed towards practical application. The novel presents buses and mining marvels of engineering where scientific knowledge has or will result in altering the material world and lead humanity towards progress and development. Here, science is understood primarily in terms of its applicability to engineering, and the method of this scientific enterprise is often violent and 'objective', unlike the method used by Korok. Apart from its method, its purpose is also defined by the maximum utilisation of natural resources in a way that contributes to the building of the national economy. Given this, it could be argued that evaluating science purely in terms of its applicability is fraught with capitalist undertones, and mining presents an example of such an endeavor in the novel.

5. *Definitions of Development*

To understand the meaning of development as it unfolds in the novel, I focus on two major activities that occur within it: gardening and mining. One point of convergence between the two activities is that both involve a certain degree of "taming" of nature. This raises a series of pressing questions: first, what distinguishes these two activities? Second, how do these activities contribute to varying definitions of science and development in the novel? Third, what ideas of social justice do these two activities propound in the novel?

Development is a means to ensure the optimum use of resources by controlling and manipulating nature in ways that leave it with no possibility of regeneration. As Rousseau puts it, the mark of a civilised society is how efficiently it makes use of its resources. Thus,

[4] For a detailed analysis, see Visvanathan 1990.

any deviation from this model of development, which focuses on optimal utilisation (mostly translating into the exploitation of resources), not only makes it anti-capitalist but also uncivilised. A similar line of thought is palpable in the novel, as the nation-state not only deems the Gonds as poor but also criminalises them by the virtue of their class and status. By extension, the Gond people are deemed as unscientific and uncivilised by the nation-state. Gonds are thus criminalised because, for the state, they are a roadblock in its road to development. The state employs the concept of triage, which is "the obsolescence of those one is indifferent to," to eliminate the Gonds from its path of progress.

The other idea of development can be understood in terms of knowledge and its development, particularly as it relates to the Gond people. The kind of gardening that Korok and his father practise can be understood as an intimate knowledge of nature. It is not about cataloguing, categorising, naming, dividing, dissecting, etc., methods that are conventionally associated with modern science. This is not the idea of gardening that emerges from the text. Korok, in fact, at one moment, says, I don't know the names of these plants, but just by feeling these leaves or flowers, I can tell the difference between them. Gardening, in the hands of Korok and his father, quite literally, is an enterprise premised on caring about plants rather than categorising them and making a catalogue out of them. The latter has been a prevalent practice during the colonial period in the Indian subcontinent and remains the primary method of generating scientific knowledge. Thus, the development of knowledge by tribals is not easily or immediately quantifiable, since it cannot be understood in terms of the number of entries in a register or in terms of the discovery of "new" species of plants. In fact, Korok is not even familiar with the idea of discovering a plant because, for the Gond community, hills and nature are not to be read and understood but to be revered, worshipped and used for sustenance. However, the DFO (District Forest Officer), on whose garden Korok works, comes back from Delhi and tells Korok, "a group of scientists have thanked them for cultivating these rare species".[5] In Korok's worldview, the importance of nature in general and a plant in particular is not tied to its rarity or utility. For him and the Gonds, nature and plants are important because they sustain

[5] Sarma 2018, p. 43.

them, in this case not just materially but also affectively. Thus, the Gonds also cultivate and, to some extent, tame nature, but they do so neither to generate new knowledge nor to discover new applications of knowledge. On the contrary, mining, as an activity, is inherently tied to the idea of violence. While gardening also involves "digging", digging and mining are two different ways of treating the land, representing two different ideas of development.

6. *The Redistribution-Recognition Paradigm*

Korok, upon his initial encounter with government officials taking measurements around the hills, is informed that their project will create jobs for the Gonds, who are in dire need of employment. Korok desperately needs a job, especially after his father's arrest, which prompts him to take on work in the garden. However, the underlying assumptions of this job opportunity for Gonds by the government are twofold: one, that Gonds will take up any job that comes their way without any consideration whatsoever; two, survival, for Gonds, is likened to participating in a market economy. The latter establishes and testifies to the dichotomy between gardening and mining: the former signifies sustenance, while the latter signifies survival in the market economy.

From the perspective of the nation-state, the Gonds will be recognised as productive citizens only when they become a part of the market economy. Similarly, their knowledge will be considered legitimate only when it is used to facilitate state-sponsored research. The novel exemplifies this by quoting the example where DFO sends a sample of a rare plant species cultivated by Korok. Its rarity and thus its importance are both determined by the scientists in Delhi. This presents an exchange paradigm: Gonds will have to part with their land to gain access to jobs, and will have to actively contribute to "national" development in order to be recognised as productive citizens of the state. Otherwise, the state perceives them as people who are "jobless" and thus a nuisance. It brands them as smugglers involved in illegal activities. Their recognition is contingent upon their ability to generate profits that contribute to national development and economic growth. Importantly, mining activity is not conducted directly by the government but is leased out to an MNC, which then partici-

pates in the generation of profits for itself and the state. The Gonds are assured that the mining will enable a redistribution of resources since it will provide them with jobs and money that they desperately need. The inclusion of MNCs in the development process highlights the ways in which national development is increasingly shaped by an international market economy within a globalised world order. Science and technology become intrinsic parts of developing (through technologies like ICT) and sustaining (through the flow of capital across nation-states) this globalised world order.

Thus, the idea of development is sold as a redistributive measure of justice, which will allow for optimum utilisation of hills as bauxite reserves, and the resource produced as a result of this process will lead to development for all. The government sells its model of development as not only the most optimal but also as the most 'just'. However, the Gonds realise that this model of redistribution is primarily for the benefit of the state and the MNC, which leads them to demand voting rights to decide on matters concerning their land and resources. The court's decision to grant voting rights to Gonds presents an example of recognition of Gonds as a community that is the rightful resident of those hills and has a say in what happens there. The recognition bestowed by the Supreme Court of India can be understood using Fraser's status model of recognition. According to the status model, recognition cannot be understood in terms of "group-specific identity but rather the status of group members as full partners in social interaction"[6]. By allowing Gonds to vote for determining what needs to be done to their hills, the court provides Gonds, what Fraser calls, "the parity of participation", which can be impeded by institutionalised patterns of cultural values. It challenges the dominant narrative, which conceptualises Gonds as lesser human beings who are incapable of determining what is best for them. Thus, Gonds, by being recognised as peers in social life, get to make decisions regarding their material sustenance. It demonstrates how redistributive and recognitional justice are intertwined, and the parity of participation ensures both recognitional and redistributive justice.

[6] See Fraser 2001, p. 24.

7. *Conclusion*

For the nation-state and the MNC, Gond hills represent the bauxite mine and "Property of Government of Odisha" (a state in India where the mine is located). While for the Gonds, the hills are a sacred source of life and livelihood. This presents a sharp contrast between the two knowledge paradigms: while nation-states and MNCs perceive the hills as a profitable resource, the Gond community attributes a sacrosanct value to the hills. According to Vandana Shiva, reductionist science understands the whole as composed of discrete parts and tends to isolate these parts in order to understand the whole, arguing that if one understands the part, one understands the whole. In reducing the hills, with its ecology, flora, and fauna, to bauxite mines, the nation-state puts this philosophy into practice. What one sees is an interplay of capitalist and reductionist use of science to justify the process of redistribution, which apparently ensures the optimal use of these resources.

Ironically, in recognising Gonds as citizens of the state, the state individualises and subsequently isolates the members of the community. Moreover, within its exchange paradigm, it reminds them of their roles and responsibilities towards the state, which include being a productive and law-abiding citizen of the state. This expectation, or imposition, of the state reduces Gonds' lives to survival rather than sustenance, and bondage rather than choice/agency. At one point, the village headman tells Korok, "That's how the sorkor [government] works. It forgets." And then he adds, "Sometimes, Korok, it is best if the sorkor forgets you"[7]. In a world, as Fraser points out, where "'struggle for recognition" is fast becoming the paradigmatic form of political conflict'"[8], the novel, contrarily, shows that for some communities recognition, when understood in terms of uniqueness of identity, can come at the cost of their livelihood, and that some people would prefer to be forgotten rather than being ostracised and obliterated. It is only through the intervention of the court that the Gonds receive the kind of recognition that allows them the right to participate as peers in social life. It presents an alternative which is beyond forgetfulness and obliteration, an alternative which is about participation and justice.

[7] Sarma 2018, p. 33.
[8] See Fraser 1997.

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Extractivism in Global Agri-Food Systems and Agroecological Alternatives

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Abstract

The global agri-food systems are increasingly defined by deep social inequalities and accelerating ecological degradation. This paper examines how these two dimensions intersect through the analytical lens of *extractivism*, understood not merely as resource exploitation but as a structural logic of capitalism. Building upon interdisciplinary research, it argues that extractivist processes extend beyond mining or fossil fuel industries to encompass agricultural production and trade systems. Through historical and contemporary evidence, the paper explores how the industrialization of agriculture – fueled by the privatization of land, the commodification of natural resources, fossil fuels and technological intensification – has generated systemic inequalities and environmental damage. Using the coffee sector as a case study, it demonstrates how ecological extraction and unequal value distribution operate together, reproducing colonial hierarchies within modern markets. Finally, the paper discusses agroecology as a pathway toward socio-ecological transformation, proposing an integrated approach that revalues labor, restores ecosystem functions, and redefines global food relations.

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Keywords: agri-food systems, extractivism, agroecology, socio-ecological systems

1. *Introduction*

Agri-food systems occupy a central position in the contemporary socio-ecological crisis. Industrial agriculture has dramatically increased productivity and global food availability – indeed, total food production has tripled since 1960[1] – but this achievement has come at the cost of environmental degradation, rural depopulation, and growing inequality across and within nations. The sector now contributes roughly 35% of global greenhouse gas emissions, drives biodiversity loss, alters biogeochemical cycles, and consumes over two-thirds of freshwater resources.[2]

This paper situates these dynamics within the broader framework of *extractivism*. Traditionally associated with mining and fossil fuel exploitation, extractivism today extends into agriculture, where soil fertility, biodiversity, and human labor are extracted to sustain global commodity flows. As Svampa and Gudynas have argued, extractivism functions as a systemic pattern of accumulation, reproducing unequal exchanges between core and peripheral economies.[3] The concept provides a useful analytical bridge between environmental and social sciences, revealing how ecological destruction and inequality are co-produced.

Drawing on research from the University of Bologna's Department of Agricultural and Food Sciences and fieldwork in Latin America, this paper explores the extractivist dynamics embedded in agri-food systems. It first traces the historical roots of extractivism in the transition from traditional to industrial agriculture. It then examines its environmental and social dimensions, focusing on the coffee sector as a paradigmatic case. Finally, it outlines the potential for agroecology to overcome extractivist structures and promote equitable sustainability.

2. *Industrial Agriculture and the Logic of Extractivism*

The shift from traditional agriculture to industrial systems represents one of the defining transformations of the modern era. In Europe, this process began with the enclosure of commons and the

[1] FAO 2015; FAO 2023.
[2] Crippa et al. 2021; McGreevy et al. 2022; Rockström et al. 2023.
[3] Gudynas 2023; Svampa 2019.

privatization of land during the seventeenth and eighteenth centuries, establishing the economic and legal foundations for capitalist agriculture[4]. Similar dynamics unfolded in colonial territories, where plantation economies were built upon dispossession and forced labor. The twin processes of land concentration and agricultural intensification laid the groundwork for extractivist agriculture.[5]

Mechanization, synthetic fertilizers, and chemical pesticides – the technological triad of modern agriculture – were introduced in the 20th century as emblems of agricultural modernization. While these innovations restructured agrarian economies and ensured several decades of substantial yield growth, they did so at the expense of ecological integrity and long-term sustainability. By breaking nutrient cycles and externalizing pollution and waste, industrial farming produced what Marx famously described as a *metabolic rift*: the decoupling of human production from natural regeneration.[6] Fertility once replenished through local organic matter began to depend on fossil-based inputs, turning agriculture into an energy-intensive, linear system.

This transformation standardized farming practices globally, regardless of ecological context. High-yield varieties, monocropping, and irrigation expanded production but undermined biodiversity and soil resilience. The resulting economies of scale favored large landowners and agribusiness corporations, marginalizing smallholders. In this sense, the industrial agri-food model mirrors extractivist industries: it extracts surplus from both ecosystems and people while concentrating capital and decision-making power.

3. *Environmental, Economic and Social Dimensions of Extractivist Agriculture*

The environmental costs of industrial agriculture became particularly evident during the twentieth century's Green Revolution. Although yields increased substantially, the expansion of croplands, intensive tillage, and heavy reliance on synthetic fertilizers triggered severe ecological damage. Around 40% of global soils are now degraded, with hotspots reaching 60-70% in northern Europe and the

[4] Moore 2015.
[5] Borras & Franco 2023. See also Fantini 2023.
[6] Foster 1999.

Po Valley. Soil degradation reduces productivity and carbon sequestration capacity, creating a feedback loop of declining fertility and escalating input dependency.

Pesticide and fertilizer overuse has also disrupted nitrogen and phosphorus cycles, contributing to eutrophication, groundwater pollution and degradation of the soil microbiota.[7] Moreover, the expansion of monocultures has accelerated deforestation, particularly in tropical regions producing cash crops like soy, palm oil, and coffee. The cumulative effect of these practices is visible in the overshoot of planetary boundaries: six of the nine biophysical limits identified by the Stockholm Resilience Centre have already been crossed, with an important contribution of the agri-food systems.[8]

Socially, these processes coincide with unprecedented rural restructuring. Over the past two decades, for example, nearly 37% of European farms have disappeared, mostly small-scale ones.[9] The concentration of land ownership reflects global patterns, with a small number of agribusiness corporations controlling access to raw materials, chemical inputs, processing facilities, and the technologies essential for sustaining agri-food production.[10] The resulting inequalities extend across the global value chain: wealthier economies capture profits through processing, branding, and retail, while producers in the Global South face volatile prices, debt, and precarious livelihoods.[11]

4. *Coffee Industry as an Example of Extractivism*

Coffee production offers a clear example of how ecological degradation and social inequality are intertwined within global commodity systems. Cultivated predominantly in tropical and subtropical regions, coffee thrives under specific climatic conditions that also host some of the planet's richest ecosystems. Industrial coffee expansion, however, has come at a steep environmental cost – deforestation, soil

[7] McGreevy et al. 2022.
[8] Rockström et al. 2023.
[9] Eurostat 2022.
[10] IPES-Food 2023.
[11] Fantini, Samoggia, Bonfigli & Quiñones-Ruiz 2025; Ponte 2019; Samoggia & Fantini 2023.

erosion, and contamination of water bodies have been extensively documented.[12] Although the diffusion of sustainable farming practices, such as shade-grown or organic systems, has mitigated part of these impacts, most coffee landscapes continue to experience hydrogeological instability and biodiversity loss.

At the same time, the global coffee market remains profoundly unequal. Despite growing consumer awareness and the proliferation of sustainability labels, value distribution along the supply chain is still extremely skewed. Less than 10% of total coffee value remains in producing countries, and only about 5-7% reaches farmers. Meanwhile, over 60% of value accrues in the high-value-added segments of importing, roasting, and retailing – activities concentrated in Europe and North America.[13]

This imbalance reflects what Daviron and Ponte termed the *coffee paradox*[14]: even as global coffee trade and consumption expand, the share of income retained by producers continues to decline. The liberalization that followed the 1989 collapse of the International Coffee Agreement accelerated this dynamic, eroding price stabilization mechanisms and exposing farmers to extreme volatility.[15]

Recent research confirms the persistence of these asymmetries. Studies reveal that even within cooperative systems, smallholders struggle to cover production costs amid fluctuating international prices.[16] Certification schemes such as Fairtrade or Rainforest Alliance promise fairer outcomes but often fail to deliver substantial benefits: premiums remain minimal, while the bureaucratic and financial burdens of certification are disproportionately high.

Moreover, labor relations within coffee-producing regions reflect broader extractivist tendencies. The economic vulnerability of small producers cascades downward, intensifying labor precarity and exploitation among rural workers[17]. Women, who make up a large share of the agricultural workforce, are particularly affected – often perfor-

[12] Barreto Peixoto et al. 2023.
[13] Miatton & Amado 2020; Panhuysen & Pierrot 2018.
[14] Daviron & Ponte 2005.
[15] International Trade Centre 2021.
[16] Fantini, Samoggia, Bonfigli & Quiñones-Ruiz 2025; Samoggia & Fantini 2023.
[17] Baquero-Melo 2023.

ming unpaid or underpaid labor.[18] The combination of environmental depletion, economic dependency, and social exclusion defines coffee as a quintessential case of green extractivism[19]: a system that appropriates ecological legitimacy through sustainability discourse while maintaining structural inequalities.

5. *Refounding Agri-food Systems*

If extractivism in agriculture is rooted in the substitution of human and ecological functions with fossil energy, then a more sustainable agricultural paradigm – grounded in defossilization and ecological compatibility – must involve more than a mere technological shift. It requires a reorganization of production that re-centers human labor and ecological processes as regenerative forces. Industrial agriculture replaced people and natural cycles with machines and synthetic inputs; reversing this logic entails both an energy transition and a social transformation.

Defossilization, therefore, implies creating new forms of agricultural labor – more people working the land, supported by renewable-powered mechanization and nature-based solutions. Agroecology provides a coherent and integrative framework for this transformation. It constitutes the most comprehensive response to agricultural extractivism, bringing together ecological science, farming practices, and social movements into a transformative paradigm[20]. Unlike industrial agriculture, which remains rooted in reductionist logic – and unlike many alternative farming models that focus solely on technical adjustments without addressing underlying power relations – agroecology explicitly seeks to reconfigure the socio-ecological foundations of food systems.[21]

6. *Agroecology as a Science and Practice*

As a science, agroecology applies ecological principles to the design of agricultural systems: promoting biological diversity to enhance resilience; cycling nutrients through polycultures and integrated crop-

[18] Quiñones-Ruiz & Giraldo-Liévano 2022.
[19] Bruna 2022; Dunlap, Verweijen & Tornel 2024.
[20] Gliessman 2016.
[21] Vandermeer & Perfecto 2017; Wezel et al. 2020.

livestock systems; managing pests through habitat diversity rather than chemical control; and building soil organic matter to improve fertility, water retention, and carbon sequestration.[22]

These principles are not prescriptive recipes but context-specific practices requiring intimate knowledge of local ecology, climate, and social conditions – knowledge typically held by farmers themselves. In this sense, they embody what Santos calls an "*ecology of knowledges*",[23] recognizing diverse knowledge systems as legitimate and complementary rather than subordinating traditional knowledge to scientific expertise. This approach challenges the colonial legacy through which Northern institutions have long defined universally applicable "best practices" irrespective of local appropriateness.

After decades of debate and research, recent empirical evidence shows that agroecological systems can achieve productivity comparable to that of industrial agriculture while providing superior ecosystem services.[24] These findings contest the conventional narrative of industrial agriculture's "efficiency," revealing its dependence on the externalization of ecological and social costs.

7. *Agroecology as a Social and Political Movement*

As a social movement, agroecology is deeply intertwined with struggles for land, autonomy, and food sovereignty. La Vía Campesina – one of the world's largest organizations of small-scale producers and a key advocate of the agroecological paradigm – defines *food sovereignty* as *"the right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems."* This conception aligns with the Declaration of the International Forum for Agroecology,[25] which frames food sovereignty as both a shared banner of struggle for justice and the broader political framework within which agroecology operates. From this perspective, agroecology concerns not only access to food but also democratic control over food systems, directly challenging the corporate food regime that subordinates farmer and community autonomy to market imperatives.

[22] Altieri 1996; Gliessman 2016; Wezel et al. 2020.
[23] Santos 2014.
[24] Romero Antonio et al. 2025; Suárez-Córdoba et al. 2025.
[25] Declaration of the International Forum for Agroecology 2015.

Then, scaling up agroecological systems requires supportive public policies and institutional transformation. Priority interventions include:

1. Redistributive land reform to counter concentration, ensure access, and create conditions for diversified production, reduced dependency, and community-based governance.[26]

2. Public investment in agroecological research and education, reorienting universities and extension services toward farmer-participatory research and supporting horizontal farmer-to-farmer learning networks such as *Campesino-a-Campesino* movements as complementary knowledge infrastructures.[27]

3. Reforming subsidy structures to reward ecological stewardship rather than production volume, redirecting resources from industrial monocultures toward agroecological transition support, including technical assistance, certification costs, and payments for ecosystem services.[28]

4. Protecting diverse seed systems through farmers' rights to save, exchange, and breed seeds, backed by legal frameworks recognizing seeds as common heritage rather than private property, and supporting community seed banks to counter industrial seed regimes enforced by intellectual property laws and corporate consolidation.[29]

5. Establishing territorial food systems that connect agroecological producers with local consumers through public procurement, farmers' markets, and community-supported agriculture, with municipalities catalyzing this through procurement policies prioritizing local, agroecological food for schools, hospitals, and public institutions.[30]

These interventions confront entrenched interests that benefit from the industrial agriculture status quo. Achieving them requires sustained political mobilization that unites rural movements with urban consumers, environmental organizations, and labor unions in broad-based coalitions capable of challenging agribusiness power.[31] Ultimately, the transformative potential of agroecology depends not only on agronomic practices but on building the political capacity to democratize food systems fundamentally.

[26] Fantini 2023.
[27] Kloppenburg 2004; Rosset et al. 2011.
[28] Springmann & Freund 2022.
[29] Springmann & Freund 2022.
[30] Fantini 2022.
[31] Borras & Franco 2023.

8. *Conclusions*

The analysis presented in this paper demonstrates that contemporary agri-food systems embody the logic of extractivism. From soil erosion to labor exploitation, from deforestation to market concentration, the same structural mechanisms recur – capital accumulation through externalization of costs and concentration of value. Industrial agriculture, while historically framed as a triumph of productivity and modernization, has revealed itself as a system dependent on the continual extraction of energy, nutrients, and human labor.

Overcoming this impasse requires rethinking agriculture not merely as an economic sector but as a socio-ecological metabolism – an interface between human societies and nature. Agroecology offers a coherent framework for this transformation, integrating ecological science, local knowledge, and social mobilization into a holistic paradigm of sustainability. A transition toward agroecology, however, cannot be achieved through technical fixes alone. It requires redistributive policies, institutional reform, and democratization of food governance. Equally, it demands the articulation of social movements capable of confronting corporate power and redefining the priorities of agricultural policy around justice, resilience, and care.

In conclusion, dismantling extractivism in agri-food systems is both an ecological necessity and a political imperative. The sustainability of human life on Earth ultimately depends on restoring the metabolic balance between societies and the ecosystems upon which they depend.

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For a medicine of the working class
Investigations in 1970s Italy between health and exploitation

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Abstract

This paper aims to investigate methodologically and content-wise the Italian Journal "Sapere" in the years 1974-1977. Placing the relationship between science and power at the centre of its general interest, the Journal proposed to rearticulate the relationship between theory and praxis in an unprecedented way, giving to work and to those who worked the possibility to elaborate their own discourse and, with it, effective practices to act concretely in reality and in the workplace.

The journal's methodological approach was based on rejecting the notion of science as a metastructural, neutral and impartial reality. Instead, it was essential to expose the partiality of scientific knowledge and situate it within the socio-historical context from which it arises. This approach applied especially to medical knowledge, which often tends to objectify illness, detaching it from its broader context.

In particular, the aim will be to examine the theme of health and medical knowledge, providing concrete examples of investigation and intervention in factories with the highest levels of harmfulness and of work-related pathologies. The fight for health, which involved the entire mode of production, was linked to the fight against exploitation focusing on the theme of prevention as active intervention, promotion and protection of health, environment modification and work reorganization.

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Keywords: Sapere, health, prevention, class struggle, exploitation

1. *Introduction. The Journal Sapere*

Giulio Alfredo Maccacaro (1924-1977) was one of the leading figures in the transformation that reshaped science and medicine in Italy during the 1960s and 1970s. A partisan, physician, and scientist, he served as director of the Institute of Biometry and Medical Statistics in the Faculty of Medicine at the University of Milan, and was the first to introduce epidemiology in Italy, founding the journal *Epidemiologia e Prevenzione*. Maccacaro made a significant contribution to redefining how science should be understood and practiced, rethinking its role, status, tools, and aims. One of the central arenas for this rethinking was the journal *Sapere*, which he directed from 1974 to 1976[1].

The journal Sapere, serving as an observatory on the relationship between science and power, succeeded in articulating in an original way the connection between theory and praxis, both methodologically and in terms of content. The theme of prevention was central to both Maccacaro's work and the editorial mission of *Sapere*.

Prevention, in fact, when linked to class struggle, became one of the key mechanisms through which workplaces and working environments could be transformed to promote and safeguard health. It is no coincidence that Maccacaro also founded *Medicina Democratica*, a health activism movement that, in 1970s Italy, was part of broader debates and campaigns leading to the establishment of the National Health Service, as well as struggles for working-class rights and for the liberation of psychiatric patients from institutional segregation – most notably associated with Franco Basaglia and the *Psichiatria Democratica* movement.

Within a few years, under Maccacaro's direction, *Sapere* became the most significant political journal on science, addressing themes such as energy, workplace-related cancer, water-related issues, and more. The essence of the entire project is encapsulated in Maccacaro's own words:

> […] l'iniziativa si concentra su un solo tema: scienza e potere. Il potere costituito dal capitale e il potere rivendicato dal lavoro. La scienza come fattore di moltiplicazione del primo e come fattore di

[1] See Maccacaro 2025.

> liberazione del secondo: dunque non opera di divulgazione di scienza, ma opera scientifica, cioè fondata sull'analisi dell'esperienza delle masse […].[2]

The most distinguished voices of Italian critical thought converged around this project: from Franco Basaglia in psychiatry to Giorgio Bert in medicine and Marcello Cini in physics.

The guiding thread of the journal was the firm denunciation of the distorted way of understanding science as a reality alien to the history of social relations of production, and as a body of knowledge that would hinder individual and collective awareness. On the contrary, it was a matter of denouncing the idea of the neutrality of science and the partiality of a knowledge "of capital"[3] to restore to those who worked and died for the science of capital the possibility of developing their own discourse and, with it, concrete practices for acting within reality.

It is precisely from a methodological and content-based perspective that the journal took shape as a genuine observatory on the relationship between science and power. *Sapere* articulated the theory-practice nexus in a novel way, employing collective investigations that engaged workers as co-producers of knowledge – an approach that, in itself, had the capacity to initiate processes of social transformation.

Science and power held a dual, contrasting significance. On one side, the power constituted by capital; on the other, the power claimed by labour. On one hand, science as a multiplier of capital; on the other, science as an instrument of labour's liberation. Methodologically and in terms of content, the journal aimed to rearticulate the relationship between theory and practice in a novel way, offering, or even for the first time enabling, those working and those dying from the science of capital, the possibility to create their own discourse and, through it, to enact concrete practices to impact within reality and the workplace.[4] The entire journal, therefore, was dedicated to scien-

[2] "[…] the initiative focuses on a single theme: science and power. The power constituted by capital and the power claimed by labour. Science as a factor of multiplication of the former and as a factor of liberation of the latter: therefore, not an activity of popularizing science, but a scientific one – that is, founded on the analysis of the experience of the masses […]." Maccacaro 1977a, p. 2.

[3] Maccacaro 1972, in Polack 1972, pp. XII-XIII.

[4] See Maccacaro 1977a, pp. 2-3.

tific work: analysing the experience of the masses by, in Maccacaro's words, giving voice to "those who die from science and those who, knowingly or unknowingly, make others die from science".

The journal's goal was both theoretical and practical: to understand the social context and intervene within it. To achieve this, the journal sought to dismantle the compartmentalization of knowledge, facilitating interaction between technicians – those who practiced or knew science – and the workers, who suffered from the science and knowledge of others yet experienced it directly. In this sense, language held great importance in the journal: it needed to be accessible to everyone. It was necessary to give voice not only to the investigator but also to the investigated. The language used should no longer separate or objectify the "objectified human" and the "scientist human".[5]

It was, therefore, a matter of speaking out as a historical subject for political and epistemological overturning. Only in this way would it be possible to produce an alternative knowledge in which workers were not passive objects of observation, but active subjects and co-producers of knowledge.[6]

To carry out such an operation – one that would unite theory and practice – required a methodological approach grounded in the rejection of science as a meta-structural reality, as something seemingly neutral, objective, and impartial. Instead, the aim was to expose its partiality, bringing it back to its historical dimension, since, as one 1977 article states, "science is a dimension of history", and there is not, nor can there be, a science autonomous from history.

Thus, the journal sought to both present itself as a moment of historical analysis of established science and to conduct prospective research into a new science, one belonging to those who had died from it. This was a science from a working-class perspective. Within this broader framework, medical knowledge played a central role. The

[5] Maccacaro 1977a, p. 4.

[6] In this sense, Maccacaro referred to Michel Foucault's "right to discourse" in a talk given in Chianciano in 1973, during a conference on Science and Power, later published in issue no. 798 of the journal Sapere in March 1977: "[…] come dice Foucault, ciò per cui ci si batte è […] il diritto di discorso, che è affermazione di soggettività. Ed è proprio affermando l'unicità della sua scienza e la scientificità del suo discorso che il potere borghese ha cercato di imporre il suo comando, negare l'altrui diritto. Allora […] il compito dello scienziato che vuole riscattarsi da quel comando e battersi per quel diritto è proprio questo: scoprire a sé e agli altri la determinazione della sua non unica scienza, restituire a chi ne fu escluso la possibilità della sua rifondazione." Maccacaro 1977b, pp. 6-10.

themes of health and medicine were approached from multiple perspectives, all developed in direct connection with workplaces, where the struggle for health had to go hand-in-hand with the struggle against exploitation, as they were intertwined.

2. *Medicine and power*

The key concept around which the journal's commitment to health revolved was that of prevention. A primary point was to challenge the traditional medical notion of disease, questioning the objectivity of disease as something abstracted from its historical and social context. In traditional medicine, which was capital's medicine, there existed a set of objective criteria for verifying the presence of disease. This set of criteria defined what was and was not a disease and constituted the medical knowledge of which the healthcare provider held sole and undisputed authority.

In traditional medicine, disease was conceived as something separate from the patient, an independent entity. Between doctor and patient, an analytical, not dialectical, relationship formed, in which the patient merely lent their body as a passive support in the doctor-disease relationship. This abstraction of disease from its social context was further aggravated by the distance between the education of the doctor and that of the patient.[7]

In a July 1975 article by Giorgio Bert titled *Quale medicina e per chi?* ('Which Medicine and for Whom?'), the gap between the doctor, who is trained outside the world in academic halls, and the patient, who is shaped by the world – in neighbourhoods, factories, fields, villages – becomes apparent. Disease appears as the final outcome of a long chain of causes primarily tied to the individual's life and environment. Therefore, it is a historical, contingent disease, modifiable in its causes. Capital's medicine, which is primarily curative, produces a doctor who merely treats disease, acting as a "public order guarantor". Curative medicine is symptom-focused and does not seek to eliminate real causes. In contrast, eliminating real causes would require a political act, a radical transformation of the conditions and environments where diseases emerge.[8]

[7] Maccacaro 1976, pp. 2-5.
[8] Bert 1975, p. 17.

Bert writes:

> Poiché la malattia fa parte integrante del malato e del suo ambiente psicologico, familiare e sociale, è ovvio che il medico non potrà mai da solo, interpretarla correttamente. Men che meno potrà, da solo, eliminarne la causa: ciò implica infatti la trasformazione totale delle condizioni di vita e dell'ambiente. Tale trasformazione può essere operata solo dalle classi sociali subalterne, che più delle altre subiscono gli eventi che generano malattia.[9]

This transformation must take place in workplaces and can only be achieved alongside the subordinate social classes, who are most affected by the events that generate illness. Therefore, disease must be managed collectively and democratically, and the learning of medicine should primarily occur where "disease is created, that is, in contact with social reality, in neighbourhoods, in the fields". The doctor should work with patients, not on patients.[10]

Against capital's medicine, which conceives "health as a byproduct of profit", the journal set out to deconstruct and demystify the notion of disease as configured by capitalism, to elaborate an alternative medicine that reclaims its active, transformative, and political role in opposition to the capitalist mode of production and the knowledge systems that sustain it, and to shape a democratic management of health, one that would not deprive the patient of comprehension and, consequently, of control over medical reasoning.

While capital's medicine transformed what was social sickness into private, individual discomfort, preventive medicine would instead promote a collective stance against the conditions where disease arises: institutions, living and working environments, social class, and so on. Therefore, the task was to resemanticize the very notion of "prevention". Preventive medicine in what sense? Not merely as early diagnosis through the reading of existing signs, but as active promotion and protection of health. This conceptual reversal was not only

[9] "Since illness is an integral part of the patient and of their psychological, family, and social environment, it is obvious that the doctor alone can never interpret it correctly. Even less can the doctor, on their own, eliminate its cause: this would require a total transformation of living conditions and of the environment. Such transformation can be carried out only by the subordinate social classes, who more than others suffer the events that generate illness." Bert 1975, p. 17.

[10] Bert 1975, p. 18. See Oddone 1976, p. 39.

intellectual but also political and social: prevention as health promotion implies moving beyond the individual realm and into the social, life and work domains of humans.[11]

All of *Sapere*'s investigations and interventions in workplaces aimed to establish this kind of prevention, becoming an active force not only for workers' health but also for their fight against exploitation. A 1976 article raised the question: "Should prevention aim to avoid diseases and thus prevent the impact between harmful agents and the human body, or should it simply aim to prevent disease from reaching its peak, attacking it early in its development?"[12]

This was no trivial issue; it was a moment of "class struggle", taking place on the battleground of human health. The working class, dying in factories from work and exploitation, must take prevention into its own hands, "not only as a tool for defending health… but also for overthrowing ethical values, placing humans above money and life above profit"[13]. The fight for preventive medicine was one of the journal's intervention lines, accompanied by a re-evaluation of disease as a social and class issue. The centrality of the fight for health became evident in the class struggle, especially in factories.

3. *The Seveso Case*

A concrete example emblematic of the journal's work approach and the intertwining of health and exploitation was the Seveso disaster. In July 1976, near Milan, a chemical factory (ICMESA) released a dioxin cloud due to a safety valve failure, with immediate and long-

[11] The monographic issue of Sapere from September 1976 revolves around the concept of "prevention," opened by an article by Giulio Maccacaro entitled "Vera e falsa prevenzione" ("True and False Prevention"): "To prevent, to treat, to heal […]. One prevents a disease, treats an illness, heals from an infirmity. But this is a restrictive sense […] because it directs attention toward the pathological, distracting it from the healthy, and tends to confine both within the individual sphere, separating them from the social. Two operations […] on which it is useful to reflect beforehand. The first leads one to consider as healthy all those who are not ill, as well as some of the sick who do not know they are healthy. It is equivalent to the assertion […] of the objectivity of disease: which exists as such just as there exist objective criteria that make it possible to verify or refute its existence; the sum of these criteria defines medical knowledge, of which, therefore, the healthcare professional is the undisputed and exclusive holder […]." Maccacaro 1976, p. 2.

[12] Gaglio 1976, pp. 28-32.

[13] Aa.Vv. 1975, pp. 34-35.

term consequences for animals, workers, and residents. Workers began investigating on their own to understand the effects of the dioxin cloud, as factory owners provided no answers. *Sapere* documented the event step by step, also through active participation of workers.

Regarding the Seveso case, the journal's work unfolded in multiple ways. On one hand, there was a "popularizing" and scientific effort, clearly evident in many articles written by specialists, devoted to explaining the preparation of Trichlorophenol (TCF), its toxicity, the effects of dioxin, and the accidents and disasters caused by chlorodioxins. On the other hand, alongside this more strictly scientific and divulgative work, the journal also collected testimonies from those who had suffered immediate harm to their bodies and health, and denounced the measures that had been implemented – or had failed to be implemented – immediately in terms of healthcare and institutional response: measures that were ineffective, delayed, and problematic.

The toxicity of dioxin, until that moment a private matter between the "owner" and his neighbors, became a public issue, thanks in large part to the work of Sapere, and turned into a demand for accurate health information as well as an awareness of the toxicity and harmfulness present in factories. Alongside this came an important contribution in epidemiological terms. The "positive" consequence of the disaster, in fact, was a rethinking of epidemiology for ecotoxicological catastrophes: no longer, or not only, the "science of what has happened" or "research to describe and quantify the damage", but the forecasting of "certain events" and the identification of "measures to prevent them".[14]

Seveso thus became a veritable laboratory for studying all the "Seveso cases". In Seveso, the effects of capitalist "knowledge" and "power" converge. The ideological distortion underlying the idea of nature and of environment, no less than that of health, is concretely reflected on the bodies of men and women, as well as on the body of the environment. It is the exemplification of the relations and implications between the capitalist use of territory, the destruction of the natural habitat, and the production of maximum harmfulness within the factory, which have as their effect the minimal safety for the health of workers and inhabitants of industrial areas, as well as the maximum depletion of health and the environment[15].

[14] Tognoni 1982, p. 18.

[15] See Aa.Vv. 1977, pp. 24-27; Aa.Vv. 1978, pp. 2-20; Aa.Vv. 1982.

Alongside investigations into carcinogens and chemical hazards, the journal also explored more everyday issues, such as fatigue, the microclimate in workplaces (lighting, vibrations, noise), and questioned the so-called "human factor" in workplace accidents. Traditional medicine attributed accidents to technical causes or abnormal worker behaviour, even suggesting a "predisposition to accidents" as if it were innate and irreversible. The journal debunked the "human factor", using questionnaires with informed workers and collaborative work between occupational doctors and factory councils to identify the true causes of accidents in work organization or safety failures.

Another significant investigation by the journal was a special issue on the effects of noise, a subject still underexplored today. It denounced ineffective measurement tools and the lack of safety measures against constant or impulsive noise, harming health within and outside the factory. However, the goal of investigations and questionnaires was not merely to expose harmful work conditions but to demand their removal. This required addressing two problems: proposing alternative development paths and understanding how work and its restructuring would impact the workers' psychological and social lives.

The methodology applied by *Sapere* was notable. These were essentially militant investigations, drawing on Romano Alquati's "co-research" (*conricerca*) method – a collective, participatory investigation involving workers as co-producers of knowledge. Inspired by Mario Tronti's "Workers and Capital", *Sapere* adopted the practice of a specific viewpoint (that of the workers), granting it political and epistemological weight, accessing knowledge levels otherwise unattainable.

It is precisely the practice of adopting a specific viewpoint that enables a theoretical-practical rearticulation of the struggle, tailored to specific contexts where demands for health and democratic control over medicine intersected with struggles against exploitation. Investigations fostered knowledge exchange among technicians, workers and unions, transforming knowledge into action, claims, and bargaining through union platforms, building a working-class subject aware of the production processes and the harmful risks that need elimination.

Attention to the production process and to the functioning of the machines was particularly significant. This horizontal exchange of knowledge enabled both theoretical and practical empowerment of claims. It was theoretically relevant as well: from contingent inve-

stigations into concrete cases, scientific evolution was recognized in its full ambiguity – a tool of emancipation for humanity, but at the same time a generator of alienation, especially in the workplace through technology. In conclusion, *Sapere* represents a reconfiguration of the relationship between science and power, and between theory and practice, which could still provide useful methodological tools for investigating workplace health risks and for understanding labour in its old and new, multifaceted forms.

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Of Mice and Men[1]
Critique of the Concept of "Ecology" in the Journal *Sapere* (1974-1975)

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Abstract

The contribution examines the first year of *Sapere* (1974-1975) under Giulio Maccacaro's editorial direction, focusing on how the journal developed a distinctive method for analyzing and politicizing ecological discourse. The study reconstructs how – drawing on a workerist methodological framework, namely the intertwining of critique, inquiry, and co-research – Sapere applied a twofold strategy: a *pars destruens* aimed at demystifying the presumed neutrality of scientific knowledge, and a *pars construens* directed toward identifying sites of struggle and practices capable of generating an alternative, class-based ecological science. Through a close reading of the "Environment and Power" inserts, the article shows how the journal exposed the ideological construction of key concepts such as "nature" and "ecology," revealing their function in masking the material roots of environmental exploitation within capitalist production . At the same time, *Sapere* highlighted emerging forms of democratic environmental management, particularly those developed through workers' inquiries and trade-union initiatives, which offered concrete models of "alternative ecology" grounded in collective participation and preventive planning. The study argues that *Sapere*'s dual methodological movement opened conceptual and political spaces for rethinking ecological policy as a terrain of class struggle and for envisioning transformative practices of knowledge and praxis.

[1] The title of the present contribution echoes the title of Steinbeck's famous novel, which in turn is referenced in the title of an article by Ettore Tibaldi published in *Sapere* in 1974 – *Uomini e Topi* [Men and Mice], an article that will serve as a key point of reference in reconstructing the themes addressed here (see Tibaldi 1974).

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Keywords: *Sapere*, Ecology, Nature, Power, Environment.

1. *Introduction*

In his well-known essay *On the Capitalist Use of Machines in Neo-Capitalism* (1961), Raniero Panzieri writes that, "with regard to technological 'rationality', the task of revolutionary action is to 'understand' it – not in order to acknowledge and celebrate it, but in order to subject it to a new use: to the socialist use of machines".[2] When Giulio Maccacaro took over the editorial direction of the journal *Sapere* at the end of 1973, he seems to have had these programmatic words of Panzieri in mind. They represent the other side of the methodological framework to which Maccacaro would explicitly refer: namely, the intertwining of "inquiry" (*inchiesta*) and "co-research" (*conricerca*) theorized by Panzieri himself. The *pars destruens* of the methodology inherited from the proto-workerist discourse entailed a radical critique of the presumed neutrality of scientific-technological knowledge and the consequent unveiling – beneath its ideological representations – of the materially "situated" character of every scientific discourse. The *pars construens*, by contrast, required an inquiry-based, collective, and participatory investigation that involved scientists "on the workers' side" and the workers themselves as co-producers of knowledge: a "class-based" scientific knowledge aimed at initiating practices of social transformation. Paraphrasing Panzieri, the task was to subject science to a new use – to its socialist use. Needless to say, these two "moments" of the journal's theoretical-practical activity were meant to maintain a synergistic and structurally simultaneous relationship. It was therefore necessary to understand scientific practices, to reveal their ideological dimension and to "subject" them to a new use.

Building on these elements, the present contribution aims to analyze the first year of *Sapere* under Maccacaro's editorial direction, to investigate how the aforementioned methodology was applied

[2] Panzieri 1994, p. 34.

to the specific problem of "ecological science," starting from a close reading of the "Environment and Power" inserts. In this sense, the analysis will consider, first, the ways in which *Sapere* undertook a genetic analysis and critique of the concepts employed by the sciences of capital in addressing ecological issues; and second, how the deconstruction of the ideological character of these concepts was consistently accompanied by an effort to highlight the sites and practices capable of generating new concepts for an alternative, class-based science.

For these reasons, by examining several exemplary articles from the journal's first year, the argument will be structured into three sections, each representing a crucial juncture in *Sapere*'s investigation of the scientific-ideological management of environmental resources. The first section will outline the journal's general methodology and the crucial role of its inserts in general, and of the "Environment and Power" series in particular. The second section will address the *pars destruens* of the discourse on the environment, focused on the critique of the ideological concepts of "nature" and "ecology." The third section, finally, will turn to an example related to the *pars construens* of the discourse, namely through the analysis of articles dedicated to the study of alternative political practices of ecology.

Following this structure, the conclusion will show how the two movements of the method applied by *Sapere* worked synergistically – on the one hand toward the deconstruction of ideological conceptual hypostatizations, and on the other toward the search for theoretical and practical alternatives through an alternative, democratic management of ecological policy.

2. *Discourse on the Method*

After the January 1974 issue – significantly titled "Sapere il Vajont"[3] [Knowing/Understanding the Vajont] – the February 1974 issue, titled "The Energy Crisis", was released, containing the first

[3] It is significant that the first issue produced under the new editorial direction of the journal was devoted to the Vajont disaster. The issue was assembled in the year of the tenth anniversary of the dam's collapse – one of the clearest Italian cases of the ideological management of the environment, carried out through the use of scientific knowledge to legitimize the logic of production and profit. In this case, the most "reassuring" hydrogeological report was deliberately selected in order not to halt, hinder, or slow down the productive process (see AA. VV. *1974a*).

"Environment and Power" insert. In its editorial note, the editorial board introduced the new structure of *Sapere* and wrote:

> The structure of "Sapere" that we are working toward begins to take shape in this issue, and it can be stated immediately: one half devoted to a theme of great significance and substantial relevance; the other concerned with emerging problems from different fields; between the two, an insert open to grassroots experience and discourse […]. The insert – now dedicated to "the environment," as the previous one was to "medicine" and the next will be to "labor," in their relations with "power" – is the space in which we would like to be dispossessed, because those who should occupy it are the subjects of struggle, to whom it intends to offer a weapon, admittedly subtle but perhaps penetrating. This part is therefore – within a journal still entirely to be reinvented and tested – the most experimental one.[4]

The inserts are "independent" sections that do not follow the journal's page numbering, but at the same time function as the theoretical core of the various issues of *Sapere*. They investigate the relationship between "power" and three specific "sites of struggle": labor, medicine, and the environment. In this sense, the inserts serve to target the connections and relationships between power and certain disciplines, with the aim of dismantling the ideological shell that envelops these areas of knowledge. This structure – composed of inserts and thematic articles – illuminates the journal's methodology with respect to the theory–praxis nexus as it relates to the use of science: it is necessary to demystify and deconstruct ideological layers through inquiry, and to search for alternative models of scientific practice in both the present and the past. As noted, the goal is to expose the non-neutrality of science – structurally tied to power – and to open conceptual spaces in which scientific practice can be rethought from a class standpoint. In this sense, the inserts constitute "concrete" *loci*, experimental spaces for the production of "new" knowledge. They are those "spaces," desaturated of ideology, within which it becomes *effectively* possible to rethink and reorganize scientific knowledge from a class-based perspective.

[4] AA. VV. 1974b, p. 3.

In this sense, the "environment"[5] is taken as one of those epistemic spaces, those political battlegrounds that the journal seeks to "occupy" both practically and theoretically. The ideological veneer that conditions scientific reflection on the environment reveals the same problematic attempt of "capital's" knowledge to dissociate itself from the sphere of production and its consequences. Indeed, in relation to potential ecological imbalance, the solution offered by science aligned with capitalist interests is to address the symptom while concealing its material cause. The problem thus lies in a defect of "vision," in an epistemological distortion of scientific knowledge that tends to operate at the level of "circulation," merely allocating in advance the monetary capital required for the palliative resolution of potential "malfunctions," while strategically obscuring the structural causes – constitutively tied to the capitalist mode of production – of ecological disaster.

To confront this type of problem, which is evidently both epistemological and practical, *Sapere* must apply the two-sided methodology outlined above: on the one hand, a deconstructive and desaturating strategy, aimed at cleaning the filters of scientific knowledge and revealing its ideological character; on the other, an "extractive" strategy which, through inquiry, studies concrete situations and the material conditions of possible change – those class-based practices already at work, in friction with the ideological use of power and of the discourses surrounding science.

3. *Pars destruens: Critique of the Concepts of Nature and Ecology*

Within the "Environment and Power" inserts, the first concept to be subjected to critique is the ideological concept of "nature," to which the various lines of inquiry – including the one directed toward the investigation of workers' health conditions – are tied. From the critique of the concept of "nature" follows a more detailed analysis of "derived" concepts, such as environment and ecology. These inserts

[5] Although the inserts do not follow a hierarchical order but are structurally interconnected, one may observe that – in an ideal geometrization of *Sapere*'s framework – the tense pair labor–power represents the apex of an equilateral triangle, resting on the side formed by the vertices environment–power and medicine–power.

thus constitute the space in which this conceptual constellation is isolated and broken down, revealing its ideological structure, aimed at reproducing processes of environmental exploitation by the science "of capital."

In the editorial opening the first "Environment and Power" insert of February 1974 – whose symbol is a panda (the WWF logo) wearing a gas mask – we read:

> If God wills it, the first ecological mystification has collapsed […] The mere announcement of the energy crisis, intoned by Nixon's orchestra for the greater glory and maximum profit of the multinational corporations, was enough for the great "naturalistic demands," the "global projects," and the "quality of life" to sink immediately into the background. All of this is now a corpse mourned only by the "environmentalists" […] It seems to us that this is the moment for an entirely different discourse about another environment: the one that burns on the skin of those forced to live and work in it, the one that functions as a tool of profit and material for power. Environment as power: this is the theme for which we open a space for a discourse we want to make and, above all, want to hear. Let the experience, suffering, and struggles of those who daily bear as their own the wound and the pain, the sickness and the death of an environment that was once a womb to humanity before capital threatened to make it a tomb – let these speak. Whoever has experience of struggle or inquiry, of intervention and research – aimed, on the environmental terrain, at the destruction of the capitalist system – should know that here they may present it, discuss it, compare it, and connect it with those of others, so that it may become collective consciousness: that today even the "order of nature" is, for the most part, the reflection of the social order. Hence, there can never be an environment friendly to human beings so long as the worst enemy of humanity remains on this earth: a master, private or state.[6]

From this editorial note, the journal's intention becomes immediately clear with respect to what it there called the "environmental plot"[7]

[6] AA.VV., 1974c, p. 1

[7] The title of this section of the editorial appears to allude implicitly to *L'imbroglio ecologico* [*Ecological* Plot] by Dario Paccino, published in 1972 by Einaudi – a volume that brought together the social demands which, beginning in the 1960s, had started to denounce the connection between the capitalist organization of labor, health, workplace harmfulness, and environmental degradation (see Paccino, 1972).

and to the mystification[8] and ideologization "constructed as an alibi for the plunderers of nature and as a lure for the so-called *naturofili* [nature lovers]".[9] These themes are treated in a more systematic manner in the April–May 1974 double issue, titled "Are We Too Many?". In this issue, the key elements of the conceptual constellation previously outlined are targeted. The first movement of the critique consists in highlighting the structurally ideological character of the concept of "nature"; the second – connected and derivative – aims to expose the non-neutral and ideological structure of the concept of "ecology".

In this direction, one of the most interesting articles in the issue is a piece by Franca Ongaro, included in a debate section on the "mythology of motherhood" produced by the capitalist-bourgeois system, and entitled *"When Ideology Defines Nature"*. Ongaro writes:

> The mother–child relationship is a natural one. Yet every scientific interpretation of this relationship seems intent on making it *more natural* or *differently natural*. Science isolates the phenomenon it examines, breaks it down, interprets it, explains it, each time giving it a different meaning that in turn requires different aptitudes, attitudes, and behaviors. The interpretation of the phenomenon overlaps with the phenomenon itself, determining its nature. It is the ideology implicit in the interpretation that *becomes nature*, while the naturalness of the relationship under examination becomes ideology.[10]

Starting from this definition of the reversal between nature and ideology, Ongaro shows how the ideological interpretation and "construction" of the concept of nature has concrete effects on women's lives and on their role in society. Indeed, "it is ideology that defines nature; it is not science that responds to a natural problem or need",[11] and, Ongaro continues, "in a society founded on division in the name of profit, no phenomenon can be natural. Ideologies fun-

[8] In this regard, it is worth recalling a specific section that became a distinctive feature of the "Environment and Power" inserts. This was "Le Perle" ("The Pearls"), a column *"dedicated to the worst statements in the field of environmental sciences, to the most serious mystifications, to the falsehoods that reinforce – in books, journals, and public declarations – the overall fraud perpetrated by those in power against those who do not possess power"* (AA. VV., 1974d, p. 16).

[9] Pacenio, 1974, pp. 13-14.

[10] *Ongaro 1974, p. 86.*

[11] *Ibidem.*

ction to make phenomena differently natural, so that one can respond to the false nature they produce without ever confronting problems in their totality".[12] By playing with the definition of what counts as "nature," Ongaro dismantles the concept as it is constructed and reproduced by ideology and reveals its various layers. In the capitalist-bourgeois society, "nature" is defined according to the logic of profit, so that what is natural becomes *more* – or *differently* – natural. This produces a volatilization of "nature" and its subsequent "reconstruction," an operation that – if one follows Ongaro's argument to its ultimate consequences – makes it impossible to trace a distinction between a "first" and a "second" nature, since it is the social relation itself that decomposes and recomposes the natural.

In the same issue appears an article by Ettore Tibaldi, which ideally represents a development of the problem posed by Ongaro. The article, with its Steinbeck-inspired title *"Men and Mice,"* addresses themes in ethology and makes explicit the link between the ideological core of the concept of nature and that of ecology – that is, of the human–nature relationship. In examining studies of comparative ethology between humans and animals, to respond to the problem raised by an ethology conceived as a supposedly "neutral" science, Ettore Tibaldi writes, in a section entitled *"There Is No Nature to Love":*

> Human beings have no relationship with nature outside of social relations. The love of nature proclaimed by ecological campaigns makes no sense unless one keeps in mind that "the so-called natural limits are continually broken by the combined action of social forces operating on various levels: in modern societies this action is hindered by the form of social organization founded on the mechanism of capitalist accumulation"[13]. It is certain, however, that even in a society without masters it will not be possible to free ourselves from biological limits. But what is equally certain is that the gravest problems facing humanity today (and, on a subjective level, much of human unhappiness) stem from the absurd way in which social relations – and even our biological limits – are managed and exploited.[14]

In this passage, in clear continuity with the themes previously di-

[12] *Ibidem.*
[13] Here Tibaldi is citing Di Siena,1969.
[14] Tibaldi 1974, p. 43.

scussed, Tibaldi discusses the problem of the ideological nature of ecology. In this sense, he establishes the conditions for a crucial insight: if the concept of nature is an ideological one, then the concept of ecology – which necessarily involves the human–nature relationship – is likewise ideological. In other words, since no relation to nature exists outside social relations, both the "biological limits" of human beings (as in the case of motherhood) and the biological limits of animals and the environment are managed and exploited by a specific social relation – namely, the capitalist one. For this reason, the proclamations of ecological campaigns lose their meaning: they represent merely a concept of ecology coined on the basis of a "fictitious" nature whose limits are redefined case by case, depending on planned uses and economic interest. From this perspective, this pair of articles invites us to ask what is concealed behind the concept of ecology (and behind what today reappears under the label of "sustainability") and lays out the theoretical coordinates of the problem of the ideological-political use of ecology that will be taken up in subsequent issues of the journal.

Also, in issue 771 of Sapere (April–May 1974), Luigi Guzzi published an article, "Artificial Oxygenation of Polluted Lakes," which illustrates the *political implications* of the ideology of ecology by highlighting the position and function of the "ecological question" within the logic of production. When Guzzi writes that "the ecology of the filter – that is, of de-pollution – is not real Ecology",[15] he means that, despite the importance of purification measures, "real" ecology must be sought not on the level of remediation but on that of the critique of the production of polluting substances. With his article, Guzzi thus exposes the fact that the political program of environmental management is not preventive but purely palliative. In this sense, the productive system – unable to afford changes to its own productive "modalities" – does not cease to pollute but simply factors environmental remediation costs into its balance sheets, in order to offset the damage and clothe itself in an "ecological" veneer. This issue is taken up again in another article, "Acqua bassa a Genova (cronaca di una calamità

[15] Guzzi 1974, p. 60.

'naturale'[16])",[17] written by the trade-union section of the Faculty of Engineering of the S.N.S. – CGIL, in which it is argued that class struggle must serve as the vehicle for breaking the apparent neutrality of science and scientific practices in the environmental sphere.

4. *Pars construens: Ecological Practices for a Democratic Management of Environmental Policy*

These last themes – opening onto a political solution to the ecological problem – characterizes the second "Environment and Power" insert, published in issue 773 of July 1974. One example is the section "The Factory of Pollution", subtitled *"Which Ecology? A Conference on Alternative Ecology."* It is the report of a public meeting promoted by the Provincial Federation CGIL-CISL-UIL of Pesaro, in collaboration with the R.S.A. and the Tecneco workers. This represents an early example of *co-research*, aimed at bringing to light alternative ecological practices, in which the critical work of demystifying ideological concepts is accompanied by a "positive" proposal for reconfiguring the management of environmental policy in genuinely democratic terms.

Indeed, the aims of the conference are clarified as follows, making explicit the link between the "epistemological" problem tied to the ideological concept of ecology and a new form of environmental politics:

> Verification is indispensable in order to debate, with political forces and with local and regional authorities, the terms of the choices developed by workers through their trade unions concerning the methods and aims of scientific research applied to the environmental sector, to arrive at a democratic conception of "ecological" policy. The themes proposed for discussion are as follows:
>
> a) Demystification of the current concept of ecology;
>
> b) The role of ecology as a moment of productive recovery through the rationalization of resource exploitation, and as an alternative tool to the current economic process based on private consumption;
>
> c) Democratic management of environmental policy.[18]

[16] It is interesting to note the use of inverted commas to signal the ideological nature of the adjective 'natural'. The science of capital calls a disaster 'natural' to evade responsibility; yet the title of the article immediately suggests that the disaster is anything but natural, and should instead be regarded as entirely artificial, since it is caused by the capitalist management of the environment.

[17] See Sezione sindacale 1974, pp. 76-84.

[18] AA. VV. 1974e, p. 3.

This schema also synthesizes, in a certain sense, the methodological approach of the journal *Sapere* referenced above. First (a), it is necessary to expose the way in which the ruling class employs the concept of ecology ideologically; second (b), one must rethink an alternative use of the concept of ecology in contrast to the capitalist-bourgeois economic process; third (c), one must offer a proposal for an alternative ecological political practice. The report includes a remarkably clear analysis of how highly industrialized societies have framed the problem of "ecological breakdown." These societies describe the ecological question as the fundamental problem to be solved for the "survival of the entire planet," and identify as causes of the current environmental situation "in a deliberately indiscriminate manner, demographic growth, natural calamities, and the negligence of the entire community regarding the protection and rational use of environmental resources".[19] This represents a classic ideological strategy aimed at concealing the real, conjunctural, class-based causes of a specific problem by generalizing responsibility and extending it to the entire population – if not to humanity as a whole. In this sense, the report continues:

> By presenting the problem in this way, the ruling class has simultaneously achieved a threefold objective: making all social classes appear equally responsible for the current environmental situation; making them all fear the same future danger; and above all, mobilizing them for a common crusade against those dangers. This has avoided confronting the real root causes, which instead derive from an improper distribution of social goods and from the speculative exploitation of resources. Ecology is thus presented as a neutral terrain upon which all social classes may be united, with only apocalyptic threats of ecological catastrophe being highlighted[20],

while the true culprits and the actual sites of the problem's material genesis are concealed. In other words, this is a genuine "mystification of ecology" that, through a sleight of hand, constantly shifts the problematic terrain, hiding the source of the issue and inevitably neutralizing any political grip on it. One piece of evidence for this is the fact that "the problem of workplace health has never been allowed to

[19] *Ibidem.*
[20] *Ibidem.*

enter ecology. As long as pollutants remained within the workplace environment, the issue attracted little concern […]; but when the pollutant left the factory and affected the urban and natural environment in general, then 'ecological' science was born".[21]

In an article by Alessandro Federici, "Chronicles of Profit Ecology", published in the August–September 1974 issue, we read that "ecology, by now, is good for every use: to sell T-shirts, to advertise mineral water, to make ruthless industrialists appear honest".[22] Although this incipit may appear propagandistic, it clarifies and synthesizes two crucial, interconnected aspects of this trajectory in the first year of *Sapere* and of its early "Environment and Power" inserts. The ideologization of the concept of ecology produces a twofold effect: on the one hand, it conceals massive processes of environmental speculation behind an "ecological" ethical veneer;[23] on the other hand, this ideological saturation of the concept produces a paradoxical – though consequent – emptying of meaning, making the "term" applicable indiscriminately to anything. This latter phenomenon only reinforces the former in a circular fashion, making it difficult to requalify the concept polemically and antagonistically and leaving "the choice of power – to pursue a policy of decontamination rather than of preventing pollution itself"[24] – unchallenged.

This is why it is so crucial to envision a political alternative capable of reappropriating a concept by imparting to it a different orientation – an alternative aimed at the democratic management of environmental policy, which "consists first of all in reaffirming the need for a clear

[21] *Ibidem.*

[22] Federici 1974, p. 73

[23] See, for example, the space devoted to the *"Ecological Fraud: Environment 74",* the exhibition-conference organized by FIAT in Turin in May 1974 (see Federici 1974). For Federici, this represents a paradigmatic example of the private industry's response to the attempt by the public sector to take hold of the ecological question. This case shows just how powerful the productive sector is when it comes to inventing products and strategies, or designing anti-pollution plans: FIAT sought to restore an ecological reputation through an event promoting environmentalist policies. According to the author of the article, it would have been enough to read the *"deceitful"*captions of *Environment 74* to grasp the ideological character of the event, or simply to observe the situation in Turin outside the exhibition halls to understand the environmental damage to the territory to which FIAT itself had contributed.

[24] *AA. VV.1974e, p.4.*

underlying political choice, in which the protagonists are working-class and popular forces, proposing a choice based on social goods rather than profit. It also means implementing a just and preventive planning of land use and of resources".[25]

5. *Conclusion*

The response of the Provincial Federation CGIL-CISL-UIL of Pesaro and the Tecneco workers constitutes an example of a possible, genuinely political model of "alternative ecology"; an example of what has been defined as the *pars construens* of the journal's work. By giving voice to the reports of workers' and trade-union meetings and conferences, *Sapere* carried out something akin to co-research, becoming a platform for communicating the results of inquiries within the factory.

In conclusion, this contribution has shown how, alongside its demystifying effort directed at the concepts of nature, environment, and ecology, the journal *Sapere* consistently paired an effort to reconfigure this conceptual constellation in alternative ways. It did so through inquiries and political proposals emerging from within the Western system itself (such as those of the Provincial Federation CGIL-CISL-UIL of Pesaro), but also through a theoretical search for "alternative ecologies" or alternative concepts of "nature," i. e., for alternative models of the human-environment relationship, bringing into relation different times[26], spaces[27], and experiences of struggle.

It is within this multi-layered investigative practice that *Sapere*'s capacity resides: the capacity to desaturate ideologically saturated concepts and to create spaces of thinkability for alternative practices of knowledge and science – transformative practices. Through this two-sided methodology, at once deconstructive and extractive, the

[25] *Ibidem*.

[26] For example, consider Cristallini's analysis of the human–nature relationship in ancient Egypt and Mesopotamia, which shows how the earliest forms of socio-political organization and their corresponding cosmologies did not separate the natural sphere from the human one, but conceived them within a unified and dynamic order, see Cristallini 1975.

[27] See, for instance, the articles on Vietnam and on the clash between the Western–capitalist ecological model and the Vietnamese one, see Collotti Pischel 1974a; 1974b; Bettini 1974; within a section significantly entitled *'Ecocide in Vietnam'*.

journal opens up the possibility of letting alternatives for knowledge and praxis emerge – or, rather, for a knowledge-as-praxis, grounded in the awareness that practices are always saturated with theory, and that it is through inquiry and historical-material investigation that the conditions are created for the emergence of the unexpected, something that appears in the form of a "radical newness" vis-à-vis the consolidated and ideological uses of knowledge.

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Mathematics in the Anthropocene: A Lesson from History

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Abstract

In this essay, I want to challenge the conception of mathematics as constituting a system of abstract truths that is independent of society. This view on mathematics is still prevalent nowadays – even among Marxists. Instead of enjoying an exceptional epistemological status, consisting of universal and transhistorical ideas and knowledge, I argue that mathematics, too, is historical. It is a specific social practice and carries a political dimension. Two historical narratives are presented here to illustrate and underline this shift in perspective. My aim is to show, firstly, that even mathematical proofs, the epitome of abstract truths that are independent of society, arise from practical experiences, and secondly, that their validity is conditioned by the socio-technical practices widespread at the time. Such a historical materialist and practice-based understanding of mathematics confronts us with the fact that we cannot simply rely on today's mathematics or take it as a given when we aim for a different society. On the contrary, we must recognize the development of another, an ecosocialist mathematics for the Anthropocene as part of the struggle for liberation of humans, animals and nature.

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Keywords: History of mathematics, Anthropocene, Marxism, ecosocialism, practice

1. *Introduction*

> Where do correct ideas come from? Do they drop from the skies? No. Are they innate in the mind? No. They come from social practice, and from it alone.
>
> Mao

> Knowledge begins with practice, and theoretical knowledge is acquired through practice and must then return to practice.
>
> Mao

One does not have to be a Maoist or endorse all aspects of the chairman's philosophy and political theory to appreciate his strong emphasis on practice in the production of ideas and knowledge. A perspective that puts (social) practice at the center becomes particularly crucial when it comes to approaching mathematics nowadays, because it is the field most commonly regarded as consisting of abstract truths. Mathematical ideas and knowledge are almost emblematic of things that are apparently true independent of the society we live in.

Such a conception of mathematics as constituting a realm of universal and transhistorical truths has a tradition even among Marxists. Already in his *Anti-Dühring*, first published in 1877, Friedrich Engels rhetorically asked:

> But are there any truths which are so securely based that any doubt of them seems to us to be tantamount to insanity? That twice two makes four, that the three angles of a triangle are equal to two right angles, that Paris is in France, that a man who gets no food dies of hunger, and so forth? Are there then nevertheless *eternal* truths, final and ultimate truths?[1]

It is quite telling that two of the four examples of "*eternal* truths, final and ultimate truths" Engels refers to stem from the field of mathematics. And even more so is the fact that we still tend to generally agree with this view.

[1] Engels 1947, p. 109, emphasis in the original.

In the light of the Anthropocene, however, such a view on mathematics as consisting of universal ideas and transhistorical knowledge must be challenged. We can no longer conceive of ourselves merely as observing agents describing the world around us – deducing general patterns, formalizing theories or extracting some abstract laws from our minds. Nature's history evolves in interaction with our society, and so does our knowledge about it. Our collective practices as social classes within nature and our reflections upon it actively shape and change our biosphere.

Apart from the object of study that changes historically, even the validity of scientific ideas and knowledge in a given setting is socially conditioned. The specific concepts we use to scientifically explain natural phenomena are shaped by a variety of material and cultural factors. What is the motivation behind approaching a certain question? Who are the kinds of people that are doing the research and whose perspectives are excluded? In which institutional framework does it take place? Science, it has become increasingly acknowledged over the last decades, is indeed historical. Mathematics, however, is often still excluded from these insights. It is seen as the epitome of abstract truths that are independent of society and instead posited as the last stronghold in defense of claims to "*eternal* truths, final and ultimate truths".

In this short essay,[2] I push for a different conception of mathematics that denounces its exceptional epistemological status. By turning to the history of mathematics – relying on two case studies mainly, one of which concerns the mathematical culture(s) in ancient Greece, while the other one focusses on an early modern piece of mathematics – I want to argue that mathematics, too, is historical. It is a specific social practice and carries a political dimension. Such a historical materialist and practice-based understanding of mathematics confronts us with the fact that we cannot simply rely on today's mathematics or take it as a given when we aim for a different society. On the contrary, we must recognize the development of another, an ecosocialist math-

[2] This paper emerged from a presentation given at the conference Marx in the Anthropocene: Capital, Nature, Ecology, Environment, which took place in Venice in March 2025, and has been supported by a Doc.CH grant of the Swiss National Science Foundation for the project "A technician's mathematics? The new social realities and new mathematics of German-speaking technical practitioners around 1600" (no. 218980).

ematics for the Anthropocene as part of the struggle for liberation of humans, animals and nature.

2. *Destroying the Aura of Mathematics*

To characterize the picture of mathematics that is dominant nowadays, I want to borrow the concept of "the aura" of a piece of art from Walter Benjamin, which he defines "as the unique phenomenon of a distance, however close it may be".[3] No copy of the Mona Lisa will ever evoke the same kind of relation of the observer to this object as Leonardo da Vinci's original, which is on display at the Louvre in Paris (Figure 1). Only the unique artefact can lead to an auratic conception. People interact with the painting as if it were more than the immediate material object we see. It is perceived not just as the result of some color being put nicely on a canvas but as transcending human practice.



Figure 1: The aura of the Mona Lisa

In certain aspects, the way we relate to mathematics in our society is analogous to the auratic conception of the Mona Lisa. A calculation scribbled on a paper, a formula written on a blackboard or a mathematical proof reproduced in a scientific journal is not merely seen as the result of a specific human practice. To us, these objects seem to represent more than the material streaks or traces of ink that served as the immediate solution to a concrete problem. They hint at an ac-

[3] Benjamin 1969, p. 222.

cess to some underlying "*eternal* truths, final and ultimate truths". In other words, in our social relation to mathematics, we tend to interact with it not as a human construct, but as an entity that has an existence beyond that. Although its concrete manifestations are not unique, they are fetishized. This is the aura of mathematics (Figure 2).



Figure 2: The aura of mathematics

The history of mathematics is arguably the historical discipline with the strongest inclination to idealism. Mathematical knowledge is still often portrayed as monotonously increasing, driven by individual strokes of genius. Not only does such a point of view come along with the aura of mathematics. As Marxists, we know that this is also a very limited and one might even say bourgeois way of looking at history. As Karl Marx summarized the principles of historical materialism, it is the "mode of production of material life [that] conditions" also the "intellectual life".[4] Ideas and knowledge do not exist in a vacuum. They arise from experiences gathered in material practice taking place within historically specific social relations.

As part of the attempt to overcome the current capitalist social formation, a political perspective must be developed on all its aspects, including mathematics. An auratic conception, however, precisely forecloses such a possibility. What I attempt to do in the following is to show that instead of reproducing its aura, the history of mathematics can also serve as a means to follow Benjamin's dictum and "destroy its aura",[5] thereby allowing us to engage with it politically.

[4] Marx 1970, p. 20f.
[5] Benjamin 1969, p. 223.

3. *The Practical Origin of Mathematical Proofs in Ancient Greece*

It might have been in ancient Greece that the aura of mathematics has historically shown up for the first time. What is peculiar about Greek mathematics is that it included mathematical proofs. In the first book of Euclid's *Elements*, written around 300 BCE, for instance, we find a geometrical demonstration of what is commonly known as the Pythagorean theorem (figure 3):

> Proposition 47.
> …
> Let *ABC* be a right-angled triangle having the angle *BAC* right.
> I say that the square on *BC* equals the sum of the squares on *BA* and *AC*.
> For let there be described on *BC* the square *BDEC*, and on *BA*, *AC* the squares *GB*, *HC*;
> [I, 46]
> through *A* let *AL* be drawn parallel to either *BD* or *CE*, and let *AD*, *FC* be joined.
> …

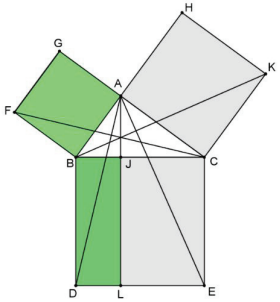

Figure 3: Diagram of the proof of the Pythagorean theorem

> Q.E.D.[6]

Greek mathematical proofs always follow the same structure. They consist of a diagram with letters accompanied by a text that describes the corresponding geometrical construction in a very formulaic and codified style: It avoids numbers and uses very strange conjugations

[6] Euclid 1908, p. 349f.

like "let … be …". Moreover, it frequently refers to preceding common notions, definitions or propositions (like here the preceding one: [I, 46]), giving its reasoning an axiomatic-deductive appearance. The presence of these Euclidean proofs among this culture has not only led many to locate the origin of our modern ways of doing mathematics in ancient Greece. It might also have contributed to the rise of an auratic conception of mathematics.

To understand the historical circumstances that led to the emergence of this specific kind of mathematical practice, I follow a narrative offered by Markus Asper. Underneath the Euclidean mathematical culture that produced proofs, he argues, there was another group of mathematicians. This tradition was much more practically oriented, including people involved in measuring the land, computing volumes or doing pebble arithmetic. From the analysis of the remnants of the practical culture, which deal with concrete numerate problems and their solutions, Asper claims that it was these mathematical practitioners that provided the material from which the Euclidean proofs emerged: "this theoretical knowledge did not suddenly fall from the sky or off the trees, but differentiated itself from the practitioner's knowledge".[7]

As for the motivation to develop and adopt such an alienated style of mathematics – rather than writing like a normal human being in ancient Greece would talk – Asper offers a straightforward answer. The practical treatises were formulated into Euclidean proofs as a form of class distinction. While the mathematicians belonging to the practical culture were mainly part of the lower classes, often being migrant workers, the Euclidean community consisted of a mere handful of aristocratic elites. These were people that owned slaves and had enough spare time to do mathematics. To stay among themselves and not merge with the practitioners that had to make a living with their mathematical knowledge, they constructed their own discourse of mathematics.

The new style of doing mathematics not only kept out the people that were not initiated into it. Euclidean proofs might also have contributed to setting up the aura of mathematics. The abandoning of specific numbers, the use of linguistic tricks, and the choice of unnecessarily complicated proofs of a theorem (if it allowed you to make use of more definitions and prior propositions) made mathematical ideas and knowledge appear more universal and transhistorical.

[7] Asper 2009, p. 132.

Asper's narrative allows us to understand where the auratic conception of mathematics might have come from. At the same time, it shows that even Greek proofs were not just the result of finally finding a way to establish "*eternal* truths, final and ultimate truths". They were part of a specific mathematical discourse that arose from practice and served as a kind of cultural politics from above.

4. *The Astronomical Motivation for the Proof of Prosthaphaeresis*

The Euclidean mathematical practice outlived the specific social setting present in ancient Greece. More than a millennium later, in early modern Europe, we still (or rather again) find an interest in these Greek-style geometrical proofs. The proof of *prosthaphaeresis*, for instance, has been formulated towards the end of the 16th century by the Swiss clockmaker Jost Bürgi. It is a geometrical demonstration of a trigonometric equation that we nowadays refer to as one of the trigonometric product formulas (Figure 4):

$$\sin(\alpha) \times \sin(\beta) = \frac{1}{2}[\cos(\alpha - \beta) - \cos(\alpha + \beta)]$$

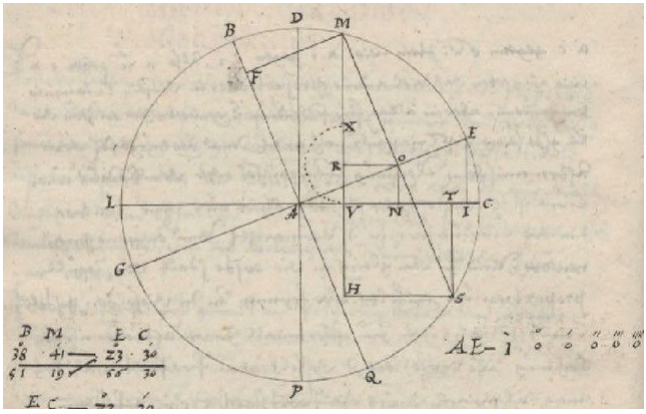

Figure 4: The proof of *prosthaphaeresis* in Bürgi's *Fundamentum Astronomiae* (1592), p. 191.

Here, I will summarize my own analysis of this mathematical proof given in a recent article, where I characterized it as the expression of a "clockmaker's mathematics"[8]. The narrative is two-pronged: On the one hand, I argue that mathematics is not just a disinterested endeavor. Its inquiries arise from problems faced in material practice – astronomical computation in this case. On the other hand, I show that even what can be considered a valid geometrical representation of a mathematical entity evolves with and is shaped by technology. As a result, mathematical proofs must be recognized as being socially conditioned.

We might initially want to ask who Bürgi was, or rather, why he wanted to prove this trigonometric theorem? He was by training not a mathematician at all. Instead, Bürgi comes from a Swiss family of craftsmen and became the princely clockmaker at the court of the landgrave of Hesse-Kassel. As a technical practitioner of the time, he constantly engaged with instruments such as the proportional ruler (Figure 5). His patron William IV was known for his interest in astronomy, which led Bürgi not only to construct his famous planetary clocks as well as precise observational clocks, but also introduced him to astronomical practice.

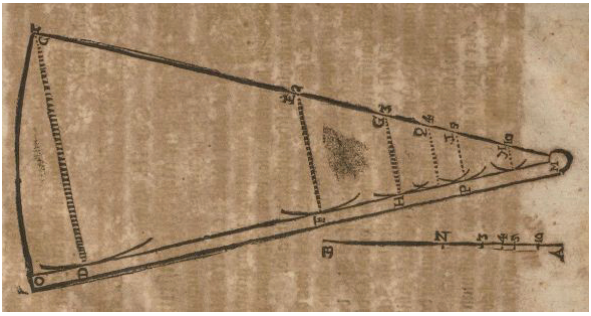

Figure 5: A proportional ruler as drawn in Benjamin Bramer's Beschreibunge und Underricht (1615), p. 60.

Early modern astronomy was closely tied to trigonometry and faced what I call a computational problem. To determine the position of just one object on the celestial sphere, several instances of what is nowadays known as the spherical law of cosines must be solved:

[8] Moosbrugger 2025a.

$$\cos(c) = \cos(a)\cos(b) + \sin(a)\sin(b)\cos(C),$$

where *a*, *b* and *c* denote sides of a spherical triangle with *C* signifying the angle opposite of *c*. Due to the increasing accuracy of observational instruments at that time, the trigonometric values used for the computation were given with many digits.[9] Doing multiplications and divisions by hand thus became extremely tiring and prone to errors.

Some relief to this problem arrived with what is called the method of *prosthaphaeresis*. It is a way to simplify computations by using what in modern notation is equivalent to the trigonometric product formulas (such as the one given above) to substitute multiplications of trigonometric entities by additions and subtractions, thereby making the calculation less tedious. Consequently, the motivation behind giving a geometrical demonstration of *prosthaphaeresis* was that it could serve as a means of justification of the algorithm used to compute numbers in astronomy.

5. *Technology and Mathematics*

Due to its usefulness in contemporary astronomical practice, there were several mathematicians that attempted to formulate a proof of the method of *prosthaphaeresis*. They all seemed to have failed. Sometime during the 1580s, however, the clockmaker Bürgi managed to come up with his proof. But why could he suddenly do it, if nobody else was able to formulate the proof prior to him? How can we explain this situation?

In my article, I take a closer look at the proof of *prosthaphaeresis*. At the core of this proof lies the geometrical representation of the multiplication of two sines. At Bürgi's time, the prevalent notion of the trigonometric entity of the sine was to regard it as a straight line within a circle – the perpendicular to the x-axis corresponding to a specific angle. When it comes to representing the multiplication of two sines, one would thus need to think about something along the lines of a rectangular area in a circle. However, nobody seems to have managed to reach a geometrical proof based on this conception of sine multiplication.

[9] The number of digits used in computation far exceeded the kind of precision that was feasible in practice. As I argue elsewhere, this can be explained by the underlying political ideology of computability; see Moosbrugger 2025b.

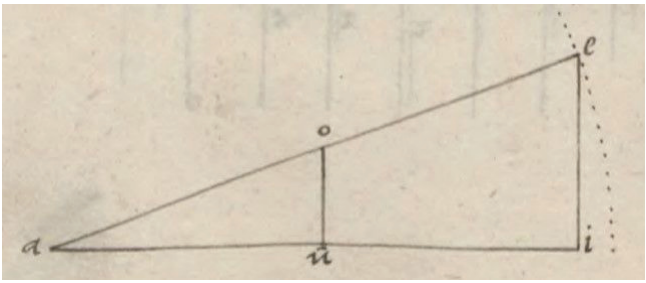

Figure 6: Bürgi's geometrical representation of sine multiplication in his Fundamentum Astronomiae (1592), p. 181.

Bürgi instead came up with a new interpretation of sine multiplication. In short, without going into mathematical technicalities: He treats the effect of multiplication with the second sine value as an act of proportional diminishment (Figure 6). The point is that either the geometrical representation of sines has been underdetermined by its definition when it comes to their multiplication, or that Bürgi goes beyond its boundaries and gives a new interpretation of these entities. The reliance on the new conception of sine multiplication explains how he managed to give a proof of *prosthaphaeresis* and why other mathematicians might not have arrived at it earlier. But where does this new interpretation come from? And why did other mathematicians not come up with it prior to him?

Like Mao or Asper, I argue that new ideas do not just drop from the sky. Knowledge stems from practice. The proportional ruler is based on the exact same principles as Bürgi's interpretation of sine multiplication. Hence, I argue that his new geometrical representation of sine multiplication at the core of his proof emerged from the experience with these kinds of technical artefacts (Figure 7). Hence, the practical engagement with technology must be seen as having inherently shaped his mathematical practice. In other words, one could say that Bürgi did not manage to come up with the proof of *prosthaphaeresis* despite being a clockmaker, but that he could formulate the geometrical demonstration precisely because he was a clockmaker.

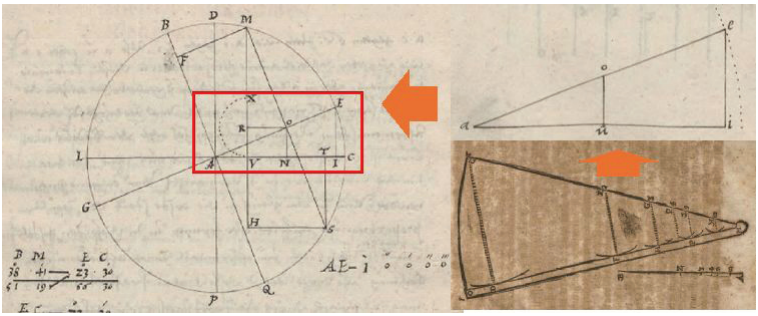

Figure 7: The shaping of Bürgi's mathematical proof by technology

In this perspective, the validity of mathematical proofs, that is, what counts as justified mathematical knowledge, becomes socially conditioned. To make this new geometrical representation an accepted interpretation of sine multiplication, rather than some meaningless streaks on paper, the presence of proportional rulers in the life of technical practitioners might have been crucial. Hence, we see that even these Euclidean-style geometrical proofs do not just provide "*eternal* truths, final and ultimate truths". Instead, they are a historically specific expression of a certain technical and mathematical practice. Technology does not just apply mathematics but can at times become its material embodiment. The means of our social relation to nature and to each other fundamentally shape our "intellectual life".

In consequence, based on such a historical materialist and practice-based perspective on mathematics, we can expect the contemporary proliferation of fields of applications of computational technologies to significantly impact our current mathematical practice. For instance, the role of proofs within mathematics might change drastically. They might even become completely obsolete and disappear. Their function is not to give universal validity to a theorem but instead to act as a tool to advance mathematical knowledge – by breaking down statements into smaller parts allowing them to be challenged on various levels, thereby opening up space for the development of new interpretations, conceptions and entities. Can they still fulfill this role in computerized or even AI-based mathematical practice, when the proof produced by a machine becomes so long that no human will ever be able to study it? We are unexpectedly giving credence to Benjamin's thesis that technological development is challenging the aura, albeit not in the field of aesthetics.

6. *The politicization of mathematics*

To conclude, the attempt of this short excursion was to show that mathematics, too, is historical. Its knowledge arises from practical experience and in the interaction with material reality, technology, and nature. It is nothing superhuman, but just what people do when they do mathematics: a collective human practice situated within specific social relations. The engagement with the history of mathematics can help in the task of destroying its aura, by highlighting its historicity. It can reveal that mathematics does not constitute a universal or transhistorical form of knowledge but instead carries a political dimension – as a form of cultural politics reflecting the perspective of a specific class.

One way to contribute to the spreading of a non-auratic conception of mathematics could thus be to present mathematics in a historical and materialist manner in what Louis Althusser described as "the dominant Ideological State Apparatus in capitalist social formations", that is, "the educational apparatus".[10] In other words, teaching mathematics not as universal and transhistorical ideas and knowledge – the way we have all been introduced to it – but as part of human culture could challenge the aura of mathematics among broader ranks of society.

Once its aura has been destroyed, it becomes possible to approach mathematics politically. It can be analyzed in its concrete manifestations as a social practice with their specific political implications. Where does contemporary mathematical practice contribute to the exploitation and oppression of workers and the destruction and domination of nature? In what ways is it involved in the reproduction of present-day social relations? Where is it geared towards the capitalist development of productive forces? And in what ways does it also challenge or undermine the status quo, by offering visions, conceptions, knowledge and ideas that hint and push beyond the mode of production of capitalism?

One of the few organizations that have been actively doing this kind of concrete analysis of the role of mathematics in our society in the last few years is the Politically Math Action Research Collective. They are a group of people that are in some way or another related to mathematics and share a common concern. In their manifesto, they write:

[10] Althusser 1971, p. 153.

> We feel it is important to understand how mathematics serves and has served as a basis for contributing to industry and State building and in turn how the State, industry, and other forms of organisation make demands – overt and covert – of mathematics.[11]

Such a Marxist approach to mathematics has the potential to open it up as a further field of class struggle. The determinate negation of the capitalist characteristics of contemporary mathematical practices can ignite our imagination of what another mathematics might look like: a mathematics that does not reproduce the given social order with its exploitative and destructive relation to nature, but one that is oriented towards liberation and reconciliation – an ecosocialist mathematics for the Anthropocene.

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[11] Babu 2023, p. 132.

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Can Marxism Reconcile Science and Nature?

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Abstract

Through science, humanity has mediated its relationship with nature in order to understand, exploit, and replicate its forces. The capitalist mode of production continuously exploits nature, and today, more than ever, the consequences of this are becoming evident. Science is not merely a tool for controlling nature but can become an instrument for liberating it because: a) Science enables an understanding of nature, thereby pointing toward new practices that could reconcile humanity with it; b) Karl Marx established a scientific method for analyzing society, aiming to overcome the capitalist framework that shapes it. This presentation aims to connect two interrelated theses that collectively demonstrate the transformative power of science in the human-nature relationship and underscore Marx's significance as a theorist of this potential: 1) The materialist interpretation of modern science supported by Boris Hessen. Science is shaped by technical-economic problems, functions to sustain bourgeois society, and is compelled to view nature as a set of fundamental forms, depriving it of its particularities. Yet it is precisely due to these characteristics that science can influence social development, potentially directing it toward a new human-nature relationship. 2) Throughthe work of Galvano Della Volpe, it is possible to demonstrate the Galileo-Marx analogy, viewing Marx as the founder of a science of society capable of transforming society itself. Rearticulating a new relationship with nature is necessary; doing so through science is fundamental, and in this regard Karl Marx's theories are indispensable.

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Keywords: Boris Hessen, Galvano della Volpe, Science, Nature, Marxism

1. *Introduction*

Can Marxism reconcile Science and Nature? I address this question through a syllogistic approach that requires some premises. These premises are both (a) conceptual and (b) methodological.

2. *Conceptual Premises*

Conceptual premises are necessary when discussing complex elements such as Nature, Society, and Science. It is essential to delineate their respective meanings. This artificial reduction has the limitation of not being general enough to encompass the different theoretical articulations surrounding these three macro-concepts, but it has the merit of highlighting the connection between authors such as Della Volpe and Hessen. This connection allows us to trace within Marxism a science of society that opens the way for a different approach to the human-nature relationship.

For the purposes of this paper:

Society refers to the collective of humans who organize, process, and plan the use and reproduction of resources while developing a transcendental-cultural framework.

Nature encompasses everything that has not yet been processed and can self-reproduce without human intervention.

Science consists of the set of concepts that allow the determination of a future event based on recorded past patterns, established through a system of categories derived from theoretical assumptions.

3. *Methodological Premises*

The methodological premises are tied to the sociogenesis of social interests. In order to maintain a certain analytical coherence, some methodological assumptions are necessary: that humanity's predatory behavior toward Nature has a rational basis, and that individuals are the personifications of social relations – allowing social phenomena to be understood not as the result of individual impulses but as the outcome of interests shaped by the structure of society.

By assuming the sociogenesis of social interests, we can argue that Society has an interest in plundering Nature and that Marxism enables the identification of the social structures that facilitate this interest.

Points (a) and (b) give rise to several issues:

– The reduction of meanings may not accommodate all possible definitions of the macro-concepts in question.

– The assumption of a causal relationship in which society determines its interests (Society → Social Interests) rather than the reverse (Social Interests → Society) may be considered a *petitio principii*.

Other theoretical solutions for rearticulating the Human-Nature relationship – based on different interpretations of the macro-concepts or different perspectives on the relationship between society and its interests – are not to be excluded. However, this paper proposes reconstructing the Science-Nature relationship through Marxism, taking Science as the starting point. To do so, it must demonstrate the following thesis:

If Society has an interest in plundering Nature, and Marxism is a science capable of identifying the social structures that reproduce this interest and designing ways to subvert them, then Marxism is a science capable of undermining the current foundations of the Humanity-Nature relationship.

To support this thesis, two points must be demonstrated:

1. The relationship between Science and Nature is not mediated by social interests, even though social interests play a role in this relationship – Boris Hessen's theoretical framework will be instrumental in this demonstration.

2. Science enables the analysis of society and the design of ways to radically transform its structure, and Marx is the thinker who develops the epistemological tools for Science to do so – Galvano Della Volpe outlines the Galileo-Marx parallel, which serves this demonstration.

4. *Science as a Medium between Nature and Society – Boris Hessen*

Boris Hessen held the chair of physics at Moscow University and participated in the Second International Congress of the History of Science, where he presented a materialist reading of the development of Newtonian physics – correlating technology, economic interests, and science. Hessen's thesis establishes a relationship between Nature, Science, and social interests, but it deconstructs the direct link between Science and social interests by introducing Technology as an inter-

mediary. In his theoretical framework, the relationship follows a sequence: *Technology* ↔ *Social Interests*, while Science serves as a system for understanding Nature that takes inspiration from Technology but remains independent of it, without necessarily sharing its objectives.

The case study Hessen used to demonstrate this argument is modern science, specifically Isaac Newton's *Philosophiae Naturalis Principia Mathematica*. Several materialist thinkers have supported similar theses using different case studies – Grossman, for instance, examined Leonardo da Vinci. Hessen's choice of Newton was based on two fundamental reasons: (1) to debunk the idea of the solitary genius and (2) because Newton formulated a general mathematical method for interpreting the physical world and recognized the connection between concrete problems and their translation into modern physics.

Hessen illustrates his theory by:

– Examining the relationship between the social interests of the 17th century and the issues they generated, which were addressed using modern physics.

– Interpreting Newton's perspective on this relationship, showing how it ultimately led to a shift toward the transcendental domain of scientific theorization, thereby disrupting the direct connection between Science and Technology.

Social interests ✍ Technological Problems ✍ Science

The main social interests – communication, production, and warfare – translated into technological problems (infrastructure, raw material development, ballistics, and weapon performance), which in turn inspired the key scientific questions of the time (fluid dynamics, chemistry, and projectile physics).

Es.

Social interest: The speed of goods transportation:

> The speed of land transport in the 14th century did not exceed five to seven miles a day. Naturally, maritime and water transport played a large role, both because of the greater load-capacity of ships and also because of their greater speed: the largest two-wheeled carts drawn by ten to twelve oxen hardly carried two tons of goods, whereas an average-sized ship could carry up to 600 tons.[1]

[1] Hessen & Grossmann 2009, p. 49.

Technological problem: navigation problems.

> 1. Increasing the tonnage capacity of vessels and their speed. 2. Improving the vessels' buoyancy: greater stability, sea-worthiness, a reduced tendency to rock, greater navigability and ease of manoeuvring, which was especially important for war-vessels. 3. Convenient and reliable means of determining position at sea: means of determining latitude and longitude, magnetic deviation, times of tides. 4. Improving internal waterways and linking them to the sea; building canals and locks.[2]

Scientific questions inspired: Hydrodynamics, hydrostatics, mechanics, and celestial mechanics.

> 1. In order to increase the tonnage capacity of vessels it is necessary to know the fundamental laws governing bodies floating in fluids, since in order to estimate tonnage capacity it is necessary to know the method of estimating a vessel's water displacement. These are problems of hydrostatics. 2. In order to improve the buoyancy of a vessel it is necessary to know the laws governing the motion of bodies in fluids, which is an aspect of the laws governing the motion of bodies in a resistant medium – one of the basic problems of hydrodynamics. The problem of a vessel's roll stability is one of the basic problems of the mechanics of mass points. 3. The problem of determining latitude consists in the observation of celestial bodies, and its solution depends on the existence of optical instruments and a knowledge of the chart of the celestial bodies and their motion – of celestial mechanics. […] 4. The construction of canals and locks demands a knowledge of the basic laws of hydrostatics, the laws governing the efflux of fluids, since it is necessary to calculate water pressure and the speed of its efflux.[3]

Newton was aware of both the scientific debate of his time and the relationship that Hessen identifies between technological problems and society's interests. This is demonstrated by a letter Newton wrote to Aston – a friend of his who was about to travel across several European countries. The list of suggestions Newton provided is extensive (Appendix 1), but it aligns with all the previously identified problems.

[2] *Ivi*, p. 46.
[3] *Ivi*.

About navigation: "To thoroughly study the mechanism of steering and the methods of navigating ships; To find out how the Dutch protected their vessels from worm damage during their voyages to India. To find out whether clocks were of any use in determining longitude during long-distance sea voyages".[4]

The *Principia* address "the basic problems were mechanical ones, this encyclopedic survey of the physical problems amounted to creating a consistent structure of theoretical mechanics which would supply general methods for solving the problems of celestial and terrestrial mechanics. It fell to Newton to carry out this work. The very title of his most important work – Mathematical Principles of Natural Philosophy (1687) – indicates that Newton set himself precisely this work of synthesis"[5]. Newton grasped the plurality of issues within the scientific debate of his time and sought to construct a *transcendental model* that would provide a common language – mathematics – to discuss them. He was aware of social interests and their relationship with technological problems, yet his primary objective was not to analyze this relationship. Newton was one of Hessen's possible case studies, but other thinkers have supported similar theses, focusing on different intellectuals of modernity – Torricelli, Galileo, Bacon, and da Vinci, among others – who contributed to shaping the fundamental epistemic framework of science. What remains central to all of them is the separation of science from social interests.

By disentangling science from social interests, science is freed from being a mere instrument of humanity's domination over nature. If we consider the three terms identified – social interests, technology, and science – where technology serves only as an instrument to satisfy social interests, and science is a transcendental projection concerned with the form rather than the immediate content of reality, it follows that social interests remain the primary factor shaping the current human-nature relationship.

Having demonstrated point (1), the next step is to establish the possibility of understanding Marxism as a science of society, one capable of identifying the correlation between social interests and the structure of society. In doing so, Marxism enables a planned transformation of society, allowing for its reorganization and, consequently, the rearticulation of its interests.

[4] *Ivi*, pp. 57-58.
[5] *Ivi*, p. 56.

5. *Marxism as a Science of Society Aimed at Overcoming Society Galvano Della Volpe*

Galvano Della Volpe was a student of Giovanni Gentile, from whom he distanced himself, initially exploring English empiricism and later developing a materialist epistemology – a theory of science that identifies Galileo and Marx as the architects of science's epistemic framework. Della Volpe's theoretical construction is founded on the establishment of a criterion for the validity of judgments, which determines whether a judgment is true or false. On this basis, he constructs a model that defines science as the tool for understanding the world, asserting that Marxism adheres to scientific standards and enables the formulation of true judgments about social phenomena.

The criterion for the validity of judgments is the *world* itself – reality is true because it manifests, and judgments are true to the extent that they correspond to reality. The subject perceives reality through the senses – "A consciousness without preconceptions or apriorisms must recognize in the sensible and the material the peculiar positive character of singularity or uniqueness, as synonymous with discreteness"[6] – since discreteness is the peculiarity of reality, then: "Not only can the sensible not be reduced to something marginal within the universal [...] but it is so positive, in its specificity, that the universal itself requires it in its positivity: indeed, if a 'name' or concept does not signify a determinate thing, it is as if it signifies nothing at all".[7]

Given this, science is structured around demonstrating that the relationship between reason and matter "must be shown as the very reciprocity or circularity of deduction and induction (in the strict and eminent sense), that is, of idea-hypothesis and data, or law and phenomenon, or cause and effect, however one may term it".[8]

This articulation takes the following form:

Deduction: On the one hand, it operates a *mathematical reduction* of the object; on the other, it establishes the proofof truth in its hypothesis, which therefore becomes a causal law, not by its own force

[6] Della Volpe 1972a, p. 434.
[7] *Ibidem*.
[8] *Ibidem*.

[…] but specifically, it is proven through experiment with the 'model,' which, by providing the disproof and elimination – through a model fact – of other competing facts".[9]

Induction: Observes frequent and tangible accidents, culminating in experiment – understood as a *constructed and functional experience* – "it has just been shown that even the empirical fact or data is either functional, that is, a *fact-type*, or it is not a fact at all, meaning it does not produce effectuality or reality. There is a reciprocal functionality between reason and experience, that is, between predicate and subject, or between synthesis and analysis".[10]

The scientific method consists in correlating deductions and inductions through hypotheses and experiments, thus creating a circuit of theorization that moves from the concrete to the abstract and then back to the concrete, progressively narrowing down the number of causes for a given phenomenon with increasing precision. Just as Galileo was the founder of the aforementioned epistemological framework, Marx establishes a theoretical tool to overcome the difficulty of applying the scientific method to understanding social phenomena. This tool is *determinate abstraction*, which Della Volpe defines using some of Marx's own expressions:

> However, although the 'concrete' is the actual starting point of observation and conception, it still appears in our thought as a 'process of synthesis,' as a 'result' and 'not a starting point.' The concrete is concrete, in fact, because it is a 'combination of many determinations and thus the unity of the multiplicity'... But if, having reached the simplest abstractions, such as labor, the division of labor, demand, exchange value, etc., we 'reverse the journey and return to the population,' and 'this time not as a chaotic notion of a whole, but as a rich unity of many determinations and relations,' that is, understood in its historical development, in doing so we reach the correct method, for which 'abstract definitions (but no longer aprioristic, being based on the continuous "return" to the concrete as such or unity-multiplicity) lead to the reproduction of the concrete through the course of thought.[11]

[9] *Ivi*, pp. 434-435.
[10] *Ivi*, p. 438.
[11] *Ivi*, pp. 456-458.

Determinate abstractions are hypotheses – understood in the manner of Galilean science – i.e., the fundamental theoretical elements that allow the explanation of social phenomena. These abstractions are derived through the process of abstraction from a concrete situation and can be verified in the practical field of economy – reestablishing the circuit of concrete-abstract-concrete (c-a-c).

For this reason, Della Volpe can emphasize that from Galileo to Marx, "research techniques may vary, but there is only one logic: the materialistic logic of modern science",[12] "a logic whose symbol remains the aforementioned concrete-abstract-concrete circle".[13]

Della Volpe thus demonstrates the uniformity of Marxism with science and identifies it as a science of society. But does it also offer the potential to overcome the current society?

> The task arises of developing the Marxian concept, here mentioned, of 'philosophy' as 'science,' indeed as history-science, inasmuch as it is a 'specific conception of a specific object,' and yet critical-revolutionary: a conception that, based on a methodological instance that takes into account the Aristotelian instance (seen above) of the 'medium,' rejecting the Platonic one as merely an assertion of the 'more general' (or modernly understood 'universal' apriorism), presents itself as a critical analytic or descriptive approach that works with working hypotheses, like other 'sciences'; only that its hypotheses, that is, its functional concepts, concern the 'historical' social 'reality,' with its contradictions, and have value (as laws) only insofar as they are verified as revolutionary critique because they are capable of nullifying (being specific knowledge of specific things) the negative, the contradictory, of particular economic-social situations and thereby resolving them.[14]

The scientific process of verifiability – the final point of the concrete-abstract-concrete (c-a-c) cycle – within Marxism as science lies precisely in the revolutionary critique of social structures that can be interpreted through political economy. Marxism, therefore, is the science that allows for the identification of social structures, critiques them through the language of political economy, and revolutionizes their structure.

[12] *Ivi*, p. 469.
[13] *Ivi*, p. 467.
[14] Della Volpe 1972b, pp. 166-167.

By assuming the sociogenesis of social interests, Della Volpe's framework thus functions as a theoretical tool for defining Marxism as the science of society – which identifies the organs of society from which certain interests arise – and emphasizes its revolutionary character – it enables the modification of those organs – thereby addressing the second point to be proven.

6. *Conclusions*

Correlating the theories of Della Volpe and Hessen could become epistemologically fragile unless a shared theoretical background is constructed, as attempted in the premises. Even with such construction, there remains the risk of falling into the fallacy of *Petitio principii*. Overcoming these limitations, which are more or less necessary, allows for the presentation of a defense of the *instrumental character of scientific thought*, deduced through the very form of that *instrumental character*.

Scientific thought not only allows us to understand certain processes in the functioning of nature and recognizes the real necessity of reorganizing the relationship between human and nature, but it also claims the ability to comprehend the architecture and functioning of society. Moreover, it declares itself an active participant in the reconstruction of this relationship. The question that may arise is whether we can trust scientific thought and, more importantly, what its limits are. The answer to the first question is inevitably grounded in the concept of trust – and rationally, it is impossible to identify reasons for *trust* when the trustee adopts a skeptical stance. As for the second question, there can be as many answers as there are ways to define science. Based on the reconstruction presented here, the preferred answer is that science does not act – it identifies, critiques, and plans – but does not take action.

The final question, "Can Marxism reconcile science and nature?" The answer is no. Marxism enables the self-consciousness of science in identifying who opposes nature, critiques how they do so, and allows for the planning of targeted actions to dismantle the predatory structure of the social system. It does not halt all this but offers solutions to achieve it.

> The great historical significance of the method created by Marx lies in the fact that knowledge is not regarded as the passive, contemplative perception of reality, but as the means for actively reconstruc-

> ting it. For the proletariat science is a means and instrument for this reconstruction. That is why we are not afraid to expose the "worldly origin" of science, its close connection to the mode of production of material existence. Only such a conception of science can truly liberate it from those fetters in which it is inevitably trapped in bourgeois class society.[15]

Appendix 1 (Hessen B. (2009), *The Social and Economic roots of Scientific Revolution,* Berlin: Springer, pp. 57-58).

Newton's well-known letter to Francis Aston gives a very clear notion of his broad technical interests. The letter was written in 1669 after he had received his professorship, just as he was finishing the first outline of his theory of gravity.

Newton's young friend, Aston, was about to tour various countries in Europe, and he asked Newton to instruct him how to utilize his journey most rationally and what was especially worthy of attention and study in the European countries.

We will cite a brief summary of Newton's instructions.

To thoroughly study the mechanism of steering and the methods of navigating ships.

To survey carefully all the fortresses he should happen upon, their method of construction, their power of resistance, their defense advantages, and in general to acquaint himself with military organisation.

To study the natural resources of the country, especially the metals and minerals, and also to acquaint himself with the methods of their production and refinement.

To study the methods of obtaining metals from ores.

To find out whether it was true that in Hungary, Slovakia and Bohemia, near the town of Eila or in the Bohemian mountains not far from Silesia, there were rivers whose waters contained gold.

To find out also whether the method of obtaining gold from gold-bearing rivers by amalgamation with mercury was still a secret, or whether it was now generally known.

In Holland a glass-polishing factory had recently been established; he must go to see it.

[15] Hessen & Grossmann 2009, p. 88.

To find out how the Dutch protected their vessels from worm damage during their voyages to India.

To find out whether clocks were of any use in determining longitude during long-distance sea voyages.

The methods of transmuting one metal into another, iron into copper, for instance, or any metal into mercury, were especially worthy of attention and study.

It was said that in Chemnitz31 and in Hungary, where there were gold and silver mines, it was known how to transmute iron into copper by dissolving the iron in vitriol, then boiling the solution, which on cooling yielded copper.

Twenty years previously the acid possessing this noble property had been imported into England. Now it was unobtainable.

It was possible that they preferred to exploit it themselves in order to transmute iron into copper rather than to sell it.

These last instructions, dealing with the problem of transmuting metals, occupy almost half of this extensive letter.

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On the Non-Neutrality of Science in Advanced Capitalism: Radical History and Philosophy of Science in 1970s Italy

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Abstract

This article reconstructs the development of radical history and philosophy of science in 1970s Italy, with a special focus on the magazine *Sapere* as a major forum where scientists and intellectuals elaborated a Marxist critique of the alleged neutrality of science. While part of a broader international movement that challenged the subordination of science to the interests of postwar capitalism, Italian radical scientists formulated a distinctive argument that reflected the broader political and social upheavals of the decade: the contemporary organisation of scientific research conformed to the structure of industrial production in advanced capitalism. Drawing on both historical inquiry and theoretical reflection, contributors to *Sapere* analysed the transformation of scientific activity into a form of productive labour subject to capitalist planning, standardisation, and control. Through this reframing of the relation between expert knowledge and power, scientific researchers and technicians came to be seen as potential political actors and key allies in the anti-capitalist struggles of industrial workers in the post-1968 era.

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Keywords: Non-neutrality of science, Science in advanced capitalism, Radical history of science, Radical philosophy of science, Sapere

1. *Introduction*

This paper reconstructs the development of radical history and philosophy of science in 1970s Italy. As the title of this contribution suggests, the main thrust behind virtually all writings on the subject – a great many of which appeared in the magazine *Sapere* – was the critique of the alleged "neutrality" of science, particularly in relation to social relations of economic production. An earlier, path-breaking attempt at questioning the neutrality of natural science within a Marxist framework had been made by Boris Hessen in his immensely influential paper *The Social and Economic Roots of Newton's 'Principia'*, first presented at the Second International Congress of the History of Science held in London in 1931.[1] The proceedings of the Congress did in fact play a part in shaping the views of Italian radical scientists in the 1970s, yet they did so only belatedly and indirectly. In his foreword to a seminal 1976 collection of critical essays on the subject of scientific neutrality, *The Bee and the Architect*, one of the authors, Marcello Cini, wrote: "Through a British reissue of the talks of the Soviet delegation to the Congress of the History of Science and Technology, held in London in 1931, we actually discovered a current of dialectical materialism… which explicitly and eloquently supported a viewpoint which is very similar to the ones discussed in the present collection of essays. This was very important for us. The volume was entitled *Science at the Crossroads* and was published in 1971; but we only discovered it less than one year ago".[2] In the following pages, the critique of the "neutrality" of science is more accurately placed against the background of workers' struggles in "advanced" capitalism – meaning, essentially, postwar industrial capitalism. Beginning in the mid-to-late 1960s, it will be shown, an informal group of radical scientists on the Far Left of the Italian political spectrum began to draw attention to the function of science in contemporary capitalism, insisting on the role scientists could play in overthrowing it together with manual workers. This line of thinking resulted in a unique strand of radical history and philosophy of science in 1970s Italy and worldwide.

[1] Hessen 1931.
[2] Cini 2024a, pp. 86-87.

2. *The militarisation of science in Cold-War capitalism*

Italian debates on science and society in the 1970s unfolded within a transnational movement of radical scientists. During the Cold War, the entanglement between scientific research and economic interests was epitomised by the "military-industrial complex" denounced by U.S. President Dwight D. Eisenhower in his 1961 farewell address. With U.S. involvement in the Viet Nam War, scientific research increasingly found application in the industrial production of military technology, raising – or, in some cases, intensifying – concerns about the social responsibility of scientists. During this time, the Russell Tribunal was established in 1966 to independently investigate war crimes in Viet Nam. Concurrently, a host of grassroots organisations of radical scientists, such as *Science for the People* in the U.S. or the *British Society for Social Responsibility in Science* in the UK, began to call for a reassessment of scientific priorities in a way that safeguarded independence from the goals imposed by the military-industrial establishment.

In Italy, these global debates intersected with a distinctive strand of left-wing political activism and academic dissent. In 1972, a wave of protests led by students and researchers erupted at scientific events in Erice, Trieste, Varenna, and Cagliari, opposing scientific cooperation with U.S. and Israeli military forces and objecting to the military application of technological innovations in such war theatres as Viet Nam and Lebanon.[3] These issues had already been explored on a more conceptual level by prominent Italian physicist Marcello Cini, a member of the Russell Tribunal as well as of the editorial board of *Sapere*. In a 1969 article, Cini drew on a statement by NASA officials regarding the Apollo programme, according to which the "single goal [of placing an American on the Moon and bringing him back] could not justify the program's huge expense". Instead, NASA argued, the expense could only be justified by "the spinoff of fundamental technology that might be important for future military applications".[4] For Cini, this fact alone was enough to prove that material interests, rather than supposedly neutral research goals, are the driving force in contemporary scientific research. As nuclear physicist Alvin Weinberg

[3] Vitale 1972; Ienna & Turchetti 2023.

[4] As summarized in Haselkorn 1967, p. 3.

wrote in 1964, "If we do space-research because of prestige, then we should ask whether we get more prestige from a man on the Moon than from successful control of the waterlogging problem in Pakistan's Indus Valley Basin. If we do space-research because of its military implications, we ought to say so".[5] According to Cini, there are good reasons why we do *not* say so. Such omission serves a crucial *ideological* function in that it steers the debate away from a critical discussion of the costs, priorities, and impact of scientific research. As Cini put it: "It is a way of abandoning the responsibility for choosing scientific and technological priorities which – instead – would draw nourishment from the needs of human societies, from their material contradictions, from the aim of building new equal, free relationships, not only between men of the same nation".[6]

3. *Scientific production and commodity production*

This line of criticism of the "neutrality" of science did not limit itself to merely unearthing the material and ideological manipulation of research for military purposes. According to its proponents, military appropriation was but one of the many ways in which advanced capitalism availed itself of scientific research for its own self-reproduction. In a separate article written for *Sapere* together with geneticist Luciano Terrenato, Marcello Cini explored in detail how the restructuring of the industrial labour process in postwar capitalism also affected scientific work down to its very internal organisation.[7] This idea had already been expressed in a previous essay by Giovanni Ciccotti, Marcello Cini and Michelangelo de Maria on *The Production of Science in Advanced Capitalist Society*, which was translated into English and included in the 1976 volume *The Political Economy of Science*, edited by Hilary and Steven Rose.[8] Both essays emphasised the increased impact that postwar science had on productivity growth due to a reorganisation of scientific work in large laboratories. With the rise of advanced capitalism in the aftermath of WWII, the authors argued, science increasingly became a process of information produc-

[5] Weinberg 1964, p. 48.
[6] Cini 2024b, p. 302.
[7] Cini & Terrenato 1976.
[8] Ciccotti, Cini & de Maria 1976.

tion akin to commodity production. "The most advanced methods of organisation management", the authors write, "are utilized to maximize the 'productivity' of research".[9]

The extension of the methods of advanced capitalist management to the organisation of scientific labour had manifold consequences. First, increasing specialisation was introduced, breaking down scientific labour into increasingly simple tasks for the sake of maximising productive efficiency. This separation of roles also introduced hierarchical relationships among researchers, condemning their research activity to the alienating rote of merely applying standardised techniques. Second, the need to maximise productivity also made time a crucial factor in scientific production, and competition came to govern research work. Third, the return on investments was further secured by making productivity quantitatively measurable. To quote an instructive passage from the essay: "The necessity of establishing a quantitative criterion by which scientific production can be measured results in a scale which selects those contributions which promise to result in the largest number of further publications. The measure of the success of any published work is determined by the number of citations, and the measure of efficiency of an institution is the number of publications it produces".[10] This prescient observation anticipated the performance-driven constraints that still govern academic research today: "Young researchers are forced, if they do not wish to be rapidly driven out, to publish a lot of fashionable material without time for reflection. The scientific institutions (centres, laboratories, research groups) tend to concentrate equipment and effort in directions which can secure results according to canons which are accepted and defined by the establishment".[11]

However, the emphasis put on the peculiar structure and function of science in postwar capitalism should not lead one to think that earlier science was to be regarded as a "pure" intellectual venture. Quite on the contrary, this line of criticism also encouraged revisiting earlier epochs to demonstrate that science has never been socially neutral. In doing so, contributors to *Sapere* sought not simply to historicise their critique but to demonstrate its systematic character: if the develop-

[9] *Ivi*, p. 51.
[10] *Ivi*, p. 53.
[11] *Ivi*, p. 54.

ment of scientific theories had always been shaped by the surrounding social order, the ideology of neutrality appeared historically untenable. Consequently, a great many issues of the magazine published over the 1970s featured one or more articles devoted to reconstructing some episode or another in the history of science, including pre-industrial and pre-capitalist science. In a two-part article, for instance, ancient cosmology was shown to have developed out of agricultural needs.[12] In another, the emergence of non-Euclidean geometry was accounted for in terms of its superior capacity to address engineering and architectural problems vis-à-vis Euclidean geometry.[13] Yet other articles discussed the development of quantum theory in connection with the German chemical industry.[14] Further debate ensued on the specific factors that favoured the rise of relativity theory amidst the crisis of classical mechanics.[15] Taken together, all these reconstructions – along with others also featured in the magazine – framed science as a social product shaped by material needs. In fact, the history of science as a whole quickly became the chosen field of intellectual inquiry for those radical scientists seeking to corroborate the "non-neutrality" thesis with irrefutable examples.[16] Many of the contributors to *Sapere* would even go on to found a separate – if short-lived – magazine entirely devoted to the radical history of science, *Testi & Contesti*.[17]

4. *Science in perspective*

Not unlike the critique of the militarisation of science, all these considerations on the inherent non-neutrality of science were not merely the product of intellectual reflection. Quite on the contrary, they drew nourishment from a broad front of social movements active in the post-1968 period. In Italy, scientific workers and technicians often became active participants in the 1968 upheaval by opposing the highly hierarchical and competition-driven management of research labs, both in the university and in private companies.[18] An

[12] Cristallini 1975a; Cristallini 1975b.
[13] Marchetti 1976.
[14] Donini & Ciccotti 1975; Baracca & Russo 1976.
[15] Battimelli 1974; Falavigna 1975a; Falavigna 1975b; Donini & Tonietti 1975.
[16] Ienna 2023.
[17] Baracca, Bergia & Del Santo 2017, p. 77.
[18] See, e.g., Lumley 1990, pp. 197-206.

especially significant example of this was the 1969 protest at the International Laboratory of Genetics and Biophysics (LIGB) in Naples. While the institute's connections with U.S. and Israeli military forces were undoubtedly a major target of the protest, its employees also opposed the capitalist organisation of research that characterised it since its inception. The LIGB had been founded in 1962 as an independent centre capable of bypassing university regulations and thereby adopting a U.S.-style lab structure with differentiated salaries and a productivity-focused work environment. The growing demands for a democratisation of its management and for transforming temporary studentships into permanent salaried posts gradually escalated into the occupation of the institute by 82 protestors in May-June 1969, which eventually led to the resignation of its director and to changes in its internal structure before funding cuts significantly hampered the initial project of establishing a research centre of international relevance.[19]

These and other protests enacted by technicians and white-collar – or, quite often, white-coated – workers merged with the more traditional grievances of industrial workers which erupted in Italy's "Hot Autumn" of 1969. The magazine *Sapere* played a pioneering role in unifying these diverse demands within a single theoretical and political framework capable of shedding light on the pivotal role of science in advanced capitalism – under the rubric of the "non-neutrality" of science. Originally founded in the 1930s as a popular science magazine, in the early 1970s *Sapere* became associated with existing social movements organised around the basic needs of the working class, including first and foremost the safeguard of its well-being in the work environment.[20] Such special focus on health and safety issues, too, ought to be understood as part of a wider platform of radical opposition to the scientifically planned exploitation of labour. As *Science for the People* also recognised from the outset, health care was a crucial area where the people's needs could be articulated in a contentious form, as shown by the medical services provided by such political organisations as the Black Panther Party, the Young Lords, the Medical Committee for Human Rights, or the Student Health Organization.[21]

[19] Capocci & Corbellini 2002.
[20] See, e.g., Feltrin & Sacchetto 2021.
[21] Zimmerman et al. 2018, p. 21.

In Italy, the politicisation of health was directly spurred by the demands of the workers' movement which had taken a radical turn after the "Hot Autumn", leading to the exploration of new areas of political intervention. Previously neglected hazardous factors in the workplace, such as the stress-inducing pace of production scheduling or the regular exposure to noise, began to feature more heavily in the grievances voiced by working-class organisations. The Italian environmental movement also has distant roots in the issues raised by the workers' enquiries on the impact of industrial production plants.[22] All this was made possible by an unprecedented cooperation between the scientific expertise of technicians and the first-hand, everyday experience of workers – a cooperation which *Sapere* had put at the centre of its political and editorial line since the early 1970s. Its director at the time, Giulio A. Maccacaro, was a physician by training and a founder, among other things, of Medicina Democratica – Movimento di Lotta per la Salute (*Democratic Medicine – Movement Fighting for Health Care*). Such political work on the medical needs of the working population contributed significantly to accelerating the process that would eventually lead to the establishment of a National Health Service in Italy.[23]

5. *Conclusion*

The insistence on the "non-neutrality" of science in 1970s Italy should not be mistaken for a form of scientific relativism. Even the boldest claims that radical scientists made about the structural homogeneity of scientific and industrial production did not question the validity or rationality of scientific theories themselves. In fact, the authors of the essay on *The Production of Science in Advanced Capitalist Society* stressed that mistrust in the cognitive content of science as such ultimately arises from mistaking societal issues for scientific problems.[24] The critique of scientific neutrality, in other words, targeted the goals and organisation of scientific production rather than its inherent intellectual value. The political consequences that radical scientists drew from this – particularly as regards the application of scientific expertise to such issues as health care – were that science

[22] Feltrin & Sacchetto 2021; Benegiamo et al. 2022.
[23] Giorgi 2023.
[24] Ciccotti, Cini & de Maria 1976.

could be used as much "for" the people as "against" it. On their view, the point was not to "free" or "liberate" science as a "pure" intellectual venture. As *Science for the People* also put it at the time,

> We find the alternatives of 'science for science's sake' and 'science for progress and capitalism' equally unacceptable… Traditional attempts to reform scientific activity, to disentangle it from its more malevolent and vicious applications, have failed. Actions designed to preserve the moral integrity of individuals without addressing themselves to the political and economic system which is at the root of the problem have been ineffective… What is needed now is not liberal reform or withdrawal, but a radical attack, a strategy of opposition. Scientific workers must develop ways to put their skills at the service of the people and against the oppressors.[25]

Yet the editorial board and the contributors of *Sapere* went even further. By situating scientific research within the overarching structure of capitalist production, they conceived of scientists as the mere bearers of specialized expertise – as per the scientistic ideology of advanced capitalism. Instead, they regarded them primarily as intellectual *workers*, whose productive activity placed them on an equal footing with industrial workers. The resulting political strategy involved those high-skilled intellectual workers joining forces with industrial ones in contrasting the converging exploitation of intellectual and manual labour on the part of capitalists. In fact, critics of the neutrality of science accorded a special role to the mobilisation of scientists in building an effective opposition to contemporary capitalism. Precisely because technology played such a crucial role in advanced capitalism, scientists were endowed with the unique power of reorienting its function and putting science at the service of the people rather than of capitalists. This, however, required first and foremost dispelling the enduring ideology of "neutrality" that continued to keep scientists under its spell. Their convergence on the demands of the insurgent industrial class could serve just this function by providing the conditions for imposing new goals on scientific research. In this sense, the non-neutrality thesis pointed beyond analysis: Italian radical scientists envisioned scientists as a potential political subject within, and against, advanced capitalism.

[25] Zimmerman et al. 2018, pp. 20-21.

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Agrobiology and National Sovereignty: USSR, China and Cuba

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Abstract

Ecosocialist theories often connect Marx's ideas with those of his agrochemical contemporaries, notably Liebig. While this foundation is valuable, a deeper understanding of socialist history is needed to move beyond reductionist narratives or "black legends." To grasp Cuba's leadership in agroecology, it is necessary to examine the theoretical links between agronomy and Marxism, as well as the practical need for socialist transitions to develop agrobiological models opposed to agribusiness and agrochemistry. Such models protect soils and local resources as national wealth while addressing environmental and social harms caused by capitalism's predatory logic. Socialist agroforestry in the USSR – especially the "Great Plan for the Transformation of Nature" (1948-1952), based on the work of soil scientist Vassily R. Williams – offers a revealing precedent. Similarly, Cuba's turn toward urban and peri-urban agriculture since the 2000s shows how socialist states have integrated agroecological practices. Studying these cases deepens our understanding of how climate and biodiversity struggles align with movements for national liberation and land socialization. Far from being contradictory, these movements converge in a shared struggle against environmental destruction and imperialist exploitation.

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Keywords: Agroecology, Soviet Union, China, Cuba, Great Plan for the Transformation of Nature

The Western ecological approach often combines a rejection of technological progress with a critique of the national framework, which underpins competitive productivity. Yet, by taking a "step aside," it is possible to shift paradigms. A modern german harrow uses A.I. to quickly tell weeds apart from crops, offering an alternative to chemical products. It requires a significant investment because each crop needs a specific machine. Unlike capitalist farming, which uses the same machines, chemicals and crops regardless of soil, it necessitates technical diversity adapted to the diversity of agroecosystems. It's fair to criticize the dead ends of "technosolutions", but this harrow isn't one of them; it replaces chemicals instead of justifying their use with later "solutions". Moving away from extractivism and agrochemistry needs more science, not less, then more public funding and more human labor.

Western Marxism, as described by Domenico Losurdo, faces a key ecosocialist issue: how socialism relates to science. The Western left, influenced by postmodernism, sometimes questions scientific and technological progress. As Western Marxists, opposing imperialism from inside, we often distrust science when it's reduced to its function as a state apparatus. In contrast, our Eastern comrades see science as a tool for resisting and (sometimes) building socialism, supporting its development and funding.

We sometimes see scientific progress as tied to capitalism's harms, similar to a Lysenkoist view that sees science as "bourgeois" in itself. Reductionist agrochemistry and short-term extractivism have damaged science's reputation. However, modern biology offers a more holistic approach that can help bridge the "metabolic rift" between society and nature.

With new insights from epigenetics on how plants adapt to stress and to "educate themselves", agrobiology offers alternatives to intensive agrochemistry. We should consider the opportunities brought by this scientific revolution, against the standardization by GMOs for example.

Fighting for real scientific progress means rejecting profit-driven solutions and opposing the Malthusian ideas of the Western environmental movement.

– Ivan Michurin's new fruit varieties in the 1920s,

– Nikolai Vavilov's seed collection in the 1930s,

– Humberto Rios Labrada and the Cuban endemic seed protection efforts against agribusiness (2010)

– The "ecological red line" in China for the protection of biodiversity (2020)

Socialism has often protected biodiversity from global capitalist standardization.

Since 1921 in the USSR, *zapovedniks* (Figure 1) went beyond nature reserves, protecting entire regions where only scientists could enter to study biodiversity and local adaptations: they were sanctuaries of the highest degree. Their development only receded during Khrushchev's tenure, with the Virgin Lands campaign explicitly modeled on the American intensive monoculture system. The Soviets saw their ecosystems as a national treasure, but Khrushchev opposed them.

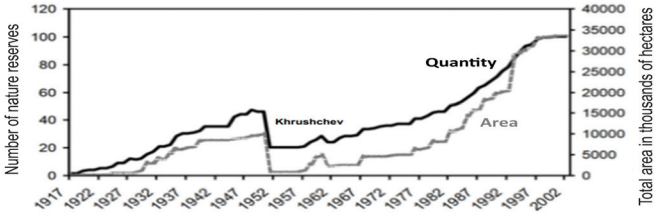


Figure 1: Evolution of the number and surface area of Zapovednik in the 20th century
Source: N.N. Kalutskova (2009), *Theory and Practice of Zapovednik Management, Study Guide*.

Pedology, which was a Russian specialty with vast and rich landscapes spanning twelve time zones, led to major agronomic innovations, especially through Vassily Williams, who highlighted agrobiology over Western agrochemistry. The "Plan for the Transformation of Nature" (1948-1952) was a unique agroforestry experiment following permaculture principles like polyculture, natural fertilizers, afforestation, soil protection, and crop rotation. This plan has been mocked and, later, forgotten in the West.

The Soviet dissident Jaurès Medvedev ironically stated in 1971 that this plan "*advocated not developing the fertilizer industry, leaving fields in clover for two or three consecutive years,* [...] *abandoning the use of certain machines (harrows, tractors) that destroy soil texture*".[1]

[1] Medvedev 1971.

The historian Gilles Harpoutian notes *A Brief History of Major Scientific Frauds*:[2]

> "Khrushchev and his government abandoned the crop rotation system [...]. American production methods were adopted".

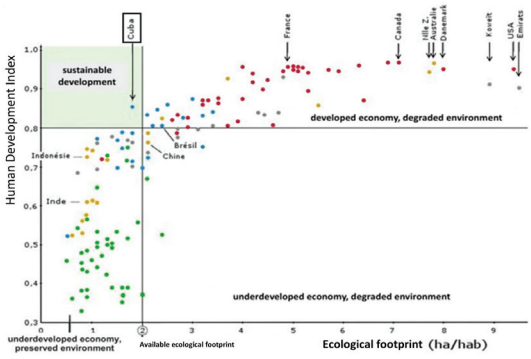
Critiquing the first agrobiological period, the Soviets themselves explicitly turned toward agrochemistry in the second period:

> «The production of the chemical industry increased by 250% between 1958 and 1965. The USSR accelerated the development of 'grand chemistry,' which would further intensify agricultural production» as noted in "USSR Questions and Answers" (1967, Moscow Editions).

For these reasons, I distinguish two periods in Soviet history, separated by Nikita Khrushchev, "Mr. Corn" (Kukuruznik), who promoted an agricultural race with the USA on its own terms.

The Cuban Revolution, emerging during the USSR's second phase, had to adapt in the 1990s "Special Period," shifting from its partner's model, and pioneering an agroecological transition, with organic peri-urban agriculture. The WWF recognizes Cuba as the only country to achieve sustainable development, balancing a low ecological footprint with a high Human Development Index (Figure 2).

Let's not forget that this transition, despite the U.S. blockade, was supported by China, which, during the same period, used its public funding and planning expertise to advance an ecosocialist model.



[2] Harpoutian 2016.

Figure 2: Ecological footprint and HDI at international level. *Living Planet Report* (2006), WWF, Zoological Society of London, Global Footprint Network.

China leads in solar, hydro, and wind energy. While Western emissions' apparent drop due to outsourcing, the slowdown in Chinese emissions results from voluntary measures since 2012, even as it remains "the world's factory." (Figure 3).

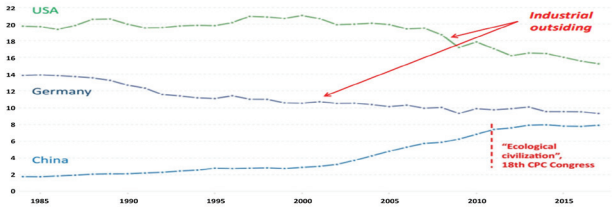


Figure 3: Industrial CO_2 emissions per capita, except forest ecosystems and agrosystems, in Tonnes of CO_2 equivalent. Source: https://donnees.banquemondiale.org

There is a tendential link between the construction of socialism and prioritizing environmental protection. When free from private interests and publicly funded, these fields often drive innovative solutions to the global crisis. However, this alone is not enough.

Lenin said: «*A revolutionary situation erupts when those at the top can no longer, and those at the bottom no longer want to*» (*"Left-Wing" Communism: an Infantile Disorder)*. He reminded us that a revolution requires a mix of objective and subjective factors. We could transpose this materialist approach to the ecosocialist transition, in which scientific and technological progress constitutes only one of the three conditions I want to identify here.

– Vietnam's glyphosate ban,

– Cuba's pesticide radical restrictions, and rent-free cooperatives,

– China's massive afforestation with the Green Great Wall,

All share one thing: state-owned land, meaning socialism.

It allows sustained public investment in agroecology, tailored farming techniques, and collective land ownership.

A socialist mode of production (partially at least), based on organized collectives, has enabled the rise of many civic groups in China that focus on eco education, for example.

Similarly, peasant unions like Cuba's ANAP, part of the international Via Campesina, help farmers share knowledge.

Socialism is necessary, but not enough on its own. What matters even more is the driving force behind the transition. History shows that the need for this transition comes from the struggle for national sovereignty, food and energy self-sufficiency, and resistance to agribusiness and blockades. In this context, agrochemistry and resource extraction lead to economic dependence, while agroecology and renewable energy diversification strengthen local and national wealth that must be protected. (Figure 4)

Ecological planning can arise from one, two, or all three of the conditions mentioned, meaning socialism is not the only path, though it's the most effective:

1: Non-socialist neocolonies can pursue ecological initiatives, but they often lack public funding and a class-based approach.

2: Imperialist countries may develop innovative projects, but these are quickly co-opted to justify harmful practices.

3: Even socialist countries have sometimes followed extractivist and polluting models to compete with imperialism.

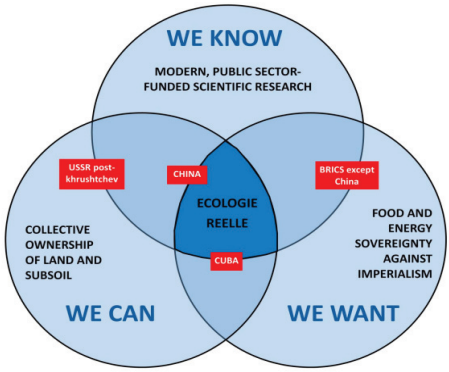


Figure 4: The three conditions of a genuine ecosocialism (Author's diagram).

From the perspective of what I call "real ecology", people must
– know [through scientific research],
– be able [with socialist planning], and most importantly:
– want [for food and energy self-sufficiency against imperialism].

In recent decades, useful examples show how emancipatory policies based on short-term objectives induce long-term policies more effectively than ethical commitments alone.

The opposition between "amoral capitalism" and "moral ecosocialism", as discussed by Michael Löwy, seems idealistic – shifting from Marxist exegesis to utopian ideas, like those of Walter Benjamin, who sought to merge Marxism with the phalansteries.

Marx himself said: By fighting capitalism to meet its own needs, the working class ends up liberating the entire people.

As a biologist, I see this as similar to exaptation, a concept from the great Marxist evolutionist Stephen Jay Gould. Just as feathers first evolved for thermoregulation before enabling flight, [or bones for calcium storage before supporting locomotion], a class struggle can, as a collateral effect, lead to long-term benefits for all of humanity.

To illustrate exaptation, Gould used the example of sandals made from recycled tires.[3] In short, function doesn't create the organ – it evolves alongside it, like functional recycling.

I like the idea that the working class, in fighting capitalism, is not just seeking liberation but also laying the groundwork for a global ecological transition.

Against reactionary eco-romanticism or the transposition of permanent revolution to ecosocialism, I believe that the serious study of pioneering countries – questioning the notion of "ecology in one country" – should be a key part of ecosocialist research. Studying Soviet, Cuban, and Chinese experiences is essential to this effort, helping to "de-westernize" the world (and the West itself).

[3] Gould 1993.

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Fig. 3: Industrial CO_2 emissions per capita: https://donnees.banquemondiale.org

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Class Stand in the Anthropocene

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Abstract

When my research partner Kevin Guanoluisa and I started working together, Kevin was a high school student from a working class immigrant family. His debate coach introduced us. We met regularly for six months to discuss academic literature, the influence of capitalism and politics on academia, and produce a marxist critique of AI. Through dialog we developed a class critique of academic publishing as a mode of production. As we worked together to research the influence of corporations on AI research, we were able to unite around this critique to better organize the information we were finding. Our critique depended on putting our life experience in dialog with one another and the information we found in publications. This is not something AI can do for workers. The end result of our partnership was an investigation of the soft power of the company Palantir inside academia. This company is notorious for western chauvinism and collaboration with the brutal and fascistic US immigration police (ICE).[1]

Bio: William Vickery, anti-displacement organizer, communist, Math PhD from University Illinois at Chicago. Currently Math postdoctoral fellow at Peking University.
Kevin Guanoluisa, CUNY student, anti-racist organizer, child of the international working class.

Keywords: Artificial Intelligence, Class, Class Stand, Class Science, Worker Student Alliance

[1] The Wall Street Journal 2023.

1. *Introduction*

The thesis of this article is that non-experts can use dialectical materialism to do research independently of the capitalist class inside academia. Take "people whose full time job depends on publishing in academic journals" for a working definition of academia. By capitalist class in academia, I mean those academics who control capital (grants and departmental funds). Intellectuals committed to the working class should build a base of organic working class intellectuals. This builds resilience inside (and outside) academia to the capitalist class ideology. Kevin and my partnership is a step in that direction.

As of writing, Palantir employs at least 22 research employees with publications in academic journals. Academics working for universities co-authored papers with the Palantir employees, which we believed led to the promotion of Palantir's software for use in Hospitals. The electronic health data in the National Clinical Cohort Collaborative (N3C) public health database is currently "integrated and harmonised in Palantir Foundry".[2] Palantir CTO Shyam Sankar, recently appointed Colonel by the Trump administration,[3] told Ross Douthat Foundry is supply chain management software "From the factory to the foxhole," meaning it is also used in military applications. 7 US hospitals, US Health and Human Services (HHS), the US Center for Disease Control (CDC) and the UK National Health Service (NHS) now use Foundry. Former Chief Medical Officer and current Palantir employee William Kassler co-authored an op-ed advocating for public-private partnerships with tech companies in the American Public Health Association's journal.[4] The same APHA purges communists and bans them from conferences.[5] There is also evidence of increasing Palantir influence in African public health programs.[6] Some authors call such a nexus of corporate money and "scholarly" research a subordinated innovation network.[7] Kevin and I have drawn the relationships we discovered as maps on the littlesis.org website.[8]

[2] Haendel et al. 2021.
[3] Task and Purpose 2025.
[4] Kassler & Bowman 2023.
[5] CHALLENGE 2025; CHALLENGE 2020.
[6] Hines et al. 2023.
[7] Rikap 2021.
[8] Vickery & Guanoluisa 2025.

We hope to deepen our research into the causal relationship between the academic promotion of Foundry and its adoption in hospitals and for public health in future research publications.

Our critique of academia maps academia as a web of social relationships. It is based on my working experience as an early career researcher. I feel the pressure to join a small community of like-minded mathematicians and closely follow the research direction of a senior colleague. Lukács described how disciplining the scope of inquiry produces ideology in academic work.[9] Hard science also has ideology.[10] More work on how ideology manifests in the field of math is needed. I saw the same economic process that Lukács described. The most salient factor was the pressure to conform. I needed to either produce a work of singular genius to justify my independent attitude or join a research community to get the help I needed to get published. I wanted to find colleagues interested in promoting greater class consciousness in our research. The idea would be to consult with mass organizations and co-produce research. I was inspired by the organizing efforts of the 1960s to unite workers and students in China in the Cultural Revolution[11] and in the US in the Students for a Democratic Society.[12]

I work in China, and I spent a lot of time learning Chinese in order to talk to the janitors and construction workers working next to me in the office.[13] I wanted to know what they thought of what I was doing and how I could make my research work relevant to the working class. I tried to explain that I am also a worker, and what I produce is articles. They incisively insisted on probing exactly how many hours it takes me to write one article. If I was a worker, they wanted to know the labor value of what I produce. The truth is that most of a full-time academic's time is spent maintaining and expanding the network of contacts they have in the world of academia. This network is where the labor value accumulates. The network is what valorizes the value of an article.

[9] Lukács 1923.

[10] Sheehan 2018.

[11] Horn 1971; Han 2008.

[12] Leonhardt 1970; Vickery 2025.

[13] Read working-class intellectual Fan Yusu's autobiographical essay I Am Fan Yusu to learn more about the lives and thoughts of the Chinese working class.

I tried to ask the workers in my lab what they thought about AI as well. One day I hope to involve manual laborers in research. It's going to take more people, more time, and more experiments to build the movement necessary to support this type of research partnership. The Chinese example required considerable political struggle even after the hard fought revolution.[14] Kevin's and my dialogue is an experiment,[15] and we hope others will try to imitate and improve our methods. Kevin and I plan to keep our work going forward, and we hope to win more intellectuals to this way of fighting for the working class.

2. *The Origins of The Research Partnership*

Our philosophy is founded in Benjamin's analysis of literature as the end result of a production process. Another foundation is the Maoist concept of class *jieji* and class stand *jieji lichang*. Researchers have to ally with the working class or the capitalist class. There is no neutral observational standpoint. This is the meaning of the class stand. Mao Ze Dong describes how class is central to research in Against Book Worship, "Our chief method of investigation must be to dissect the different social classes, the ultimate purpose being to understand their interrelations, to arrive at a correct appraisal of class forces and then to formulate the correct tactics for the struggle, defining which classes constitute the main force in the revolutionary struggle".[16] Chinese academicians still advocate this research epistemology in China today.[17]

Kevin and I have to describe our own working relationship to demonstrate the material practices that make our work a working class stand. Walter Benjamin said that the production process of literature is a part of the content.[18] We are applying this concept to scientific literature as well.

I tried to explain this project to a Philosophy PhD student in China. He pointed out how it is similar to Socrates' dialog with Meno's slave. In this dialog Socrates demonstrates the innate human capacity

[14] Han 2008.

[15] In Maoist terms, scientific research, production, and class struggle all fall under the label "practice" (shijian). Because this use is awkward in English, we use "experiment" for Kevin's and my research partnership.

[16] Mao 1930.

[17] Li & Li 2024.

[18] Benjamin 1934.

for reason by leading Meno's unnamed slave through a very one sided dialog to verify a geometric proof. This current experiment is not a question of whether workers or non-experts have the innate capacity to reason. This is a liberal notion. My interaction with Kevin was something like a Socratic dialog, but the goal was not for Kevin to demonstrate innate capacity research. The goal was for us to approach this project as equals. The production of an intellectual product is a part of the content. Only by approaching the project as equals could we create an intellectual product taking a working class stand. This is not an abstract ritual. I will describe how this partnership disciplined our research methods. Our egalitarian partnership disciplined us to cross these borders dividing disciplines. We both had to unlearn some of our education.

When I visited home from China, I would always try to find a picket line or a Gaza protest to visit. One of my comrades from past struggle was suspended from his high school teaching job because of his public commitment to condemn the genocide.[19] My teacher friend had also received a PhD; he studied Walter Benjamin. We often commiserated over the capitalist nature of academic production. We agreed it was wrong to accept the privileges afforded to academics (on condition of reproducing capitalist ideology faithfully), but it was also wrong to become anti-intellectual or reject science. When my friend was suspended, he had to report to an open floor plan office with white walls and glass partitions. Other suspended workers attended, but it was strictly forbidden to communicate. This could result in additional "departmental charges."

We would watch the French documentary *How Yukong Moved the Mountain* about the cultural revolution together.[20] Part 4: The Generator Factory, shows workers taking a break to watch a play where the plant engineer is lampooned for his domineering attitude and impractical plans. The workers are cast as the heroes because they have to fight the engineer to defend their own plan to fix the generator rather than start production over. We dreamed of being alive in that time and attending the long meetings about dialectical materialism so we could oppose the production bonus system. I was alienated, and he was disciplined and punished. Once my friend's suspension ended,

[19] CHALLENGE 2024.
[20] Ivens & Loridan-Ivens 1976.

he was able to start mentoring students again. He still felt that his responsibility to prepare students for a capitalist career was in tension with his responsibility to teach against capitalist ideology.

My research partner Kevin recalls our meeting as follows "My collaboration with William started in a virtual Zoom meeting I was invited to by my teacher. Our dialogue quickly centered on the pervasive influence of social media algorithms, specifically how Instagram's systems were amplifying biased political content. I remember friends decided to show their violent feeds to William and my teacher, who were surprised at the content. My teacher then mentioned an essay that I wrote on how math must be used as a social good to counteract its bad uses, connecting the violent Instagram algorithms to the math behind it. Then, William posed a question that would redirect my academic trajectory: he asked if I would be interested in coauthoring a paper with him on the subject of AI. I immediately accepted. The project presented the opportunity to do exactly what I set out to do for a living. I wanted to somehow use mathematics as an instrument for social good, and this seemed like the perfect opportunity to do so right now as a high school student. I was particularly driven by the challenge of the 'black box' problem, and pinpointing where racial biases occur within AI systems despite the best attempts at stopping them. The potential to develop methods to 'open the black box' to make these systems more transparent and equitable intrigued me."

3. *Initial Communication*

The experiment started a little bit rocky. I prepared a number of what I considered to be primary resources: mostly interviews with tech executives and conference presentations. One of the main sources was The Harms and Risks of AI in the Military Conference (2025). I was strongly influenced by the old science for the people pamphlet, sciences against the people: the story of JASON about automated warfare. This pamphlet moved me to protest the CIA recruiting event on my campus in graduate school. I was assembling an interesting collage of source material to sew together into a compelling narrative about different technical modalities of counter-insurgency. I had the impression that this AI warfare was strongly reminiscent of past forms of modeling the human mind as an input-output system like Project Bluebird, Project Artichoke, and MKUltra. I was influenced by the

"noided left" online movement of podcasts and twitter personalities. I wanted to engage with an article a Chinese high school student shared about how Israeli commanders had manipulated the ideas of Deleuze and Guattari.[21] This could have been an interesting experiment in personal expression, but it was limited to that. It was not co-creation; it was not a replicable methodology for winning non-experts to class conscious intellectualism.

Kevin was not particularly interested in grokking my selection of sources to form paranoid impressions. He found five academic articles which I felt were too conservative. Neither of us engaged with the other's sources at first. I started to try to explain about my vision and how we needed to go outside of the academic mainstream, and I began to vent about my frustration at work in the mainstream world of research. Kevin explained that The Real Knowledge Transfer was about this subject, namely neoliberalism in the academy.[22] I started to recognize some familiar physiological signs of an emotion that often arose in my political organizing work. I was having my own hypocrisy and biases exposed by someone who I was trying to persuade without understanding the material basis of my own position: the definition of idealism. I had to read this article to be responsible to my research partner, which was the first step in a long march of commitments to the international working class. Going forward we dedicated an entire meeting (sometimes two) to dialog about each of the articles Kevin had chosen.[23] We would build a relationship with one another this way, which would become the foundation for our future expression.

It seemed like the authors that Kevin initially suggested followed a classical petite bourgeois pattern of reaction. The crisis begins to affect this social stratum after the transition from capitalist free competition to monopoly. Lenin described the transition from competition to monopoly in Imperialism the Highest Stage of Capitalism.[24] "This is something quite different from the old free competition between manufacturers, scattered and out of touch with one another… Concentration has reached the point at which it is possible to make an approximate estimate of all sources of raw materials … An approximate

[21] Weizel 2006.

[22] Harney 2010.

[23] Obermeyer et al. 2019; Maurer et al. 2022; Coleman 2021; Harney 2010; Verdegem 2022.

[24] Lenin 1916.

estimate of the capacity of markets is also made, and the associations "divide" them up among themselves by agreement. Skilled labour is monopolised, [including] the best engineer". Academic researchers are in the position of newly monopolized engineers. Previously we had relative liberty to practice our craft and enjoy somewhat unconditional funding from monopoly capital. Now we want to go back to the earlier time. We are rebelling against evaluation. But is it only for our profession or is the rebellion for the whole working class?

Several of Kevin's articles oriented their political goal towards something they called the "commons" or the "undercommons".[25] Verdegem gives an excellent historical exposition of the rising power of monopoly in tech. He defines the "commons" to mean socializing the benefits of the capitalist tech monopoly, "In this article, I propose the framework of the commons for helping to imagine alternatives in the context of AI capitalism. The commons is an approach that allows us to rethink collective ownership and governance regimes and empower more groups in society to have control over and a say in the development of AI". [26] Schemes to socialize the rewards of monopoly capital while maintaining capitalist class relations are exactly what Lenin condemned in Imperialism the Highest Stage of Capitalism. For me it is the main theme of the book. The name "commons" implies a return to a pre-capitalist era. We need to move forwards to revolution. We must make revolution even when we are writing research papers. For this we need the class stand. Coleman, Obermeyer et al., and Maurer et al. also provided a lot of useful information, but they were not examples of research with a working class stand. I didn't have any example of a class stand in research either. Kevin and I had to create it together through our dialogue.

4. *Relate to One Another Based on Historical and Material Experience*

I wanted to listen to why Kevin felt strongly about reading these authors. I found out we both shared a similar personal history of fascination with using technology especially math for activism, "As our collaboration began, Copo expressed an interest in my intellectual

[25] Coleman 2021; Harney 2010.
[26] Verdegem 2022.

background. He inquired how I had been, as he phrased it, "recruited" to mathematics. I traced my passion to my high school math team, where I was first captivated by the inherent beauty of abstract concepts. This initial attraction led me toward "pure math," a discipline I admired precisely for its lack of practical application. I used to believe that truly beautiful mathematics could not exist with an application in mind, or else its logical purity turns into estimation. However, this perspective was changed by my involvement in debate, where I engaged with the darker applications of mathematical principles. I analyzed how machine learning models could perpetuate and obscure systemic racial biases. This was complemented by seminars at a mathematics summer camp, where I observed that many gifted alumni were funneled into lucrative but socially detached careers in quantitative finance, such as at firms like Jane Street. While comfortable, these paths not only seemed to lack a direct connection to alleviating societal disadvantage, but actively enabled the "profit at all costs" doctrine of these firms. This period marked a critical shift in my thinking; I began to seek ways to harness my affinity for mathematics not as an end in itself, but as a tool for positive social change." In particular we were both attracted to the idea of acquiring technical skills. However we saw the prescribed conservative social role for technical experts during the process of recruitment and training. We wanted to apply our technical skills to a counter-hegemonic project. We both identified with and admired Aaron Swartz, who tragically ended his own life after a federal prosecutor who resented his previous activism charged him with preposterous cyber-terrorism charges for downloading and sharing academic articles.

I shared with Kevin my admiration for Aaron Swartz, but I also shared my criticism. Aaron Swartz had a strong personal moral commitment, and he inspired other people who shared his technical expertise in web development. However this approach also had a drawback. He was organizing a much smaller group than the whole working class. We discussed how if Aaron Swartz had built a broader base in the working class and involved them in his activism, it is possible the federal prosecutors would have found it more difficult to single him out. We discussed how good people can have petite bourgeois ideology. We both believed in versions of petite bourgeois ideology in our life journey. By discussing concrete experiences from our own lives it was possible to communicate. We mediated our discussion of

the academic articles by primarily focusing on how the articles related to our personal experience. Kevin described his experience in his reflection as follows, "With this new framework established, William and I delved into the academic literature. I found our discussions of scholarly articles to be very stimulating, particularly due to William's rigorous critical approach. I recall one instance involving a paper that advocated for the deprivatization of AI and the creation of a 'digital commons.' My initial reaction was supportive, but William offered a more nuanced critique. He argued that the commons themselves can function as a capitalist instrument, noting that the underlying motivations of the corporates and the inherent capitalist logic embedded within the AI products via their biased datasets remain unchanged".

5. *Converging on a Class Stand*

We converged on a materialist analysis of academia in terms of networks, which we developed together even though I came to the partnership with something like a preconceived notion. I referred to my own personal experience working in academia to persuade Kevin to engage with this framework. I described how the pressures on me at work reflected real social structures of power and influence inside academia. I was repeatedly reminded by peers and more senior scholars to spend more time networking.[27] The marxist theory helped me relate my personal experience with these social structures to class politics. Our working hypothesis is that the labor value in academic production enters the production process by organizing networks. These networks are necessary to valorize articles. This kind of first-hand work experience is what persuades workers in general.

Reproducing this network is a very political process. Colleagues also reminded me how important it was to show deference to senior scholars and to be mindful of returning favors. The "value" of an academic relationship depends on many factors. An academic relationship might be like an old machine that is no longer productive. The relationships need to valorize capital in the form of grants or partnerships with industry. One way of evaluating a relationship is to insist on publishing metrics. I think that this is primarily a way of

[27] The attitudes of peers versus senior colleagues reflected the class nature of academia; class relations within academia deserve further attention.

putting pressure on academics. Articles are not inherently valuable. We are not workers who make articles. If the subordinate academic is doing what the funding controllers want the bosses waive these arbitrary restrictions.

As Kevin and I discussed this framework for viewing academic production with reference to an intentionally organized network, we started to analyze how he had come across the articles that he had initially suggested. In particular, he found the journal Catalyst because it appeared on a list of Current Major STS journals published on the University of British Columbia's homepage[28]. We discussed how academics organize conferences both to network new relationships, maintain and deepen old relationships, and to announce their networks to the world. I suggested that Kevin might want to curate his own list of STS journals based on looking at the list of keynote speakers at the Venice Marx in the Anthropocene Conference, the Italian STS Conference, and a list of overlooked scholars suggested by another scholar in Venice. Kevin found a lot of new authors and journals this way. I actually learned a lot from Kevin's list too. He suggested the work of Alessandro Delfanti on AI and taylorism[29] and the paper on AI ethics and subordinated innovation networks.[30] Kevin also helped me develop the theory by talking to me about it. If not for his critical ear I would not have abandoned some irrelevant petite bourgeois sidetracks of my own. The most important aspect of making the list was that it provided an experience investigating the practical application of our theory. Sharing this theory of academic value creation would help us to quickly develop the next phase of our research, where we investigated the influence of a particular capitalist company inside academia.

6. *The Investigation Turns Towards Palantir*

Kevin wanted to investigate the company Palantir, "During a brainstorming session, I shared a personal narrative about my family's experience. I described how my parents, residing in a predominantly immigrant Latino neighborhood, lived with a sense of alarm due to

[28] Current Major STS Journals n.d.
[29] Delfanti & Frey 2020.
[30] Steinhoff 2024.

the widespread reports of ICE raids. I connected their fear to my research, which had revealed the expanding use of biometric data by ICE to facilitate deportations and the pivotal role played by the data analytics company Palantir in building these systems. William, who had a pre-existing research interest in biometric data used by the IDF in food distribution centers, immediately recognized the connection. We decided to focus our paper on an investigation of Palantir. This decision cemented the profound personal significance of our work. The algorithmic systems we are scrutinizing are not merely academic subjects; they are active forces that directly impact my community and fuel the anxieties my family confronts". Kevin found a list of academic publications that Palantir employees co-authored by searching the Palantir website. We looked up each of the articles, and we found the grant that funded the research. We created a littlesis.org map to accompany this conference paper and visually diagram the network of co-authors and Principal Investigators.[31] This is the subject of ongoing work, we hope to follow up with quantitative as well as qualitative analysis of Palantir's network of influence in Public Health.

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Fourth Part

Planning and Visions

Urban Forms of Capital in the Anthropocene: Violence and Urbanisation

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Abstract

Urbanisation continues to consume land. In regions where land development is most intense, there are two main types of growth. The first is the slum, which is one of the most widespread forms of housing in the world. The second is the construction of gated communities comprising detached houses with gardens or high-rise towers with restricted access. These two forms of urban expansion represent a dichotomy between maximum deregulation and maximum control. Both are responses to the significant inequalities generated by the accumulation of capital. In the case of gated communities, control of the environment is a security strategy that generates violence at the limits of control and a clear sense of otherness. Slums are a response to maximum self-regulation, a necessity born of oppression. Violence is inherent in the production and function of the city.

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Keywords: gated communities, slums, urban battles, urban conflicts, urban complexity

1. *Urban planning, violence and the state*

Urban planning, as an act of order, is a tool that enforces specific guidelines on space. Consequently, organising space and territory involves modifying an established order to create a new one, thereby exercising power over space and, usually, over the activities associated with it. In urban planning, boundaries are 'ordered' and redefined, functions are modified and new futures are created, in which energy, matter and information are organised at the expense of drastically altering the present. This radical transformation of space can be compared, on a smaller scale, to the construction of a state, where new boundaries dictate new laws that govern people's lives, as well as materials and energy within and on the borders of the state. As Wolfgang Sofsky expresses in his *Traktat über die Gewalt*,[1] both the creation and destruction of a state are products of violence. Clearly, the power required to establish a state is not analogous to that needed to implement an urban plan, but urban planning is also the result of the conflict generated by any transformation.

Modifying existing material, energy and entropy flows is only possible by generating social and ecological tensions, which implies a greater or lesser degree of violence. In this case, violence is not merely accepted; it is an intrinsic part of land transformation. John Bellamy Foster's concept of the 'metabolic rift',[2] taken from *Das Kapital*,[3] might be related to land development. The dissociation between urbanisation and nature is generally presented as a rupture with the natural environment.

Following this discourse, we might consider urbanism and the city to be a perpetuation of violence. Therefore, we will attempt to specify some of its manifestations. In the context of the relationship between urbanism and violence, we will highlight the city as a space of conflict and a battlefield; the exercise of control over space and, consequently, over society; the main forms of urbanisation that are assimilated into capitalistic products; and, finally, the search for simplicity in the city as a manifestation of violence in the face of complexity (see Figure 1).

[1] Sofsky 1996.
[2] Foster 2000.
[3] Marx 1867.

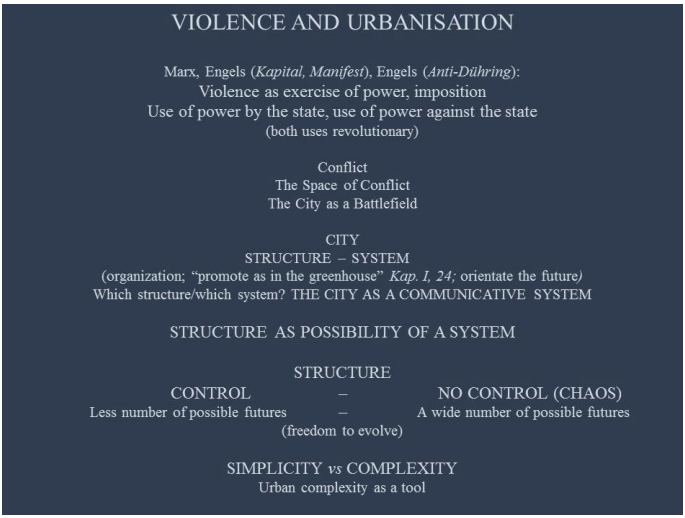

Figure 1: Scheme showing the relationship between violence and urbanisation. Source: The authors.

2. *The conflict in the city*

The violence inherent in class struggle manifests itself in space in multiple ways. The condition of land value – its differences in terms of associated function, relative position, and social condition – is a translation of market value into space, albeit with different determining factors. In this context, cities are generally spaces for capital accumulation, with land values tending to increase in city centres and decrease the further away from them we go. Setting a value for land creates conflict because it establishes ownership, generating tensions due to differences. Conflict in cities is rooted in the delineation of plots of land itself. Properties communicate with each other, and this is also a form of conflict in the development of the city: a kind of competition in terms of land value.[4] Space in the city manifests as a class struggle.

However, conflict over space in the city can escalate beyond the value of land. In fact, despite being a highly striated space, the city – usually a place of habitation – can sometimes become a veritable

[4] See Ruiz 2001, pp. 1-78.

battlefield. Traditional war manuals tend to advise against direct intervention in cities due to their spatial and social complexity.[5] In previous studies, we used graph theory to demonstrate how the complex topological structure of cities can enable weaker adversaries who are familiar with the area to defeat stronger ones by exploiting the city's layout.[6] We demonstrated this in Mogadishu during the battle that was made famous by Ridley Scott's film *Black Hawk Down*.[7] This involved Task Force Ranger carrying out a special mission to capture Habr Gidr, one of Mohammed Farrah Aidid's leaders, in Mogadishu.[8] What should have been a straightforward operation to storm a meeting of the leader in a hostile part of the city on the afternoon of 3 October 1993 escalated into an intense battle between the Somali National Army, commanded by Aidid and armed with rifles and RPGs (rocket-propelled grenades), and the American special forces, armed with Black Hawk helicopters and Humvees (High Mobility Multipurpose Wheeled Vehicles).[9] This allows us to observe how the Somali militias, who were familiar with the city, colonised the space, while the US Army, who were unfamiliar with the city, were limited to occupying the streets with heavy artillery and making predictable movements (see Figure 2). Light artillery could shoot down helicopters, causing absolute chaos in the city. The swarm defeated the elephant.

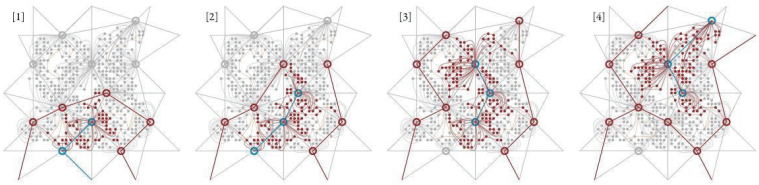

Figure 2: Set of topological graphs representing the Battle of Mogadishu on 3 October. The US Army is represented in blue and the Somali militias in red. Source: Aquilué, 2013.

[5] Von Clausewitz 1832.

[6] Aquilué Junyent 2013, pp. 7-26; see also Aquilué Junyent & Sánchez 2013, pp. 1-8.

[7] Scott 2001.

[8] Bowden 1999.

[9] Parker 2006.

This battle, which took place in the early 1990s, is often cited in literature about how small forces can defeat large armies,[10] and its tactics have been adopted by counterinsurgency forces. One example is the Israeli Defence Forces' incursions into cities and refugee camps in the West Bank during the Second Intifada (2000-2005).[11] Having studied the works of post-structuralist philosophers and architects such as Jacques Derrida, Félix Guattari and Bernard Tschumi,[12] the army had learned insurgent techniques. This led the IDF to rethink their approach to space, shifting their focus from existing forms to deconstruction in order to build a network that would destroy the existing one. This concept is explored in Eyal Weizmann's renowned essay 'Urban Warfare: Walking Through Walls', which details how the IDF sought to defeat Palestinian militias who were familiar with urban spaces by constructing their own network and creating holes in walls. Therefore, by tracing a network on top of an existing one, the army defeated the Palestinian militias using counterinsurgency tactics and an inverse reading of space. These tactics were employed in Nablus and the Balata refugee camp in April 2002, for example. The city became a battlefield on which the aim was not to build, but to destroy. During the Second Intifada, just days after the battle in Nablus, the same tactic was employed in the Jenin refugee camp. However, this time it was unsuccessful. The insurgency could not be defeated, resulting in the area's total destruction (see Figure 3).[13] The focus shifted from breaching walls to demolishing the entire urban structure. Destroying the space was equivalent to destroying the enemy of the IDF and represented one of the most extreme forms of violence against space.

[10] See Arreguín-Toft 2001, pp. 93-128; Paul 1994; Gray 2002; Hirsh 2003, pp. 60-63.

[11] Catignani 2005, pp. 57-75.

[12] Tschumi 1994; Deleuze & Guattari 1980.

[13] UN/ONU 2002.

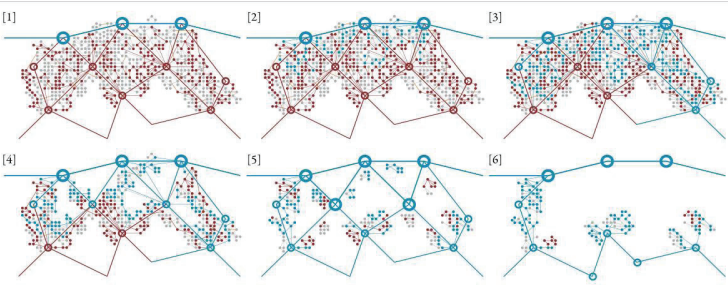

Figure 3: Set of topological graphs representing the Battle of Jenin in April 2002, which resulted in the complete destruction of the city's urban form. The IDF is represented in blue and the Palestinian militias in red. Source: Aquilué, 2013

3. *Control and self-segregation versus Non-control (Chaos) and inflicted segregation*

There are two processes of planetary urbanisation that spread across the territory and expand by occupying land and resources. The first is gated communities.[14] These represent the materialisation of urbanisation aimed at social classes that wish to segregate themselves from environments they deem hostile. They are a physical, energetic and topological manifestation of the violence generated by the accumulation of capital. Gated communities generally take the form of enclaves intended for social classes whose pretensions require the construction of controlled spaces. These spaces take specific forms, such as villas surrounded by gardens with controlled access and condominiums that can only be accessed via a large electrified gate; once inside, only the owners can move freely. These are self-contained bubbles of control and simultaneously the materialisation of class inequality. They are spaces of self-imposed segregation for those who cannot identify with others. Capital and land development are taking on this form of urban segregation through gated communities (see Figure 4). This urban form is based not only on controlling access, but also on controlling property and use, and even controlling community rules

[14] Blakely & Snyder 1999.

of order and cleanliness over any form of life within its boundaries. Once again, we see a boundary where power is exercised over bodies and lifestyles, linked to a specific space and form.



Figure 4: Aerial image of Pine Lakes, a gated community in Florida. Source: Google Maps, 2016.

Another form of urban occupation that is consuming hectares of land on our planet is slums. Large cities on almost every continent, particularly in temperate regions such as Africa, Latin America and parts of Asia, have seen a steady increase in self-built housing year after year (see Figure 5).[15] Although self-build patterns differ between cities, they generally fall into two categories: land occupations, where people build substandard housing, and illegal land sales, where there is no real ownership, usually involving illicit groups. These processes exist outside any regulatory framework and are a consequence of violence, primarily from the capitalist system itself. This system removes a significant proportion of the global population from regulated housing systems, whether market-driven or social. Secondly, the physical environment itself often takes the form of unsanitary conditions or physical threats, such as landslides and flooding. Many of these housing types are also associated with land distribution systems that are controlled by armed groups who use violence against the population. While violence is intrinsic to the emergence of slums, which can be viewed as heterotopias allowing for gated communities, their seemingly chaotic layout opens up numerous possible futures. In this sense, the lack of control and the chaos that characterise this urban form represent open doors to the future.

[15] Davis 2006.



Figure 5: Image of the self-built houses in La Comuna 13, Medellín, Colombia. Source: Inés Aquilué, 2024.

These two ways of inhabiting – gated communities and slums – are almost antagonistic forms of organisation, particularly with regard to control. In the face of urbanisation, control over space in gated communities is very strict in terms of both use and form. This results in minimal freedom to evolve, meaning the urban form remains almost unchanged despite changes in population needs. Conversely, the lack of control in slums, where space is produced through multiple, diverse and intersecting decisions, generates a certain informed chaos. This allows access to a greater number of possible futures.

In other words, although slums are a consequence of the inequality and exclusion caused by capitalism, the proposals for change can vary widely. As John Turner pointed out, these proposals grant residents a great deal of autonomy.[16] Coordination among those who inhabit these neighbourhoods could lead to their improvement, and perhaps over time they will become more open. By contrast, gated communities, which are the product of capitalist accumulation, offer their inhabitants little autonomy and few possible futures, since they must submit to community control to be accepted. Paradoxically, capitalist accumulation takes the form of a topological prison with a single access point and a set of spatial and behavioural rules.

[16] Turner 1976.

4. *Simplicity* versus *Complexity*

Cities tend to become complex, meaning the collective effect of individual actions creates a space where differences and overlaps are interwoven. Rather than being a place of optimisation, the city is a system in which contradictions and complementarities intertwine. The difficulty of comprehending the city as a whole makes it a challenging space to control. Returning to the first point of this article, power needs to understand in order to control; it needs to decipher the city in order to exercise control over it. Therefore, power advocates simplicity.

A prime example of the struggle against spatial complexity is Baron Haussmann's famous intervention in 19th-century Paris.[17] New roads were superimposed on the utterly irregular medieval layout, breaking up the city's fabric in an attempt to introduce modernity and a simpler interpretation of the city's structure that would facilitate control. The tortuous, strangely connected network of small streets can easily be seen as stitched together by a series of boulevards crossing the city. A simpler city is easier to control. Modifying the layout of a city inevitably involves violence. The fantastic book *Paris pour mémoire. Le livre noir des destructions haussmanniennes*[18] contains drawings of the façades of over 1,000 buildings that were demolished, creating an atlas of all the buildings that were torn down and all the façades that no longer exist. These were gradually replaced by luxurious boulevards. The replacement of the city centre with new materials and information is evident, and this simplification of the network could only be achieved by abruptly eradicating much of the previous urban form (see Figure 6). Forceful changes amplify fluctuations that require a great deal of intensity to materialise. The construction of modern Paris involved not only the modernisation of the city, but also a physical struggle against the working class.

[17] Réau 1954.
[18] Pinon 2012.

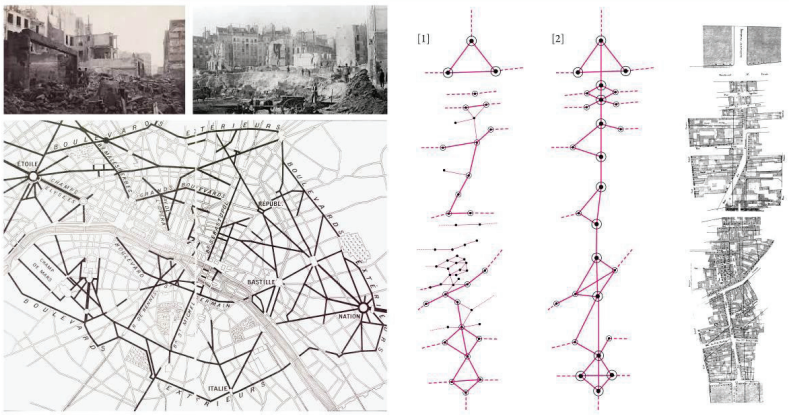

Figure 6: This graph illustrates how the street's topology changed before and after the construction of Boulevard de Strasbourg. Source: Aquilué, 2017.

Simplicity limits possible futures and standardises reality. This is also a characteristic of many modern utopias, which avoid any potential heterotopias and are designed so that each space is associated with a particular function or activity. It is a city with no room for the unknown, constructed from a few familiar elements. Simple order is also the result of violence, since the absolute elimination of entropy requires vast quantities of energy and matter to be devoted to negentropy. Without chaos, there can be no complexity. The basic premises of the functional city – leisure, work, transport and housing – are an attempt to rationalise urban life. This simplification has led to forms that attempt to translate the complex life of the city into function. This implies forgetting all the complementarities, overlaps and imperfections that make a city a city. It constructs realities that are, after all, fragments of optimums and consequently lifeless spaces.

Thus, simplicity is a common theme in utopias. As an idealised space, the utopia tends towards isolation and simplicity. The concept of utopia stems from profound reflection on the kind of society we should have, as well as on limiting patterns and prescribed behaviours, which are often transferred to space. A clear example of this is Le Corbusier's Ville Radieuse, a towering city intended to replace the centre of Paris (see Figure 7).

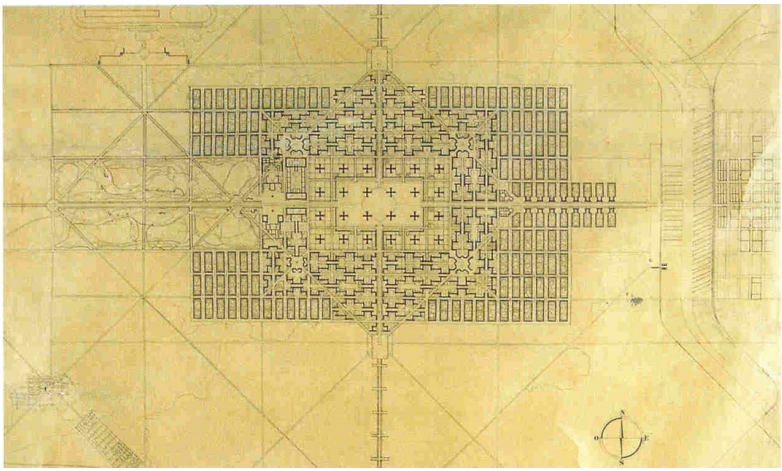

Figure 7: Plan for La Ville Radieuse, Le Corbusier, 1930. Source: https://www.fondationlecorbusier.fr/oeuvre-architecture/projets-ville-radieuse-sans-lieu-1930/

Utopias are generally constructed through behaviourism, as demonstrated in B.F. Skinner's renowned novel *Walden Two*.[19] In this novel, good behaviour enables an egalitarian and just society to exist. The only requirement is adherence to strict lifestyle rules, which is probably why isolation from the rest of society is necessary. Spatial utopias, such as the Ville Radieuse, also seek to influence behaviour through city design, achieving the same result as Skinner's approach but through the effective use of space. In spaces defined by their function, citizens are expected to behave in a certain way: people work in work spaces, sleep in housing spaces, move around in transport spaces and have fun in leisure spaces. Behaviour is determined by space. Utopia is radically deterministic.

In the 1980s, Ilya Prigogine and Isabelle Stengers demonstrated that the concept of the 'arrow of time' implies a link between life and irreversibility.[20] Consequently, it is impossible to predict the future; in other words, chaos is inevitable. Utopias confined to a specific time and space ignore this concept, meaning what seems ideal today could be dystopian tomorrow. The introduction of the 'arrow of time' shows how cha-

[19] Skinner 1948.

[20] See Prigogine & Stengers 1984; Prigogine 1996.

os and determinism can be connected through order and fluctuations. This suggests that, while it is impossible to know which possible future will come to pass, there are a limited number of possible futures. In this sense, the proposal recognises the importance of complexity in shaping the future through our actions. Complexity introduces time; it seeks not only difference, but also potential evolution and potential futures.

Ultimately, excessively determined futures become realities that require a certain degree of violence towards otherness in order to maintain themselves, including spatial violence as well as social violence. The optimum is univocal, so spatial chaos is undesirable. This is how utopia operates in space. However, life requires complexity in all its manifestations, including in space.

5. *Coda: Violence shapes urbanisation*

Since their inception, urbanisation and cities have been linked to violence, in terms of both the physical and the social, as well as the legal and the economic. Examples of how violence shapes cities include land consumption, the transformation of nature, metabolic rift, urban warfare, the destruction of cities and the simplification of urban structures. If violence is part of our habitat, then the city must surely be shaped by the tension generated by uncertainty. Rather than being an inconvenience, this is an inevitable reality that we must consider when designing and planning our cities.

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Art Utopias in the Warming Condition

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Abstract

In the warming condition, artists from diverse backgrounds display a renewed interest in utopia against the backdrop of the ecological crisis intensified by capitalism. Engaging authors such as Alfred Schmidt, John Bellamy Foster, Kohei Saito, Andreas Malm, and Silvia Federici, the article outlines a framework for a dialogue between artistic utopias and eco-Marxist thought. Such a dialogue is possible only if it avoids an uncritical return to the utopian socialists, attends to critiques of Prometheanism, but at the same time questions the assumption that utopia is inherently incompatible with material analysis and class struggle.

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Keywords: Utopia, Marxism, Nature, Art, Ecology

1. *Introduction*

In the art field, the past two decades have been marked by a distinct revival of utopia. This resurgence is closely tied to the now widespread awareness of the ongoing climate breakdown. As Andreas Malm argues, the warming condition disrupts the sense of synchronicity (an eternal present) that Fredric Jameson attributed to postmodernity and instead generates a broader social experience of diachronicity. Indeed,

it is impossible to think about climate change without considering the geological timescales of minerals and fossil fuels, and without sensing the urgency of a future beyond the capitalist model of development.

Building on the popularization of terms such as the Anthropocene and its variants, and propelled by the interest of decolonial theory in Indigenous and pre-/anti-modern temporalities, artists from diverse backgrounds turn – or return – to utopia. They do so by imagining alien worlds oriented toward care, commoning, and kinship; by rediscovering past intentional communities founded by subaltern subjects; or through participatory projects that experiment with organic relationships to the land, and so forth.

This article, without claiming to offer an exhaustive conclusion within its limited scope, aims to contextualize these utopias of the warming condition through the lenses of Marxism and political ecology, drawing on thinkers such as Ernst Bloch, Alfred Schmidt, John Bellamy Foster, Kohei Saito, Silvia Federici, and Andreas Malm.

It should be stated from the outset that my intention is not to revive the theorists of the utopian socialist tradition. On the contrary, Marx's original critique of socialist utopianism – its ahistorical character and detachment from class struggle – remains, in my view, valid. Nevertheless, the following pages seek to delineate a possible space for utopia within eco-Marxist discourse. Whether this space deserves to be expanded, inhabited, and put into practice, or instead left behind, is a question that further research, political engagement, and artistic production will have to answer. Which works and which artists, then, can we call upon as evidence of this utopian revival? In *Decolonizing Nature*, T.J. Demos examines artists who formulate ecological «models of utopia»[1] in the Anthropocene, where art converges with social mobilization to politicize intentional communities. DIY practices function as tools for constructing spaces resistant to neoliberal urban spaces, echoing Silvia Federici's call to re-enchant the world through forms of re-ruralization.[2] Within this context, Nils Norman's

[1] Demos 2016, p. 120.

[2] "Societies not prepared to scale down their use of industrial technology must face ecological catastrophes, competition for diminishing resources, and a growing sense of despair about the future of the earth and the meaning of our presence on it. In this context, struggles aiming to re-ruralize the world – e.g., through land reclamation, the liberation of rivers from dams, resistance to deforestation, and, central to all & the revalorization of reproductive work – are crucial to our survival". (Federici 2018, p. XVII).

Edible Park[3] operates as a long-term urban laboratory grounded in community planning. Sustainability is defined here as ecological and socioeconomic durability rather than green-capitalist branding. The project emerged partly in response to the 2006 OMA proposal for an energy-intensive creative hub – an emblem of neoliberal utopia – later abandoned after the 2008 financial crisis. In contrast, Norman's low-tech "anti-master plan" integrates organic agriculture and self-sustaining practices (rainwater harvesting, forest gardening, composting) developed with local permaculture activists on land allocated within the Zuiderpark. Norman's utopia advances a participatory ecological urbanism opposed to extractivist urbanization: art becomes a means of redesigning urban land through permaculture, volunteering, and DIY methods. This stands against OMA's globalized spatial imaginary and aligns with the horizon of degrowth, which rejects endless growth in favor of localism, deindustrialization, molecular democracy, locally grown food, and eco-feminism. Demos identifies two key references: Bruno Taut, a socialist modernist attentive to ecological dimensions of social housing, and the Diggers of 1960s San Francisco (inspired by the seventeenth-century English Diggers), who promoted community life integrating food production and artistic practice. These sources prevent reading Edible Park as a naïve return to nature and situate it instead within a modern, metropolitan scale of design. Yet such proximity-based ecological utopias risk losing radicality and becoming elements of the neoliberal green city, distant from the «revolutionary project inseparable from the commons»[4] that Peter Linebaugh refers to in his introduction to *Re-Enchanting the World* by Silvia Federici. Indeed, as Toni Negri and Michael Hardt argue in *Commonwealth*, since capitalism, and real estate rent in particular, extract value from positive externalities (such as, for example, the quality of life in a "green area" self-managed by groups of ecologically aware citizens), an antagonistic perspective is necessary to prevent their co-optation and valorization in the neoliberal-city scheme.

Between 2012 and 2018, Los Angeles-based artist and filmmaker Cauleen Smith explored utopia from Black and feminist perspectives. In 2010 she researched the Alton Abraham Collection of Sun Ra in Chicago, which informed *Black Utopia LP* (2012), a perfor-

[3] The Hague 2010.

[4] Linebaugh & 'Foreword' to Federici 2018, p. XVII.

mance in which slides with Afrofuturist themes are paired with a vinyl soundtrack mixing Ra's music and words, alongside texts by Krista Franklin and Avery R. Young. Sun Ra's *Space is the Place* (1974), centered on transporting African Americans to a new planet through the Arkestra's music, serves as an essential precedent. In 2017 Smith released *Pilgrim*, a journey through American utopian sites shaped by alternative communal experiments: Alice Coltrane's Sai Anantam Ashram, the Shaker community of Watervliet, and the Watts Towers. In 2018 she made *Sojourner*, inspired by Bill Ray's 1966 photograph of nine young Black men at the Watts Towers. Smith reimagines the scene with twelve women walking at dawn in Joshua Tree's Outdoor Museum by Noah Purifoy, carrying transistor radios transmitting readings from Alice Coltrane, Rebecca Cox Jackson, and the Combahee River Collective. *Pilgrim* and *Sojourner* evoke a "classic" utopia of spiritual withdrawal, shaped by Shaker asceticism and Coltrane's mysticism, and by rural landscapes and gardens; yet Smith's work also highlights the absence of Black women and other subaltern subjects from histories of realized utopias. The Watts Towers and Chicago's South Side Community Center function as urban acts of radical generosity. Smith's speculative reenactment in *Sojourner* introduces ambiguities between futurity and commodification, yet her broader practice constitutes an archive of subaltern utopias, where imagining ideal forms of life becomes a collective gesture challenging racist, sexist, and bourgeois norms.

Life on Planet Orsimanirana (at the Museum für Kunst und Gewerb, Hamburg, 2021), an exhibition curated by the Jerszy Seymour Design Workshop with MACAO and Assemble, draws on cosmic Afrofuturist utopias to imagine a different planet shaped by care, commoning and kinship. Though impacted by the pandemic, the project gained relevance as the crisis underscored the urgency of alternative modes of coexistence between humans and non-human beings. The catalogue defines the project as a «non-total, total artwork». The exhibition proposes a landscape of communal living and a cooperative radio station where design, music, painting, sculpture, technology and activism interact. The imagined planet rejects totality and fixed identities, privileging difference and open-ended forms of relation. Rather than offering a conventional display, the exhibition presents an environment where speculation and political engagement intertwine. The curatorial vision sometimes appears dominant, yet a closer

look reveals a richly heterogeneous ecosystem. Seymour describes Orsimanirana as an «autonomous version of William Morris's *News from Nowhere*, on acid»[5] indicating the project's mixture of utopian fiction, humor and social critique. The show addresses questions such as what kind of world we want to inhabit, how it should function, and what relationships – human and more-than-human – we can cultivate. Its deliberately naïve aspiration to equality and harmony aims to create symbolic, practical and imaginative groundwork for a different planet. Alongside this speculative horizon, the exhibition foregrounds social struggles. Documentation of MACAO's occupation of a skyscraper in Milan, materials from Hamburg's self-managed space Gängeviertel, and the presence of the workers-led Rimaflow factory ground the project in histories of resistance and alternative institution building.

Orsimanirana thus conjoins speculative kinship grammars with the Marxist and workerist lineage attentive to material relations of power, commons-based organization and the need to transform extractive, patriarchal and colonial social structures. This intersection is also expressed through the show's interventionist dimension. Part of the public program took place in contested urban spaces, including the courtyard of the Bille power plant, where the HALLO association and the WERK cooperative have long promoted common use of urban infrastructure against real estate speculation. The curators publicly supported the struggle for the common use of Bille (which at the time was at risk of being privatized) by transforming one of the institution's façade banners into a handmade statement in support of the cooperative, leveraging the museum's visibility for political purposes. Other actions operated through opacity rather than display. During the pandemic, museum guards – hired as students and paid decently – were reconceived as caregivers of the space. When asylum seekers camped outside the museum demanding access to Covid vaccines, one of these caregivers proposed supporting the protest; she was relieved of her duties and continued to be paid to organize a demonstration, which subsequently took place. These gestures clarify Orsimanirana's utopian project: a synthesis of speculative imagination and situated intervention, where the envisioning of better futures is inseparable from practices of solidarity and collective struggle in the present. Thus, is it possible to imagine that such utopias might par-

[5] Seymour 2021, p. 66.

ticipate in the processes of critique and abolition of fossil capitalism? Or, as Manfredo Tafuri argued with regard to the neo-avant-gardes, do artistic and architectural utopias end up concealing the reality of social relations behind imagination, revealing themselves as an ideological function internal to capitalist development?

Obviously, the main proponent of utopia within the Marxist field is Ernst Bloch, to whom we owe the definition of the opposition between abstract utopia (without grounding in reality) and concrete utopia (as the anticipation of tendency). Concrete utopia is:

> The point of contact between dreams and life, without which dreams only yield abstract utopia, life only triviality, is given in the utopian capacity which is set on its feet and connected to the Real-Possible.[…]. Thus the only seemingly paradoxical concept of a concrete utopia would be appropriate here, that is, of an anticipatory kind which by no means coincides with abstract utopian dreaminess, nor is directed by the immaturity of merely abstract utopian socialism.[6]

Also, for Bloch, art plays an important role in the implementation of the principle of hope, provided that, in keeping with concrete utopia, it is an art of tendency, that is, a system of (formal) anticipations in some connection with the development of the capitalist model as it can be scientifically foreseen in light of the analysis of present material conditions:

> Art is a laboratory and also a feast of implemented possibilities, together with the thoroughly experienced alternatives therein, whereby the implementation and the result occur in the manner of founded appearance, namely of worldly perfected pre-appearance. In great art, exaggeration and fantasizing are most visibly applied to tendential consistency and concrete utopia. Though whether the call for perfection – we can call it the godless prayer of poetry – becomes practical even only to a small extent and does not merely remain in aesthetic preappearance is something which is not decided in poetry, but in society. Only controlled history, with an incisive counter-move against inhibitions, with active promotion of tendency, can help essential material in the distance of art to become increasingly also appearance in the dealings of life.[7]

[6] Bloch 1996, pp. 145-146.
[7] Bloch 1996, p. 216.

Also Alfred Smith, a student of Max Horkheimer and Theodor Adorno who dedicated his doctoral dissertation to the concept of nature in Marx, emphasizes the distance separating Marxism from any form of abstract and ahistorical utopia. First, the future human reality under socialism, one of the subjects of Marx's speculation, is based on his refusal of the naïve idea of nature expressed within certain socialist circles. In *The German Ideology*, as Schmidt recalls, Marx polemizes with the so-called "true socialists", basically the current of utopian socialism that developed in Germany between 1843 and 1847. The group promoted the idea that man, to be happy, should become one with nature. Nature, often reduced to a picturesque representation of the countryside, it was nonetheless understood as a realm of absolute harmony and happiness.

Beyond the general Marxian critique of utopian socialism, accused of not being able to identify the engine for future transformation in class struggle, Marx was convinced that the naïve idea of the return to nature was dangerous insofar as it risked restoring pre-capitalist exploitative relations. Moreover, Schmidt notices how Marx and Engels, looking at nature from a materialistic and dialectic point of view, that is, from the point of view of class contradictions and relations of power, somehow anticipated Darwin's evolutionary theory: «Their materialist understanding of social conflicts gave them a sharp eye for the interminable struggles which take place within organic nature».[8]

So, once clarified the non-abstract nature of utopia in Marx, and cleared the field of any misunderstanding around the idealization of nature, Schmidt proceeds by identifying two different moments of Marx's utopian consciousness. Young Marx, especially in the *Economic and Philosophical Manuscripts* (written in 1844), still foresees, in the realization of socialism, the end of any opposition between humans and nature realized in the abolition of labor. Let's not forget that it is precisely through labor that man appropriates and transforms nature (even if he/she is, in turn, modified by it). In his later writings, especially in the *Communist Manifesto* and *The German Ideology*, Marx begins to negate the very possibility of an end of the dialectics between nature and man. The latter will always be forced to work, i.e., to continue to operate with nature, modifying it. Marx uses the

[8] Schmidt 2014, p. 130.

term "metabolism" to describe the endless exchange between man and nature. Under capitalistic conditions, the paradox is that the more human domination grows, the more human nature will be spoiled.

> It belongs essentially to the advance of civilization as more and more organized increasing domination, that nature takes revenge on the men who have degraded it to mere material for human aims, by ensuring that men can only buy their domination by an ever-increasing suppression of their own nature.[9]

What will change in the "true society", with the socialist distributions of means of production, is how that relationship is structured. The primacy of profit will be replaced by the goal of the cancellation of misery. Free time will grow to the extent of mostly (but not wholly) putting an end to the superstructural character of culture and Spirit, which will consequently grow and develop: «In a more rational society, the realm of necessity will be mastered, and its role will decline in relation to that of the cultural sphere».[10] What nonetheless remains clear, at least following Schmidt's analysis of the mature Marx, is the fact that, for the latter, this metabolic relation had to be modified to free human nature from necessity imposed over it by nature under capitalistic (and even pre-capitalistic) conditions. Socialist utopia coincides with the collectivization and the rationalization of human *mastery* over nature.

The nature of this mastery, however, should not be taken for granted. The issue is addressed by John Bellamy Foster in *Marx's Ecology*. He shows how the control exercised by humans over nonhuman nature develops, in the thought of Marx and Engels, not as blind command but as an understanding and a decision to follow natural laws. As further evidence of this thesis, he cites a passage from Engels:

> Thus at every step we are reminded that we by no means rule over nature like a conqueror over a foreign people, like someone standing outside nature – but that we, with flesh, blood and brain, belong to nature, and exist in its midst, and that all our mastery of it consists in the fact that we have the advantage of all other creatures of being able to learn its laws and apply them correctly.[11]

[9] Schmidt 2014, p. 138.
[10] Schmidt 2014, p. 140.
[11] Engels as cited in Foster 2000, p. 236.

Even Foster, like Schmidt, underscores Marx and Engels's insistence on avoiding the same mistake made by the utopian socialists, who proposed «blueprints for a future society that went too far beyond the existing movement».[12] Nonetheless, he makes it clear that the two philosophers did not refrain from constructing the hypothesis of a future liberated society also on the basis of the end of the alienation of nature. As further evidence of the ecological character of Marxism, Foster turns to a utopian novel: William Morris's *News From Nowhere*,[13] in which the protagonist falls asleep and wakes up in a future society where class divisions have disappeared, where the means of production are collectivized, where no repressive institutions exist, and where human beings do not maintain an extractive relationship with nature. Elsewhere, Morris imagines the factory of the future as a plant immersed in greenery, organized so as not to pollute either air or water.

This is how Foster highlights the affinities between Morris's view and that of Marx:

> Even while Engels was still alive, the close connection between Marx's vision of communism and ecological sustainability was already evident in the Utopian Marxist conceptions of William Morris. Morris first read Marx's Capital in 1883, the year of Marx's death, and openly declared himself a socialist at the same time. In addition to his argument on the dispersal of population in order to transcend the antagonism between town and country and his defense of wilderness (see Chapter Six), he is to be remembered (within environmental analysis) for his emphasis on production only for art or use – not for profit.[14]

Kohey Saito, in *Marx in the Anthropocene*, offers a severe critique of what he sees as a contemporary revival of utopian socialism, represented by those thinkers he calls «automation utopians».[15] The term refers both to "left accelerationists" and to those who, today, interpret a Promethean Marxism in which the continuous development of the productive forces, the automation of labor, artificial intelligence, and technology in general are seen as pathways toward a post-capitalist

[12] Foster 2000, p. 140.
[13] Morris 1993.
[14] Foster 2000, p. 236.
[15] Saito 2022, p. 145.

society. In short, Saito accuses this composite Marxist constellation of relying uncritically on the concept of general intellect coined by Marx in the *Grundrisse*, while ignoring his later writings, beginning with *Capital*. From that moment onwards, Marx not only does not return to the concept of the general intellect but becomes increasingly critical of the idea that the development of the productive forces (even if collectively controlled) could open the road to socialism while disregarding the need to restore a proper metabolism between humans and nature. Whether or not all the thinkers Saito labels as "automation utopians" would recognize themselves in the definition, Saito grants at least to contemporary Marxist utopia one positive function, namely its role in challenging, through the summoning of communist abundance, the capitalist paradigm of scarcity.

> Despite disagreeing with them, this chapter devoted many pages to the automation utopians because they, at least, have shown that 'abundance' and 'luxury' are dangerous for capitalism. They correctly grasp that the price mechanism of the market is based on scarcity, and abundance seriously disturbs this mechanism, opening up the possibility of a post-scarcity economy. Abundance is also important to envision an attractive post-capitalist future as an anti-thesis to neoliberal austerity.[16]

Obviously, the abundance to which Saito refers has nothing to do with that of the «fully automated luxury communism».[17] It is instead an abundance within degrowth, beyond any consumerist or productivist conception. For Saito, the post-capitalist society will not emerge from the collectivization of the development of the productive forces with its (unsustainable) abundance of commodities, but from the end of the artificial scarcity created by capitalism, when resources are shared in a way that allows the productive forces to decline, with the dual result of achieving a better life and of «lessen the burden on the natural environment».[18]

In conclusion, why not imagine that among the possibilities of art there is the capacity to function as a laboratory for anticipating one or more post-capitalist and radically ecological societies? The warn-

[16] Saito 2022, p. 162.
[17] Bastani 2019.
[18] Bastani 2019, p. 235.

ing to distrust any abstract utopia remains, that is, a purely imaginative exercise detached from struggles and from the analysis of present material conditions, just as it is necessary to be cautious of an anti-modern imagination that uncritically idealizes pre-capitalist conditions and retreats into an identitarian terrain. When these premises are respected, artistic utopia is not reducible to a Promethean register and acknowledges the ecological urgency of our time.

It is clear that the utopias of contemporary artists are not exclusively inspired by Marxism. Other fields of inquiry should be brought into the discussion, from the Black archive to the renewed attention to Indigenous cultures, which today are indispensable for any analysis of artistic utopia that often situates itself at the intersection of concepts and urgencies: ecological crisis, critique of anthropocentrism, of capitalist temporality, and of colonial modernity.

The aim of this article is, more modestly, to begin constructing a framework for investigating the place of ecological utopia in the artistic field in relation to eco-Marxism and political ecology. In this sense, I want to conclude with the words of Andreas Malm who, even if critically, agrees that utopia remains a site of interest in the midst of the warming condition.

Malm suggests that a specific historical sequence could be identified when referring to Western art and media production: utopia in the modern, pastiche in the postmodern, and dystopia in the warming condition. The author himself immediately problematizes this dialectical scheme, not simply by noting its regionality, i.e., the possibility that it cannot be applied so linearly outside the West, but also by suggesting, with Naomi Klein, the relevance of utopia to propel the necessary transformation towards a post-capitalistic world: «[…] If the climate movements and its various allies are to make any real dent in the curves, they probably – one of the key contentions of Klein – have to reinvigorate, recycle, reroute utopian impulses».[19]

[19] Malm 2018, p. 220.

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Housing History in Milan. A Political Economy of Urban Transformation

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Abstract

This paper develops a theoretical and methodological framework to interpret how class conflict has reshaped urban space across different stages of capitalism. By focusing on four competitive and contradictory functions of dwelling – reproductive, emancipatory, productive, and speculative – it outlines an approach to analysing how shifting alliances among workers, employers and rentiers structure housing regimes. The case of Milan is used as a first application of this framework, illustrating how these dynamics can be traced across liberal, corporatist, Fordist-Keynesian, and neoliberal phases.

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Keywords: Urban political economy, Housing regimes, Class relations, Urban history, Political Marxism.

1. *Introduction*

The *house question* lies at the intersection of political economy, urban history, and social theory. From Engels's *Zur Wohnungsfrage* onward, debates on dwelling have resurfaced at each major crisis of capitalism's spatial reproduction. Recent research on rent-gap dynamics and housing finance shows how surplus capital is channelled

globally through the urban space,[1] aggravating ecological strain,[2] and redefining capitalism's frontiers.[3] Yet despite this long tradition, the field remains fragmented between macro-theoretical inquiry and localised empirical work, rarely capturing the dialectical logic that reorganises housing provision across time and space. To bridge these divides, our analysis brings together four traditions.

First, the Marxist political economy of urbanisation, from Harvey's "secondary circuit of capital", to Ball and Haila, conceives housing as a commodity mediating productive and unproductive capital.[4] It reveals the contradiction between use and exchange value and rent's role in displacing crises into the built environment, though often overlooking institutional and social mediation.

Second, studies of gentrification and spatial restructuring reterritorialised rent theory by connecting accumulation to the transformation of urban fabric and its cultural meanings;[5] however, by focusing on neighbourhood processes, they tend to lose sight of broader historical dynamics and the regulatory frameworks.

Third, comparative housing-regime studies, emerging in the 1990s and refined under neoliberalism, shifted attention from capital flows to welfare institutions and tenure systems.[6] They clarified the State's role in structuring access but often froze regimes into typologies detached from capitalist transformations.

Finally, the financialisation literature after 2008 examined how debt, assetisation, and global investment reshaped links between households, finance, and the built environment.[7] Building on Marxian rent theory, it illuminated circulation and credit but downplayed housing's productive and reproductive dimensions.

Javier Moreno Zacarés's concept of *residential accumulation* offers a useful synthesis.[8] It explores the tension between rent extraction

[1] See Brenner, Schmid 2015, pp. 151-182; Madden, Marcuse 2016; Aalbers 2016.

[2] See Heynen, Kaika, Swyngedo 2006.

[3] See Christophers 2020.

[4] Harvey 1982, *The Limits to Capital*; Ball 1986, pp. 147-166; Haila 1990, pp. 275-296.

[5] See Smith 1996; Lees, Slater, Wyly 2008.

[6] See Kemeny 1995; Schwartz, Seabrooke 2008, pp. 237-261.

[7] See Fernandez, Aalbers 2016, pp. 71-88; Fields 2017, pp. 588-603.

[8] Zacarés 2024.

and capitalist production across four circuits – production, circulation, finance, and reproduction – while, in a Political Marxist vein,[9] grounding it in historically specific *social property relations*. Yet by centring on fixed mechanisms of accumulation, it risks flattening the varied functions of housing and the class relations that sustain them.

2. *Theoretical Framework*

Drawing on Zacarés's approach, this article develops a framework that identifies workers, employers, and rentiers as the main social groups whose conflicting interests shape the historical evolution of housing, and applies it to a case study. By workers we mean those who sell their labour power; by employers, those who organise and combine labour and capital in entrepreneurial activities; and by rentiers, those who derive income from the control of scarce assets, particularly urban land and space.

Table 1 outlines how these groups orient themselves toward housing policy according to the competing functions dwelling performs within capitalism. Each symbol indicates whether a class position tends to support expansive/inclusive (+) or restrictive/exclusive (–) policies. The reproductive function concerns labour's reproduction; the emancipatory, housing's ambivalent role as a means of independence and subjection; the productive, its place in the construction economy; and the speculative, its use as a vehicle of accumulation. The framework thus offers a grid to interpret how alliances and conflicts among labour, employers, and rentiers shape housing regimes and spatial formations across capitalist phases, as their relative power and the weight of each function are reconfigured.

[9] See for a recent synthesis on the political marxist approaches and debates to the history of capitalism, Brunazzi 2024, pp. 129-154.

Table 1: Class orientations toward housing policy according to the main functions of dwelling

Social Group	Reproductive Function	Emancipatory Function	Productive Function	Speculative Function
Workers	(+) Expansive: Housing as a condition for stability and family formation.	(+) Affordable housing enhances independence, mobility and bargaining power.	(+) Generally expansive: employment and wages benefit from construction	(±) Ambivalent: support restriction when small ownership enables petty accumulation; favour expansion when speculation inflates prices and rents.
Entrepreneurs	(+) A broad, affordable stock secures labour and local demand.	(–) High housing costs discipline labour and entrench dependence, reinforcing wage restraint.	(±) Sector-dependent: expansion is favoured when construction drives profits, but restraint when it drains labour or resources from other sectors.	(±) Opportunistic: favour a secondary channel of accumulation when it aligns with business cycles; oppose it when it diverts capital from production.
Rentiers	(–) Scarcity and high demand inflate rents and asset values.	(–) Restrictive markets enhance control, selectivity, and territorial hierarchy.	(±) Benefit indirectly from expansion through land development or infrastructure-led appreciation; prefer restraint once oversupply threatens asset values.	(–) Structural preference for restriction: rent extraction and capital gains rely on scarcity and appreciation.

The table refers to class positions rather than individual preferences, outlining structural orientations rooted in material conditions. The productive and reproductive functions often align labour and employers around expansive housing policies, while the emancipatory function tends to orient rentiers and employers toward restriction, constraining labour's independence, and the speculative function ties rentiers and small property holders to the scarcity on which rent-driven regimes depend.

In this framework, ideology acts as a lubricant of hegemony, organising consent around shifting images of the urban – alternately inclusive or exclusive – that stabilise dominant blocs while distorting subaltern interests. Seen through this lens, the housing question appears as a historical field of struggle where social groups contend over dwelling's functions and the institutions mediating or disrupting their balance.

Milan offers a strategic vantage point to observe these dynamics. Over the past two decades it has epitomised the turn of European metropolises toward real-estate-finance governance and the commodification of urban prestige, while welfare retrenchment has made housing access a key mechanism of exclusion. Yet its longer trajectory – from industrial expansion and corporatist regulation to welfare urbanism and neoliberal redevelopment – makes it a paradigmatic case to examine how shifting articulations of labour, employers, and rentiers reconfigure urban form and social reproduction.

3. *The Case*

3.1. *Liberal Milan: Reproduction as the Hinge of a Rising City (1881-1921)*

The late nineteenth century marked the moment when Milan became both an industrial and housing city. Between 1881 and 1913 its population nearly doubled – from 321,000 to over 640,000 – driven by migration from the Lombard and Veneto countryside. This influx of first-generation workers, drawn by expanding mechanical, railway, and chemical industries, sustained industrial take-off while producing a chronic housing shortage that authorities framed as a moral and hygienic issue rather than a structural condition of capitalist growth.[10]

Urban land and most of the rental stock remained in the hands of the Milanese aristocracy, whose rentier logic prioritised positional control over productive reinvestment. Families such as the Borromeo, Litta, and Trivulzio retained central ownership, delaying suburban subdivision. This regime constrained both housing supply and industry's capacity to stabilise its labour force.[11] For industrial employers,

[10] Comune di Milano 1969; Rumi 1993.
[11] Venuti 1986.

the key issue was not discipline but availability. The reproductive function – providing affordable dwellings to sustain growth – lay at its core. Most workers, migrants crowding Porta Romana and Porta Vittoria, lived in poor conditions where housing costs were marginal in labour reproduction. In a city lacking imperial inflows or a strong financial sector, the productive outweighed the speculative function. Construction offered opportunities to related industries and modest accumulation to local builders such as Broggi, Cuzzi, and Colombo who, facing weak middle-class demand, used cheap materials from Brianza and Valtellina and expanded output on thin margins rather than restrict supply.[12] For labour, speculation was out of reach; building work became a key entry into the urban economy, linking industrial growth and workforce reproduction.

By the turn of the century, demographic pressure had saturated dormitory districts. Overcrowding appeared as both social tension and hygienic concern. Yet scarcity stemmed less from rentier design than from rapid industrialisation, which strengthened productive capital over the old aristocracy. Within this shift, as class organisations emerged, the Municipality mediated. Through the Beruto Plan (1884-1889) and early municipal housing – such as the Case Popolari of Porta Ticinese and Viale Lombardia – the city sought to rationalise growth, channel private investment, and contain unrest without altering property relations.[13] A reformist compromise took shape.[14] As industrialists consolidated power and faced rising socialist representation, sectors of the bourgeoisie adopted paternalistic strategies. Cooperative and municipal initiatives, along with the Società Umanitaria signalled a new alliance between productive capital and organised labour around housing's reproductive function. Housing was redefined to integrate and domesticate the workforce. Within this coalition, rentier power waned, giving rise to industrial paternalism in which housing became both a productive and reproductive instrument of social peace.

[12] De Caro 2000.
[13] Pugliese, R. 2005.
[14] Rossetti 1981, pp. 275-378.

3.2. *Housing as Discipline in Fascist Milan (1922-1945)*

In Fascist Milan, housing became a laboratory for reorganising class relations. Rather than resolving the housing shortage, the regime used it to mediate between industrial and rentier capital while binding labour and the petty bourgeoisie into dependence – stabilising accumulation and consent.

For industrial employers, dwelling primarily served a productive function. Construction was reframed as a pillar of the national economy – an "industry of industries" sustaining profits after the deflationary *Quota 90* and throughout autarky. Public investment in large projects and residential building supported the construction sector and its industrial suppliers – steel, cement, mechanical, rubber, and electrical firms central to Milan.[15] The result was a State-managed outlet for overaccumulated capital rather than welfare.

For rentiers, speculation was modernised. Fiscal reforms (1924-26) and the suppression of municipal democracy protected property income, while the corporatisation of unions and the dissolution of cooperatives erased the arenas through which labour could contest rent distribution. Urban renewal and the 1934 *Albertini Plan* multiplied land values and institutionalised speculation as planning. New real-estate corporations tied to banks joined the aristocracy, integrating rent extraction into the corporatist bloc.[16] The city centre became both a financial machine and a symbolic space of order under State protection.

Labour was made dependent through scarcity – by restricting public provision and removing rent controls. In 1910 blue-collar workers made up 67% of tenants in public housing; by 1927 their share fell to 47%. Of the public-housing projects approved between 1926 and 1931, 13 of 22 were built for rent-to-own tenants.[17] Housing's share in workers' budgets rose from about 3% in 1920 to 15% in the early 1930s.[18] Rising rents, long commutes, and eviction threats deepened subordination, while *case a riscatto* for clerks and civil servants created a loyal petty bourgeoisie. Welfare bodies such as the *Ente Comunale di Assistenza* (1937) institutionalised fascist paternalism.[19]

[15] Bonfanti, Scolari 1981.
[16] Bardelli 2007.
[17] Franchi, Chiumeo 1972.
[18] Comune di Milano, cit.
[19] Bressan 1994.

Spatially, the compromise produced a dual city: a monumental, sanitised centre – cleared around Cordusio, Via Dante, Piazza Diaz, and Foro Bonaparte – and peripheral belts – Baggio, Niguarda, Lambrate – where working-class households clustered in "minimum houses" and hostels.[20] The 1931 and 1939 anti-urban laws reinforced this geography of dependence.[21] Fascist Milan exemplified an authoritarian recomposition of housing functions: industrial capital absorbed overaccumulation through construction; rentiers renewed speculation; labour was disciplined through housing costs and welfare paternalism; and the State fused these into a clientelist order turning scarcity into an instrument of consent and control.

3.3. *The Fordist Compromise (1945-1980)*

Postwar decades turned Milan's housing regime from an instrument of discipline into a pillar of social compromise. The State replaced coercion with mediation, using dwelling to stabilise accumulation and reconcile labour's reproductive and emancipatory claims. The war-torn city became the emblem of Fordist urbanisation, where production, welfare, and mass consumption converged.

After 1945 industrial employers reasserted primacy. Milan's mechanical, chemical, and automotive sectors relied on massive inflows of labour from the countryside and the South. To sustain competitiveness, the State had to ensure cheap housing. The INA-Casa plan (1949-1963), conceived by the Christian Democrats also as a counterweight to the PCI, embodied this logic: a Keynesian programme generating employment in construction while providing modest dwellings for industrial workers.[22] Financed through compulsory payroll levies shared by employers and employees, it tied wage policy to building output and integrated housing into the Fordist cycle. Over forty thousand units rose near factories in the northern and eastern belts, stabilising a low-cost workforce and stimulating demand; in the early-1960s boom Milan built 10-20 000 dwellings annually.[23]

[20] Cerasi 1973.

[21] Treves A. (1986), 'La politica antiurbana del fascismo e un secolo di resistenza all'urbanizzazione industriale in Italia', in Mioni A. (ed.), *Urbanistica fascista*, Milan: FrancoAngeli, pp. 312-330.

[22] Di Biagi 2001.

[23] Comune di Milano, cit.

For rentier interests, the compromise was secondary but ultimately advantageous. Initially forged between labour and productive capital, it eventually revalued property. Rent control (1947) limited short-term returns, but suburban expansion and partial tertiarisation of the centre restored profitability.[24] As Indovina noted, the rentier bloc re-emerged less by design than as a by-product of Fordist growth.[25] What began as a dual pact evolved into a triangular one in which landowners slowly regained structural power.

For labour, in a context of industrial expansion and social development, access to housing became crucial for both reproduction and emancipation. The GESCAL programme (1963-1978) – conceived to phase out the INA-Casa stock by turning tenants into homeowners while financing new dwellings through payroll taxes shared by workers and firms, and built by municipalities, cooperatives, and private developers – was meant to facilitate the gradual withdrawal of the State from housing provision. As industrial employment peaked and Milan's population reached 1.73 million in the early 1970s, it proved inadequate and insufficient: housing became a major battleground. Rising rents and speculative sprawl fuelled militancy: the PCI, tenants' associations, and extra-parliamentary left groups secured redistributive reforms. The 1968-71 rent strikes led to the 1971 law renewing rent control and expanding public provision.[26] The working class could no longer be pacified through scarcity; it had to be integrated through rights and welfare. Caught between Cold War geopolitics and domestic conflict, the State mediated. Housing welfare served as both anti-communist consensus and effective-demand management. New estates – Quarto Oggiaro, Gratosoglio, Gallaratese – were functional to production, redistributive in intent, and politically stabilising.

By the mid-1970s inflation and industrial restructuring eroded the compromise, while speculation resurfaced under the rhetoric of modernisation. Yet until the early 1980s Milan's housing regime still embodied Fordist mediation: industrial capital sustained accumulation through public investment and low reproduction costs; labour gained welfare through collective power; and rentier capital profited from urban valorisation.

[24] Gabellini Morandi, Vidulli 1980.
[25] Indovina 1971.
[26] Agustoni, Rozza 2005; De Caro 200.

3.4. *Neoliberal Milan: Rent, Finance, and the New Urban Regime*

Since the 1980s, Milan has progressively evolved into a rent-driven urban regime. Within thirty years, the city lost more than 400,000 inhabitants. Factory closures in Bicocca, Bovisa, and Lambrate, together with the rise of services, transformed its social composition. The ebb of class conflict and the ideological triumph of neoliberalism opened space for a new alliance between rentiers and a growing petty bourgeoisie.[27] From the outset, construction acted as a compensatory circuit for surplus capital, re-channelling investment into urban land and transforming vacant or devalued industrial areas into sites of financial valorisation and symbolic prestige, epitomised by new office districts and residential complexes. The *Milano da bere* years – centred on the Craxi–Berlusconi nexus and the construction of Milano 2 and Milano 3 – condensed the early stage of this transformation: deregulation, clientelism, and speculation intertwined, while the rise of private media helped forge a new hegemony based on homeownership as a promise of mobility and self-realisation.[28] Housing became the ideological and material foundation of a cross-class consensus, binding labour to debt and property.

In the 1990s–2000s, crisis and austerity dismantled that inclusive promise. The end of rent control (Law 431/1998), the replacement of IACP by ALER, and the rise of public–private partnerships fused finance and real estate into a single circuit of accumulation. For labour, reproductive costs – less powerfully restrained by the interests of large employers, whose number and political weight declined as the city deindustrialised – soared as wages stagnated, while the ideology of ownership deepened divisions between those who gained from rising property values and those who bore their costs. After 2008, foreign investment funds and global developers entered Milan through megaprojects such as Porta Nuova, CityLife, and Expo 2015, completing its financialisation. In this phase, the speculative function was reframed around image-making and urban attractiveness: land and architecture became vehicles for branding the city as a safe asset for international capital.[29] From clientelist inclusiveness to elite accumulation, Milan turned into Italy's paradigmatic neoliberal metropolis – where housing fuses accumulation, debt, image, and inequality.

[27] Kaika, Ruggiero 2016, pp. 3-22.
[28] Cousin 2014, pp. 41-60; Foot 2003.
[29] Tozzi 2023.

4. *Conclusion*

Milan's trajectory shows how class relations, under shifting structural conditions, reorganise the city's material and institutional form – law, planning, credit, and welfare – turning the housing question from a symptom into both an instrument of capitalist transformation and a field of power where social reproduction is continuously renegotiated.

This article has proposed a framework that reconnects housing studies to the dynamics of capitalist development by integrating class relations with the multiple functions of dwelling. By distinguishing between reproductive, emancipatory, productive, and speculative functions, it outlines an approach that helps overcome the separation between macro-theoretical accounts of urban accumulation and historically grounded analyses of housing regimes.

In this perspective, housing cannot be understood as a fixed institutional domain or as a residual outcome of market and policy arrangements, but as a shifting field of class struggle in which alliances and conflicts among workers, employers, and rentiers are continuously rearticulated across different phases of capitalism.

The Milan case should therefore be read not as a definitive empirical test, but as a first, necessarily partial application of this framework. The analysis presented here forms part of a broader empirical research project on Milan's housing regime, to be developed through a series of more detailed studies aimed at systematically reconstructing the transformations outlined in this paper.

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Spatial Justice, Barriers and Segregation: The Case of Ubatuba

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Abstract

This study examines the role of urban barriers in shaping patterns of spatial injustice and reinforcing segregation among vulnerable populations. Drawing on the theoretical foundations of spatial justice established by Lefebvre, Harvey, and Castells, the research explores how capitalist-driven urbanisation and land speculation consolidate unequal access to urban space. Using the Rio-Santos motorway as a case study, the analysis focuses on the municipality of Ubatuba (São Paulo, Brazil), where census data from IBGE (2022) were spatially mapped to assess three dimensions of vulnerability: income, race, and literacy. The results reveal a spatial segregation pattern in which wealthier, predominantly white and highly literate populations occupy the coastal plain, while low-income, black and brown, and less literate groups are concentrated in areas constrained by multiple physical barriers such as hills, rivers, and major roads. The study shows how these barriers not only function as a separator of vulnerable groups but also as a structuring element used to isolate high-end gated and open condominiums, intensifying socio-spatial fragmentation. These findings highlight the complex interplay between infrastructure, land speculation, and social vulnerability, raising critical questions about whether contemporary urban planning can overcome entrenched morphological and socioeconomic barriers to foster more inclusive and equitable urban development.

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Keywords: Spatial Justice, Urban barriers, Segregation, Speculation, Spatial Fragmentation

1. *Introduction*

Justice and space have been discussed together since the second half of sec. XX. As no process takes place homogeneously in space, the way society settles in a territory seems to carry intrinsic patterns of inequality. The problem of injustice appears when those penalties are systematically pushed over a specific part of society.[1] The concentration of spatial disadvantages over a group bounded by one (or many) characteristics usually means that this population is clustered in certain parts of the territory. This is a well-known process that materialises in the urban space as segregation[2]. Although the separation of these communities can be social and psychological, it is often catalysed by physical components, such as urban barriers, which act as boundaries between different social and urbanisation patterns. These elements can be the result of human intervention, such as roads and large infrastructures,[3] or even drawn by natural objects, like rivers and mountains.[4]

[1] Soja 2010.
[2] Lefebvre 1968; Harvey 1973.
[3] Graham & Simon 2001.
[4] Kostof 1991.

This study aims to analyse the role of motorways as promoters of spatial injustice, especially due to their effect on the segregation of vulnerable populations. To do so, it takes the case study of Ubatuba, São Paulo, Brazil, which is crossed by the Rio-Santos motorway.

2. *Theoretical framework: spatial justice, social vulnerability and urban barriers*

The justice concept employed in the urban environment emerged in the 1960s in a movement led by Henri Lefebvre,[5] with the well-known work "Le Droit à la Ville". This publication further influenced many scholars, such as David Harvey[6] and Manuel Castells,[7] who, together, constitute the traditional theoretical foundation for discussions of spatial justice.

The initial approach aimed to give a spatial dimension to the Marxist theory, grounding its discussions on the urban fabric. David Harvey's work, for example, focuses on understanding how urbanisation became an object and tool for fixing the capital surplus held by the wealthiest. This new city controlled by private agents also has a new dynamic of capital flow, which defines the spatial relationship between classes[8].

With these authors, for the first time, urban spatiality was perceived as a materialisation of social relations, rather than just a set of physical characteristics. As a consequence of this social foundation, they argued that the manipulation of space was systematically incorporating the dominant classes' interests, which inevitably led to an uneven production of the city[9].

As this traditional view of spatial justice has deep Marxist roots, it understands the production of unjust cities as a consequence of a neoliberalist operation model. In this model, housing markets and land development are governed by private interests, envisioning more capital accumulation.[10] In line with the Marxist tradition, land becomes a

[5] Lefebvre 1968.
[6] Harvey 1973.
[7] Castells 1977.
[8] Harvey 1985.
[9] Harvey 1973; Harvey 1985; Lefebvre 1968.
[10] Harvey 1973.

highly valuable means of housing production, but it is linked to space and its consequences, which differ from capital. The government, in turn, is either supportive or omissive about private takeover, which leads to the materialisation and perpetuation of the power relations established in everyday urban life.[11]

One of the spatial consequences of this model is segregation, which can be understood as the physical separation of a population within the urban fabric, often based on characteristics such as race, ethnicity or income.[12] Segregation often means limited access to education, health, leisure, adequate housing, citizenship, and political rights to the vulnerable population, which is precisely what Lefebvre (1968) described as the "right to the city".

In neoliberalist logic, land becomes an asset rather than a right. To fulfil this profit-driven role, the agents shaping the city employ spatial production mechanisms to increase the land's value progressively. One common mechanism is the unequal allocation of resources, which creates high-standard areas inside the city, fostering a speculative process[13]. The speculative process triggers gentrification, as rising property values displace the original community and attract wealthier residents.[14]

Although the division can be social and psychological, segregation often leverages morphological components, such as urban barriers. Urban barriers are physical elements that can be both artificial, such as roads and other large infrastructures,[15] or natural, like rivers and mountains.[16] These elements often act as boundaries between different social and urbanisation standards, creating a fragmented city.

Spatial justice, in this context, revolves around the relation between gentrification-segregation and their relation with morphological elements. In other words, the gentrification caused by land speculation is a driving factor of segregation, which, in turn, can be influenced or delimited by urban barriers.

[11] Lefebvre 1968.
[12] Castells 1977.
[13] Harvey 1973; Rolnik 2019.
[14] Smith 1979, pp. 24-35.
[15] Graham & Simon 2001.
[16] Kostof 1991.

3. *Case study: Road development at the São Paulo coast*

Urbanisation on the São Paulo coast officially started in 1532 with the foundation of São Vicente village, the first Brazilian city. The urban development in the area evolved slowly and inconstantly, expanding its towns, strengthening its harbours, and changing agricultural production from subsistence to exportation[17].

The increasing agricultural market induced the opening of some stone-paved paths for production flow around 1790. With the coffee production success, more efficient ways of transporting goods led to the construction of a railway network that started in 1867. This revolutionary prospect left the already opened paths poorly used, and also slowed down the construction of new ones. In the 19th century, the connections in Brazil were mainly constituted by the scarce opening of paths on demand, without any big-scale plan or network logic. In 1904, São Paulo city had only 84 cars, used basically as a luxury item to move around the city[18].

Despite the negligible number of cars, the 'Rational Road Plan for the State of São Paulo' was published in 1913, and motorway development flourished in the state. This document would become the technical, financial and regulatory basis for what is today known as the "rodoviarismo", a concept used to describe the systematic promotion of road transport and all its demanding infrastructure as a symbol of modernity. After the document, the motorway cause started to be promoted in Brazil, and São Paulo was put as a pioneer state and example.[19]

Considering its context, it can be said that the Road Plan was a tool to stimulate motorway opening and car use, envisioning to boost the automotive market in the country. The attempt was successful, as this movement expanded and improved old connections and established the automotive industry in Brazil. At this point, trucks started to replace the freight trains, and the importance of the motorways was consolidated. In 1936, São Paulo drew a new State Road Plan, and the network was once again expanded and modernised. Efforts were

[17] Ribeiro 1995; Ribeiro 2004; Papali, Olmo & Almeida 2015.

[18] Caminhos do Mar; Candeias 2003; Portal do governo 2004; Huertas 2022, pp. 1-28.

[19] Huertas 2022.

combined to build new roads, continuing the long-standing project of connecting the interior to the coast. As these efforts focused on logistical issues, connections were limited to reaching the port of Santos. It was not until 1970 that a pioneer infrastructure was constructed to go beyond Santos, invading the still poorly explored north coast,[20],[21].[22] This road was the famous Rio-Santos motorway, and constitutes the urban barrier that is the subject of this analysis (figure 1).

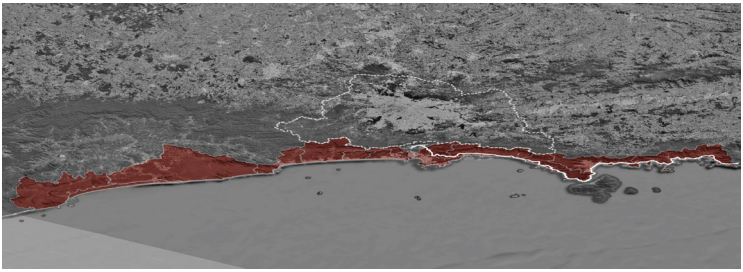

Figure 1: São Paulo coastal municipalities, São Paulo metropolitan area and Rio Santos motorway. Source: Google maps (2025), organised by the authors

The researcher Marina Fontanelli dedicated her work to studying the impacts of Rio-Santos on the communities inhabiting the coast. She reports the motorway as a Pharaonic work of the Dictatorship period, and as "a scar that never heals"[23].

4. *Methodology*

The present study takes the case of the Rio-Santos motorway at the point where it crosses the municipality of Ubatuba, in the north coast of São Paulo State (Brazil), to analyse its role in the segregation of vulnerable populations. Although vulnerability is a broad concept and can include many aspects, three of them were selected: income, race and literacy.

[20] Caminhos do Mar.
[21] Portal do governo 2004.
[22] Huertas 2022.
[23] Fontanelli 2019; Motoryn 2023.

To carry out the analysis, the study relies on the spatialization of census data. The data were obtained from the last census in Brazil,[24] which provides information in tables with the variables at the scale of the census sector. The variable used for income was "V06004", which informs the average monthly household income by census sector. To calculate the percentage of black and brown people, the variables "V01318" (number of black people in the census sector) and "V01320" (number of brown people in the census sector) were summed and weighted by the total number of people in the census sector. Finally, to calculate literacy levels, the variable "V00901" (number of people with more than 15 years who don't know how to read or write) was used, and, as in the previous case, weighted by the total number of people in the census sector. The average income and percentage of black and brown, and illiterate people were spatialized and mapped using GIS software.

5. *Results: Vulnerability and Urban Barriers: The Case of Rio Santos motorway in Ubatuba*

The construction of the Rio-Santos motorway served two main purposes. Firstly, it was a key element in the composition of a road network, responsible for the flow of production and facilitating access to a number of infrastructural projects in the area. Secondly, it aimed to foster tourism throughout the coast between Santos and Rio de Janeiro, attending to an identified but unexplored potential.[25]

The project's studies poorly reported the area's occupation conditions, and often referred to the territory as 'practically uninhabited' or 'untouched'. The motorway was publicised as a colonisation and development tool, and was supported by government, companies and entrepreneurs interested in the real estate business[26]. This image of uninhabited lands, however, ignored the existence of hundreds of families that lived in the area for decades, known as "caiçaras"[27].

[24] IBGE 2022.

[25] Embratur 1975.

[26] Brasil 1973; Embratur 1975.

[27] The caiçaras are traditional communities that live in the Brazilian coastal areas, practise a subsistence economy based on farming and fishing, with specific culture and traditions and emotional ties to the sea. Given Brazil's intense racial mix and the history of the territory, the caiçara people emerged from a confluence of genes and traditions of Indigenous, African and European people. Also, see Marcílio 1986.

A survey carried out with fishermen at the time revealed that around 80% of them were optimistic about the motorway construction, and believed it would bring improvements to the area.[28] However, the exponential increase in land prices that it brought imposed a new property dynamic. People living in the area were pressured and threatened – through legal or illegal means – to sell their properties, many times for underestimated prices[29].

The lands that were previously home to the caiçaras became an asset for multinational corporations. The developments were mainly tourist gated communities and resorts, which also intensified urbanisation. The caiçaras were forcibly displaced to marginal areas and suffered from the deprivation of their lifestyle, whether due to legal restrictions or lack of resources[30].

Fontanelli (2019) says that the motorway imposed a type of apartheid, where only wealthy houses are allowed on the beach side, and the people who insist on living in the territory have to be squeezed between road and hills, lacking infrastructure and exposed to environmental risks[31].

The present work investigates traces of this segregation by analysing the spatial distribution of three social vulnerability characteristics, namely family income, race, and literacy in the municipality of Ubatuba (SP). Figures 2, 3 and 4 show the centre area of the Ubatuba municipality, the mentioned vulnerability analysis, and their relation with Rio-Santos and other barriers.

[28] Diegues 1974.
[29] Siqueira 1984; Feitosa & Silva 2015; Fontanelli 2019.
[30] Sabino 2012; Siqueira 1984; Feitosa & Silva 2015; Fontanelli 2019.
[31] Fontanelli 2019; Motoryn 2023.

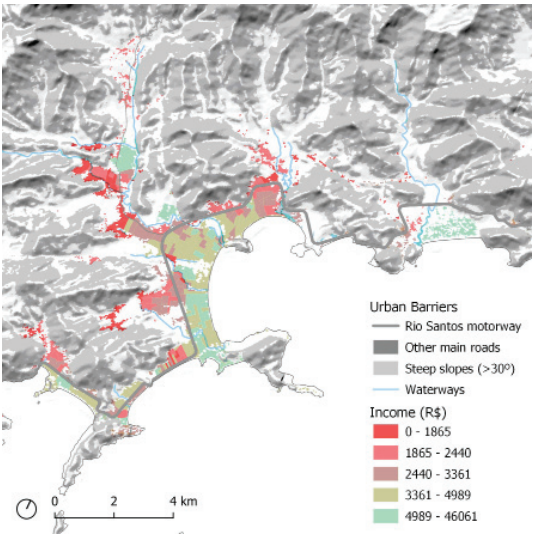

Figure 2: Family income distribution in Ubatuba, SP, Brazil, in reais, divided per quintiles. Source: IBGE (2022), OSM (2025), organised by the authors

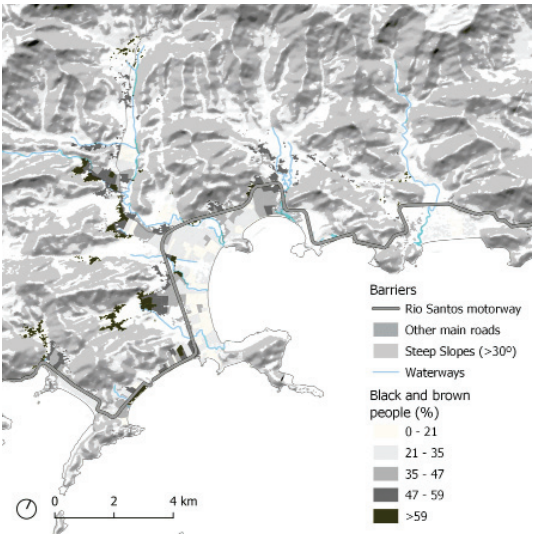

Figure 3: Black and brown people distribution in Ubatuba, SP, Brazil. Source: IBGE (2022), OSM (2025), organised by the authors.

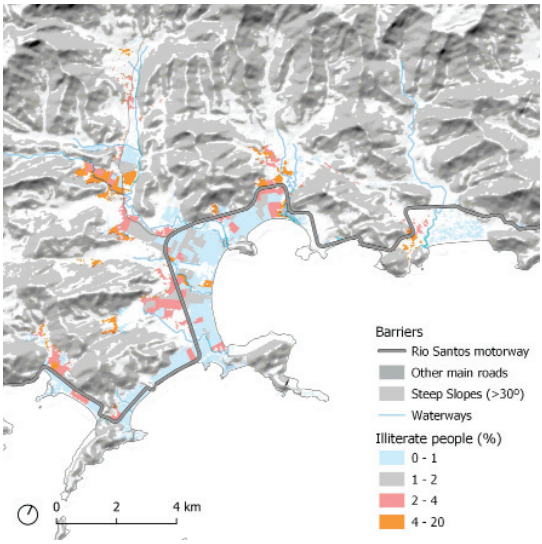

Figure 4: Illiterate people distribution in Ubatuba, SP, Brazil. Source: IBGE (2022), OSM (2025), organised by the authors

The three chosen vulnerability variables show the same spatial distribution pattern, and, therefore, are analysed together. This is an expected result, as families with low incomes also tend to be the least literate, and, in the case of Brazil, these characteristics are also most prevalent in black and brown communities.[32]

Figures 2, 3 and 4 show a clear pattern of segregation. The plain areas between the sea and Rio-Santos are almost restricted to white families with the highest incomes and literacy rates. This finding illustrates the motorway's role as a clear barrier segregating people with vulnerable characteristics. Deviating slightly from the observed pattern, there are some census sectors of greater vulnerability permeating the area between the sea and the motorway. Most of these sectors appear to be spatially related to some other barrier, such as rivers, hills, and other important roads. In particular, the most vulnerable sectors tend to occupy narrow valleys between hills and, secondarily, are also attracted to these other dividing elements. Spatial analysis shows that the combination of these barriers seems to form a network, creating

[32] IBGE 2022.

segregated areas that function as vulnerability traps. This phenomenon was already reported by Santos et al., (2022) in the delta of the Jacuí River area.

However, it is also interesting to notice that this barrier network, in some cases, also functions to isolate the least vulnerable populations, configuring a self-imposed segregation. This is the case of the two condominiums pointed out in Figure 5.

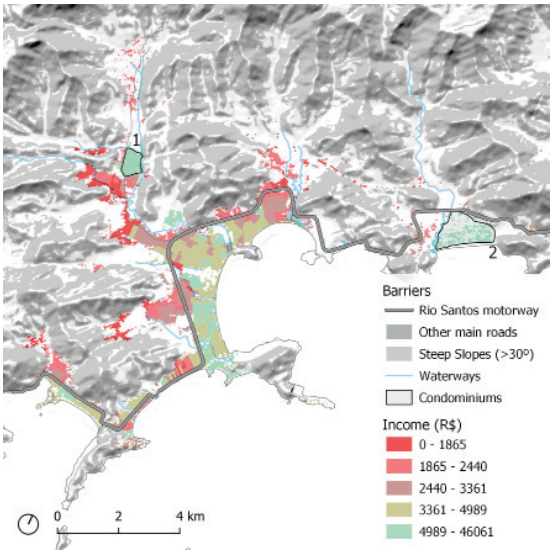

Figure 5: Condominiums in Ubatuba, SP, Brazil, and their relation with family income. Source: IBGE (2022), OSM (2025), organised by the authors.

In both cases, the condominiums are isolated by rivers, hills and motorways. Polygon 1, as a combination of gated communities, is also segregated by walls, while polygon 2 is an open condominium that allows access to the beach. They concentrate wealth spatially, while their immediate surroundings are highly vulnerable in three aspects (income, literacy and race).

In addition to the spatialisation of the data, this contrast between condominium 1 and its surroundings can be seen in the photos of the surroundings (figure 6), shown in figures 7 and 8.



Figure 6: Condominium 1. Locations of figures 7 and 8. Source: OSM (2025), organised by the authors



Figure 7: Street in front of the condominium 1gatehouse in Ubatuba, SP, Brazil (point A). Source: Google maps (2025)



Figure 8: Street next to gated community 1 in Ubatuba, SP, Brazil (point B). At the end of the street, the condominium walls. Source: Google maps (2025)

Condominium 2 is located in the Itamambuca neighbourhood, an area far from the city centre with a strong environmental preservation culture, nominated as the first Brazilian National Surfing Reserve.[33] Figure 9 zooms in on this area of the Ubatuba municipality and shows the locations of the following pictures (Figures 10 and 11).

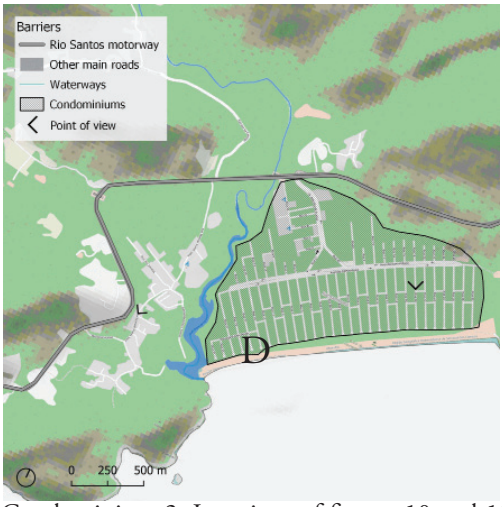

Figure 9: Condominium 2. Locations of figures 10 and 11. Source: OSM (2025), organised by the authors

[33] Reservas de Surf.

The map shows the neighbourhood distribution, in which the plain area with access to the beach is dedicated to the Itamambuca condominium (2). The Itamambuca village is right next to it, between the mountains, the river and the Rio-Santos motorway. To access the beach, villagers must either walk around and through the condominium (a longer distance) or cross the river.

As the condominium is open, it is possible to see the landscape inside it (Figure 10), and compare it to the landscape of Itamambuca village (Figure 11).



Figure 10: Street inside the condominium 2 gatehouse in Itamambuca neighbourhood, Ubatuba, SP, Brazil (point C). Source: Google maps (2025)



Figure 11: Street in Itamambuca village, Ubatuba, SP, Brazil (point D). Source: Google maps (2025)

The layout of the condominium is more rational, with wider, straighter streets, and large setbacks or facades covered by vegetation. The village, in contrast, has a more organic street layout, narrower sidewalks, facades closer to the street and some local shops. The condominium conveys an image of empty streets and tranquillity, while the village appears to be denser and busier.

Both places (village and condominium) have high rates of secondary residences and tourist accommodation. Spatial data, in turn, provides information about permanently occupied private homes, which in this area correspond to a small proportion of properties.[34] The high levels of vulnerability experienced by residents of the village of Itamambuca may be further exacerbated by the fact that they are surrounded by high-end tourist residences.

The case of Ubatuba shows how the Rio-Santos motorway, together with other dividing elements in the territory, acts as a factor in the segregation of vulnerable populations. Furthermore, the case study also suggests that property speculation seems to take advantage of these elements to isolate high-end developments.

6. *Conclusion*

In Ubatuba, analysis of census data reveals that the spatial distribution of the population is not equipotential. The patterns of vulnerability overlap across the three analysed variables – income, literacy and race – which are physically influenced by the aforementioned barriers. Indeed, urban barriers such as the Rio-Santos motorway form part of the boundaries of condominiums from the inception of those settlements. This is intrinsically related to what Harvey (1985) and Soja (2010) pointed out: not only are land use patterns heterogeneous, but capital agents use them as assets. Therefore, the relationship between barriers and vulnerability is not accidental, but rather forms part of a complex interplay of cause and effect.

Moreover, the Ubatuba case is not an isolated one. Along the São Paulo coast, particularly in areas crossed by the motorway, analogous patterns of segregation are evident. So, the question remains: can we change the course of this segregative urban development? Can new urban planning mix communities and overcome barriers.

[34] Valentin 2017.

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Materializing Abstraction: Marxist Approaches to Photography in the Anthropocene

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Abstract

Marx's analogy in Capital – imagining "the animal" as the abstract equivalent of all animals walking among its particular forms – illuminates the aesthetic challenge of abstraction at the heart of the commodity form. This paper argues that such abstraction has gained renewed urgency in the Anthropocene, when human activity now materializes as climate and environment. Photography, long celebrated for its access to the concrete, must confront this new task: rendering visible the abstract structures that mediate material reality. Drawing on Alfred Sohn-Rethel's notion of "real abstraction," the paper outlines a materialist approach to photography capable of grasping the dialectic between the abstract and the concrete. Three contemporary photographers exemplify this negotiation: Fazal Sheikh, whose desert landscapes of the Negev/Naqab register histories of displacement and eco-colonialism; Richard Mosse, who visualizes border regimes and ecological devastation through technologically mediated imagery; and Allan Sekula, whose maritime investigations reveal the hidden circuits of global capitalism. Together, these works articulate how photography might "materialize abstraction," making perceptible the systemic forces shaping the planet in the Anthropocene.

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Keywords: Real Abstraction, Photography, Anthropocene, Dialectical Realism, Representation

> In the past, harbor residents were deluded by their senses into thinking that a global economy could be seen and heard and smelled. […] Things are more confused now.
> What one sees in a harbor is the concrete movement of goods. This can be explained in its totality only through recourse to abstraction. Marx tells us this, even if no one is listening.
>
> Allan Sekula, Fish Story

Grasping the abstract might be considered one of art's biggest – perhaps even insurmountable – challenges. Phenomena such as global capitalism and the climate crisis are not only peculiar "objects" that are "too abstract" to be perceived directly but entities in which abstractions, as such, play a constitutive role.

The phrase "too abstract" is commonly employed both as a descriptive statement, referring to a quandary posed for representation, and as a normative judgment, denouncing that which makes these phenomena oppressive and objectionable in the first place. A complex alienation is supposedly to blame for cutting us off from our everyday lives, our rooted, down-to-earth attitudes and experiences. However, a close examination of the terms "abstract" and "concrete", particularly through a Marxist framework, reveals a far more complicated picture that speaks to fundamental philosophical and aesthetic questions. The work of Allen Sekula, a photographer of the global maritime industry who provided the epigraph to this talk, along with the photo projects of Fazal Sheikh and Richard Mosse, negotiates the epistemological challenges that an aesthetic engagement with and critique of abstraction needs to circumnavigate in the age of the Anthropocene.

To start, let's take a step back: What is abstraction? A long philosophical tradition, much in line with the term's etymological roots – *abstrahere*, meaning to drag away from or remove forcibly – understands abstraction as an exclusively mental process, based on intellectual faculties such as generalization and classification. In a Kantian universe, the act of abstraction is differentiated from perception, which is the realm of the sensuous. The modern philosophical discipline of *aesthetics,* developed by Alexander Baumgarten, came to posit and defend sensual perception against the thrust of rational thinking. In these logics, abstractions are understood to have a fundamentally different ontological status than the phenomena we perceive with our senses – and hence, what is abstract cannot be seen. This relates to the

infamous problem of universals, where the ontological status of "general" things, of which particular things are instances, has been debated since the beginning of philosophical thought.

It is none other than Marx who throws a wrench into this century-long debate. In his well-known opening of *Capital*, Marx describes the contradictory character of the commodity, the cell-unit of capitalism, as a "sensuous super-sensuous thing [*sinnlich-übersinnliches Ding*]", whose peculiar character becomes most evident in the form of money.[1] The owner of a coin holds a concrete universal in her very hands, as repeatedly proven by its universal exchangeability with whatever the buyer finds on the shelf. Alfred Sohn-Rethel made this counter-intuitive reshuffling of the classical philosophical distinction between realism and nominalism the focal point of his Marxist investigation by coining the term "real abstraction". The latter provocatively fuses two hitherto distinct philosophical realms: "While the concepts of natural science are thought abstractions, the economic concept of value is a real one. Value exists nowhere other than in the human mind, *but it does not spring from it.*"[2] According to Sami Khatib, it is Sohn-Rethel's concept of real abstraction that collapses the split that is constitutive for a Kantian conception by showing how the separation between "the sensuous (aesthetic) and the non- or supra-sensuous (intellect)" becomes short-circuited in a peculiar entity – the commodity.[3]

Much can be said about when, how, and to what extent this real abstraction emerges (for Sohn-Rethel, a qualitative shift occurred in 700 BC, when the Greeks, in the midst of their maritime trade network, began to coin money). What is of interest in my talk, however, is how the world that the capitalist mode of production created – and violently enforced upon the globe, its inhabitants, *and* their environment – continues to pose particular problems for aesthetics and artistic endeavors precisely because any attempt to represent such a world via sensuous means alone is met with deadlock.

Perhaps in no other medium does this problem become as apparent as in photography. Early theories of photography celebrated the camera as an apparatus that objectively "senses" the natural and mate-

[1] Marx 1962, p. 85 [my translation].

[2] Sohn-Rethel 1978, p. 20 [my emphasis].

[3] For a comprehensive overview of the concept, see Khatib 2021 and Khatib 2017.

rial world in front of its lens and that mediates sensuous data purely through mechanical means, devoid of any intellectual or conceptual distortions. However, if the world in front of the camera is itself structured by abstractions – that is, by abstractions that are real in a peculiar Marxist sense – then the issue of representation becomes infinitely more difficult. This is the kernel of Benjamin's insight, via Brecht, regarding a photograph of a factory: "less than ever does the mere reflection of reality reveal anything about reality."[4] Here, however, the concept of real abstraction highlights that it is not simply an illusion or ideological veil covering how things really are, but rather that things themselves stand in the way of perceiving the sensuous-supersensuous relations of capitalism.[5] Since "actual reality has slipped into the functional", as Benjamin (via Brecht) argues, a "construction" is needed to make this peculiar dimension apparent.[6]

Hence, reality cannot be found at a different place or scene, such as by simply depicting the visceral hardship of an exploited worker or the brutal destruction of a natural landscape (even if both are perpetually made invisible).[7] There is neither a hidden world behind appearances nor is the sensuous-empirical data meaningless. Instead, there is something that shows itself in the empirical world but in a peculiar, displaced manner. We could say, to borrow Brecht and Benjamin's terminology, that the very slippage itself is operative at the functional zero level of capitalism, which is a mode of production that seemingly magically creates surplus value out of a simple exchange of equivalents. Here, the critical and aesthetic task is to stage how such a glitch is conditioned on the abstracted units that constitute the totality of capitalism, a totality which includes a mediation and rupture with nature.

How, then, can we represent, portray, picture, or stage abstraction as abstractions active and operative *in* the world? A specific kind of realism of abstraction is needed. Photography is of particular interest here because it operates on several different thresholds. It has been theorized as a realist medium par excellence in the sense that the photographic image is understood as an indexical trace of, and perhaps

[4] Benjamin 1999, p. 526.
[5] Khatib 2021.
[6] Benjamin 1999, p. 526.
[7] Sekula polemically calls this futile and ultimately misguided approach "the find-a-bum school of concerned photography". Sekula 1978, p. 867.

even ontologically identical with, what it depicts. Others, however, have argued that there is an absolute distinction between the two. No matter how closely a photograph approximates its referent, it is, ultimately, "only" a representation, the ideological mystification of which one must guard oneself against. The theoretical quandary between these two poles is mirrored in the perpetual "epistemological anxiety about photography itself", a medium that, from its inception, fluctuates between creative practice and documentary journalism, without ever finding its place in classical dualisms such as science/art, truth/falsehood, or stasis/narrative.[8]

A historical example of this perpetual border crossing of medial thresholds can be found in Naples, where Sohn-Rethel and Benjamin, along with other staple figures of Marxist critical theory such as Adorno, Krakauer, and Bloch, contemplated a Mediterranean paramodernity and technology. The sliding between natural and cultural history, which the group was conceptualizing at the time, becomes emblematic in their visit to the aquarium of the *Stazione Zoologica* in 1925. The path-breaking research institute, established in 1872, stands at the origin of modern biology and its notion of "milieu" that prefigures our contemporary ecological paradigm.[9] By way of a revolutionary architectural feat, the building in which the institute is still housed today connected its laboratories directly with the seawater flows of the adjacent ocean (Figure 1-2). As such, it resonates with one of the famous philosophical notions that Benjamin developed in conjunction with Sohn-Rethel against the backdrop of the Neapolitan city: the concept of porosity.[10] Photography – one could say – mobilized porosity in the most emblematic way: a technical process that utilizes a perforated spatial enclosure by combining the physics of optics and the chemistry of emulsions – the liquid and the crystalline – in an assemblage that allows for capturing abstractions in a hitherto unseen and concrete way, such as in the case of the chronophotographic experiments of the French scientist and physiologist Étienne-Jules Marey at the very zoological station (Figure 4-6). Mary developed a surprising bricolage of existing technologies during his time in Naples, like the "photographic gun" (Figure 3). The photographic

[8] Chaudhary 2019, p. 96.
[9] Wessely 2020.
[10] Benjamin & Lacis 1972.

breakdown of animal and human movements enabled the capture of their abstract – and, to evoke Benjamin once more, the investigation of their "optically unconscious" dimension (Figure 7-8).

The concept of "real abstraction", I want to argue, allows us to re-articulate and, in a sense, sidestep the deadlock between the two exclusionary theoretical positions *vis-à-vis* photography described a moment ago. We might argue that photography indeed inhabits the same world as its referent, but that the distance – the gap between the photograph and its referent – also pertains to the gap inherent in the referent itself when it comes to capitalism. A world traversed by real abstractions is a world in which the referent is not identical with itself – a distance (abstraction as "removed from") is operative in things and people entangled in social relations that are mobilized and exploited by capitalism in specific ways – that is, by a "mute compulsion" rather than direct (observable) coercion.

But how can we get a hold of a phenomenon like capitalism and its "real abstraction" without falling into the traps of vulgar empiricism or symbolism? How can we avoid both the transhistorical view from above, that detaches, *ab-stracts* itself from what it sees and subsumes below, and the fantasy of immersion in a supposedly "real", "authentic", concrete immediacy? The work of three photographers engages with abstraction in ways pertinent to this discussion.

Fazal Sheikh's *Desert Bloom* photo series from 2015 explores the consequences of the modern dream of conquering a supposedly empty space.[11] The Negev/Naqab desert is the object of aerial pictures that reveal the myriad forces and actions that have blossomed to displace and erase the Bedouins who have lived in the desert for generations. We can view the transformation wrought on the landscape by erosion, mining projects, afforestation efforts, and the expansion of settlements (Figure 9-10). Sheikh's camera presents the desert itself as an archive. What is hidden and sealed within its dunes is negotiated here just as much as the efforts to use the desert to erase the traces of this violent history. Zahid Chaudhary points out the particular status of abstractions in Sheikh's project: "As such, the abstraction of these works is not the kind of abstraction that can be easily opposed to the figural or to the concrete. These images are abstract *and* figural, and they indicate world-historical forces *and* uniquely local histories."[12]

[11] Sheikh 2015.
[12] Chaudhary 2019, p. 94.

One can situate Sheikh's work in a specific genealogy – namely, aerial photography. Soon after its invention, the camera rose into the sky in a literal abstraction from the ground, to capture a bird's-eye view of an increasingly complex world. Before culminating in the iconic "Blue Marble" photograph taken in 1972, aerial photography began with the Frenchman Nadar, who famously photographed Paris from balloons and kites in the 1880s (Figure 11). While it is now known for its use in scientific research, urban planning, and activism, the genre was established through military reconnaissance during World War I. Contemporary with the experiments in abstract art, photographic abstraction was employed for the purpose of war. A 1918 Royal Air Force manual labeled aerial photographs of various landscapes as "Cubist" or "Futurist" to familiarize new pilots with the German countryside they would encounter on their missions (Figure 12).[13] Far from passive observation, such aerial reconnaissance participated in a process where the bombs and artillery shells following in its wake created, in the words of Benjamin, "a landscape in which nothing was the same except the clouds" – an abstract landscape which recursively necessitated further (re-)mapping.[14] The abstraction of aerial image-making, as a process of distancing and removal, meets a landscape as an abstraction, both as an outcome and a starting point for the former.

Against the backdrop of this tainted history, an objection arises: How is a politically invested artistic practice, no matter how strong its self-proclaimed critical ambitions, not destined to reproduce the same violent homogenization that aerial photographs historically and presently reinforce? Zahid Chaudhary makes a case for the contrary by pointing out the "unavoidable contingency" that underlies and informs Sheikh's abstraction in *Desert Bloom*.[15] What (aerial) photography does is *to overlook,* precisely in both meanings of the word: both to look over or at from a higher place *and* to fail to notice or consider, to miss. It maps a territory to achieve orientation and, by extension, mastery. But it equally undermines the effort by unavoidably sliding into an image what eludes its original intent: slips of the camera that speak to the glitches in the abstract territory.

[13] Saint-Amour 2019.
[14] Benjamin 1996, p. 732.
[15] Chaudhary 2019, p. 108.

Here, Sheikh's work resonates with that of Richard Mosse, who engages with similar slippages in concrete abstractions. For his project *The Castle* (2018), Mosse spent years documenting the ongoing refugee crisis, meticulously recording camps located along migration routes into the EU.[16] Repurposing a thermal video camera designed for long-range border enforcement, Mosse captures the camps from high elevations to draw attention to how each interrelates with – or, more importantly, is divorced from – adjacent citizen infrastructure (Figure 13). The source footage of each of these pictures consists of hundreds of individual frames, which are digitally overlapped in a grid formation to create composite heat maps (Figure 14). Cutting into time and space, Mosse's images speak to the lived experience of refugees indefinitely awaiting asylum and trapped in a state of limbo. This technique, however, entails a "mis-measuring" side effect. Though the final picture looks instantaneous, it is in fact non-synchronous. Close examination of the final images reveals repeated glitches, in which bodies that happened to be in motion during the sequential capture of the picture unknowingly crossed a border in the camera's grid.

Here, the glitches of abstraction operative in photography speak to the glitches of very real legal abstractions operative in the anthropogenic landscape the refugee finds herself trapped in. The realism at stake here neither refers to a concrete, immediate fullness nor to higher ideas, laws, or pure forms. A better name for what is at stake in Mosse's project might be called a "realism of the gap," or a realism of the incompleteness of reality. The philosophical underpinning of such a realism would be a "materialism of the hole", where the hole in reality finds an overlap with the hole that is the lens of the photographic apparatus.

Mosse's most recent project, *Broken Spectre* (2022), comprising a series of still images and an immersive film, further explores the porosity between art and reportage characteristic of the photographic medium by focusing on the environmental destruction of the Amazon rainforest (Figure 15-16). Mosse utilizes multispectral cameras, drone technology, and geographic information software to reveal the impact of deforestation, mining, and land exploitation in ways that are both visually striking and deeply unsettling. The work presents the Amazon as a battleground where industrial deforestation, wildfires,

[16] Mosse 2019.

and illegal activities clash with indigenous resistance and fragile ecosystems. Using elaborate technology whose own genealogy is deeply entangled with the extractivist-industrial complex, *Broken Spectre* approaches its representational challenge not only by depicting vast, sweeping, and scarred landscapes but also, more importantly, by shifting between and colliding vastly different scales: disembodied bird's-eye views, human narratives, and microscopic perspectives. Following a synoptic methodology, the project displays a decidedly anti-naturalist approach. The ground level of human imaginary invested with all-too-familiar tropes is present in the recurring black-and-white images of resisting indigenous communities, impoverished local Brazilian cowboys, and forest-burning Bolsonaro supporters reenacting a manifest destiny fantasy. These ideological constellations are part of an entanglement of global economic forces and micro-level metabolisms. To fathom the ineffable of the Anthropocene, its junctions and disjunctions, both the indexical and constructivist dimensions of the medium need to be mobilized.

In *Fish Story*, a book and photo work from 1995, Allan Sekula looks at another space out of sight – the sea.[17] Here, we find ourselves not overlooking from above but rather on a horizontal plane. But this does not mean that we stand on stable ground. Instead, we navigate an ever-shifting surface of global networks and relations traversing the vast surface of the oceans via highways of international trade, containerized cargo shipping, and the maritime exploitation that sustains them.

In the book's two opening photographs, we encounter, in condensed form, the central themes and dialectical structures that characterize the project (Figure 17-18). The first image depicts New York City's harbor, seen through a window on the Staten Island Ferry, with a blurry cargo ship and a barely visible Statue of Liberty in the background. The picture's focus, however, is on a set of binoculars on the inside of the ferry, waiting for a curious spectator to spend twenty-five cents for a view of what we only see hazy and out of focus – the seascape. The second picture on the opposite page shows the same location. This time, we see a boy standing behind the device, though not looking through it, while holding a brown shopping bag, the contents of which, we are inclined to infer, most likely consist of commodities that were shipped in a vessel similar to that which is out of his view.

[17] Sekula 2018.

It would not be far-fetched to speculate that if the boy had looked through the binoculars, he might have seen another being with binocular vision: one of the whales that occasionally make their way into New York City's waters. Herman Melville's detailed tale of the whaling industry in *Moby Dick* pauses at one moment to imagine what it would be like to see like the giant sea creature – namely, to have the marvelous capacity to perceive two pictures at the same time.[18] We could say the whale is a profoundly dialectical animal, as, to quote Andrew Cole, "dialectic, like the whale, regards two distinct pictures, two different ideas, and combines them into a single thought."[19] Sekula's *Fish Story* very much operates in the spirit of the whale. Throughout the book, a diptych structure creates sequences of oppositions and contrasts that generate a surplus unavailable when we look at individual pictures. This dialectical form is fitting for the fleeting and abstract but nevertheless real object of Sekula's project: To quote his former teacher Herbert Marcuse – the "very structure of capitalism is a dialectical one".[20] *Fish Story* is less a mimesis of this structure than an attempt to instantiate the "photographic construction" Benjamin called for.

Benjamin Young highlights three types of productive oppositions constructed in Fish Story:[21]

1) The contrast between two disparate places and times, as in the view of a small bay showing the remains of an ancient Roman harbor and a view from above a massive steel crane handling cargo containers in LA.

2) The montage of disparate activities like a former shipyard worker seated on the ground scavenging copper from an overturned container counterposed with an autonomous robot-truck hauling cargo in an automated terminal.

3) The doubled portraits, in which either a human figure appears in both frames, or a figure is present in one frame and absent in the next. Those evoke a socio-technical reading since what remains in the frame is the tool, which, in its objectivity, seems to have a greater permanence and visual reality than the transient person. As much as the person at work appears to use the tool, we can also see that the tool shapes the person's acts, postures, and gestures (Figure 19-20).

[18] Melville 1980, p. 320.
[19] Cole 2014, p. X.
[20] Marcuse 1999, pp. 311-312.
[21] Young 2014, pp. 78-107.

The most well-known diptych in *Fish Story* juxtaposes a close-up of a red, arched spirit level on a ship's inclinometer with a panoramic view of the open ocean from a cargo ship's upper decks (Figure 21-22). It can serve as the paradigm for the project as a whole. The inclinometer indicates an imbalance, a tilting of the vessel on the high sea, constantly swinging back and forth between one side and another, much like us, the viewers, oscillating between two pictures in the numerous diptychs, such that "a distrust of the self-sufficient, compositionally unified pictorial tableau" manifests itself.[22] The dialectic at work in Sekula's unique practice allows us to grasp the "unseeable" but effectual abstractions of contemporary capitalism. Sekula's juxtapositions speak to the inherent gaps and fissures in our social fabric, accessible only through their slips and symptoms.

In the 1867 edition of *Capital*, Marx uses a striking image to describe the odd character of money, the general equivalent of all commodities. A real abstraction par excellence:[23]

> It is as if alongside and external to lions, tigers, rabbits, and all other actual animals, which form when grouped together the various kinds, species, subspecies, families etc. of the animal kingdom, there existed also in addition *the animal*, the individual incarnation of the entire animal kingdom.

Could we not say that the standardized shipping container is "the animal" of contemporary global capitalism? Its "natural" habitat would be the sea rather than land. No insight could be gained, however, from simply hunting it down like a photographer of nature, much in the same way that nothing could be understood of our current world by showing images of money. Many of *Fish Story*'s pictures depict this bulky maritime creature. But it is through Sekula's dialectic approach that we come to grasp the effects of its "metaphysical subtleties and theological niceties" (Marx). Its power to shape land and seascapes, to create a second nature to which those, even though they produce the content of these containers, are subjugated, forced to scavenge its leftovers and even seek shelter in its remains. Here, the shipping container constitutes our contemporary milieu (Figure 23).

[22] Young 2014, p. 82.
[23] Marx 1976.

Aristotle, from whom *Fish Story* takes its epigraph, underlines that one does not notice what is closest. It is the milieu in which one dwells that is structurally forgotten, just as water is for a fish.[24] Water is what the fish always sees; it is therefore what it never sees. However, there are ways of considering the milieu while extracting oneself from it, in the same way that a flying fish can leave the water: intermittently. Through this *abstraction*, the milieu is brought into view. The kind of photographic practice elaborated here could be understood as employing the strategy of the flying fish. Neither abandoning the anterior trace that is essential for photography nor innocently affirming the recorded facts as inevitable or natural. Neither the bird's-eye view nor the immersion of the fish alone will suffice. The camera, both part of the world and simultaneously distant from it, can supply us with a realism of abstraction.

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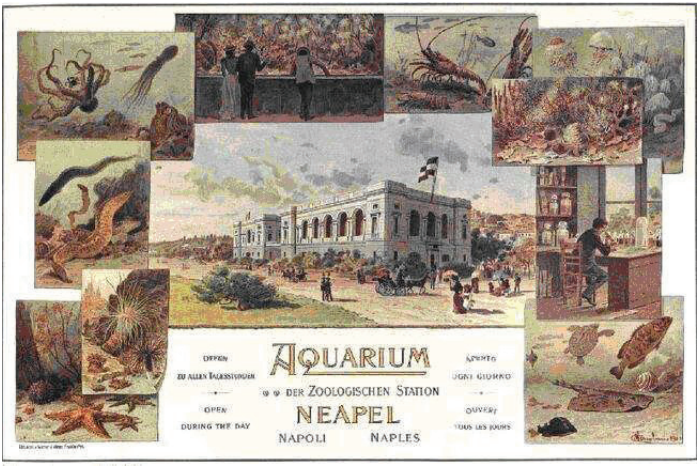
[24] Aristotle 1984, De Anima 423ab ff.


AQUARIUM
DER ZOOLOGISCHEN STATION
NEAPEL
NAPOLI NAPLES





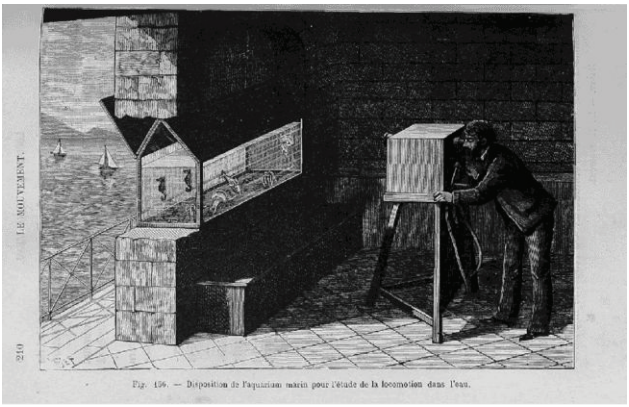
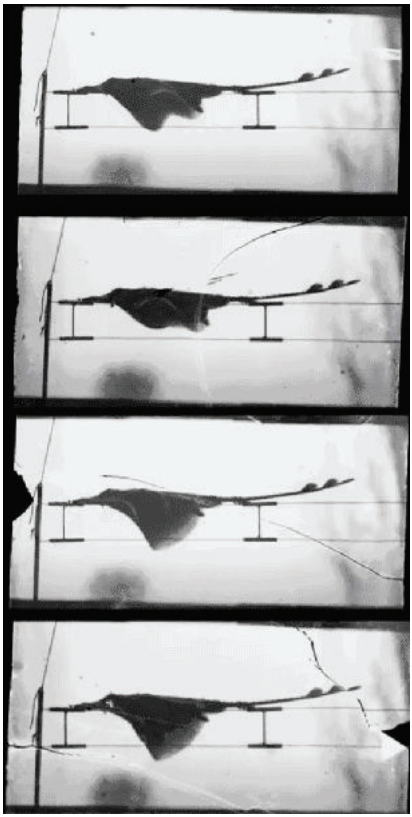
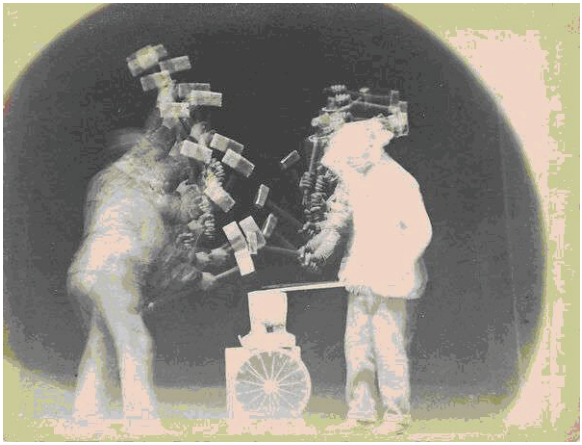
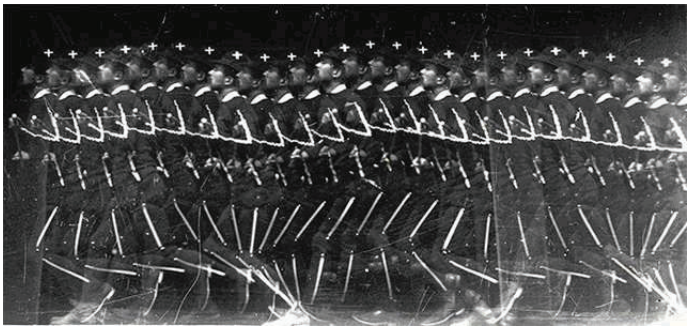


Fig. 156. — Disposition de l'aquarium marin pour l'étude de la locomotion dans l'eau.

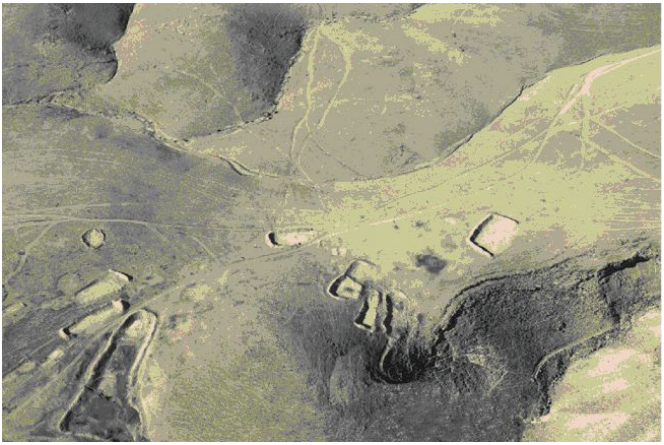


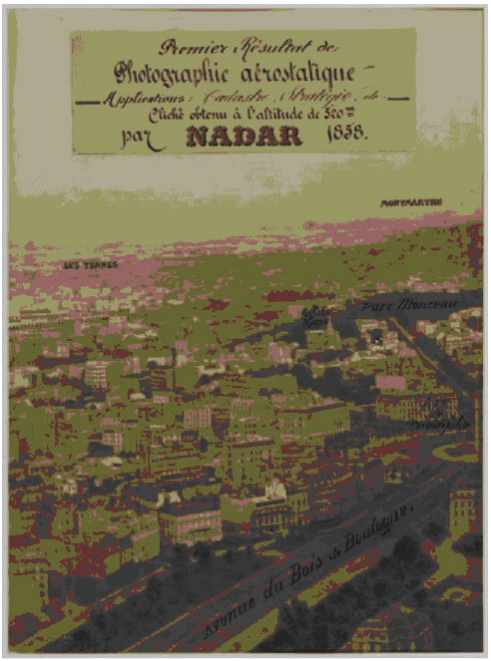


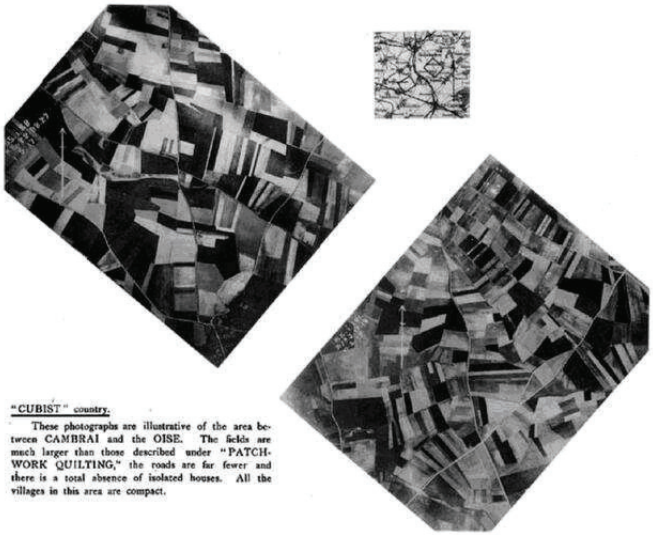






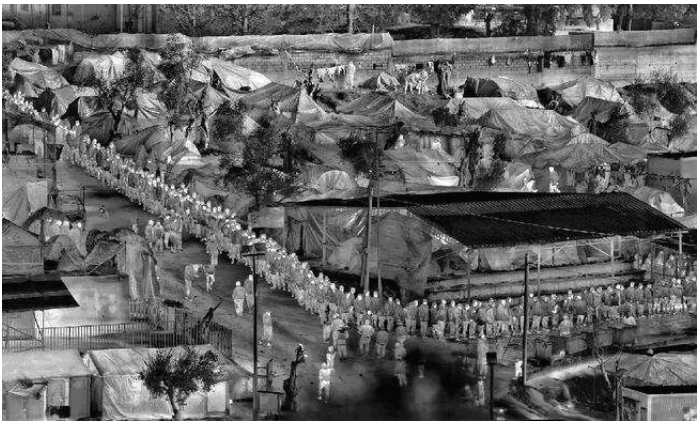






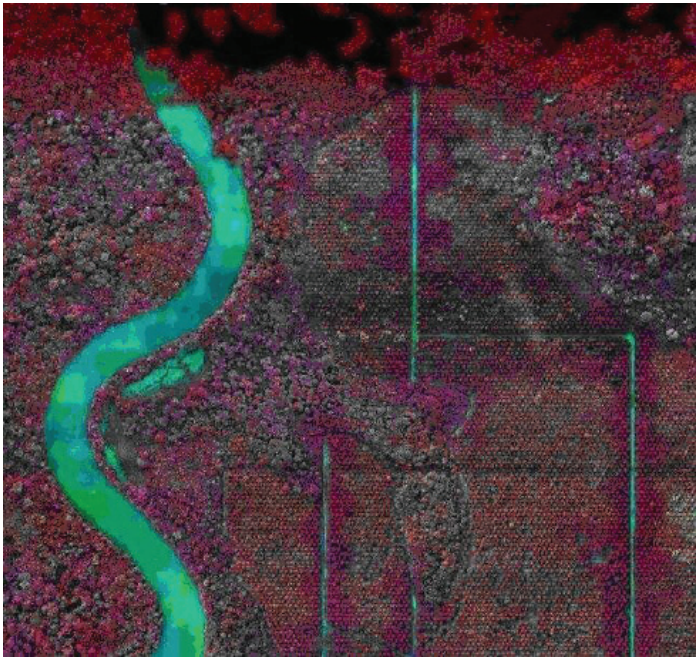
"CUBIST" country.

These photographs are illustrative of the area between CAMBRAI and the OISE. The fields are much larger than those described under "PATCH-WORK QUILTING," the roads are far fewer and there is a total absence of isolated houses. All the villages in this area are compact.

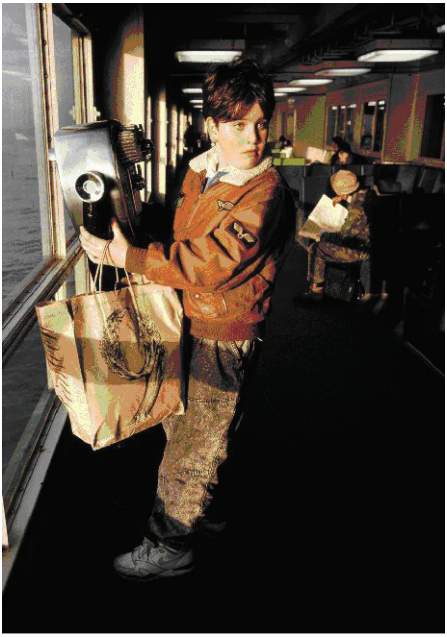






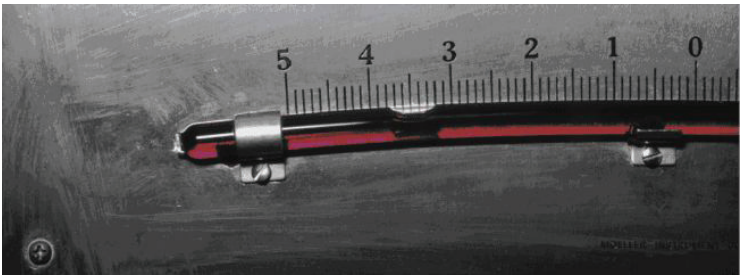








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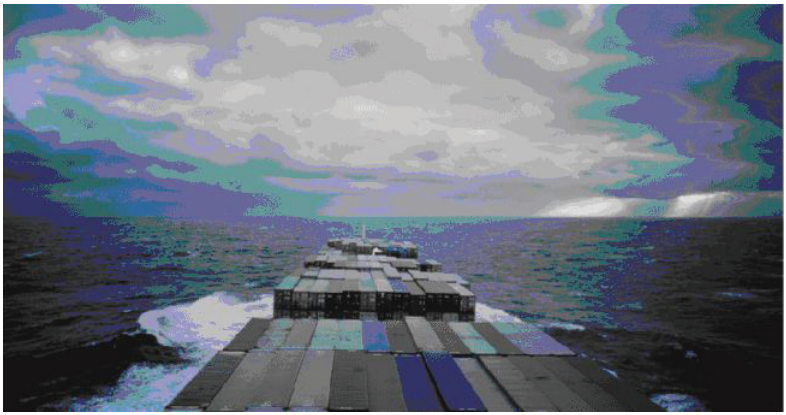

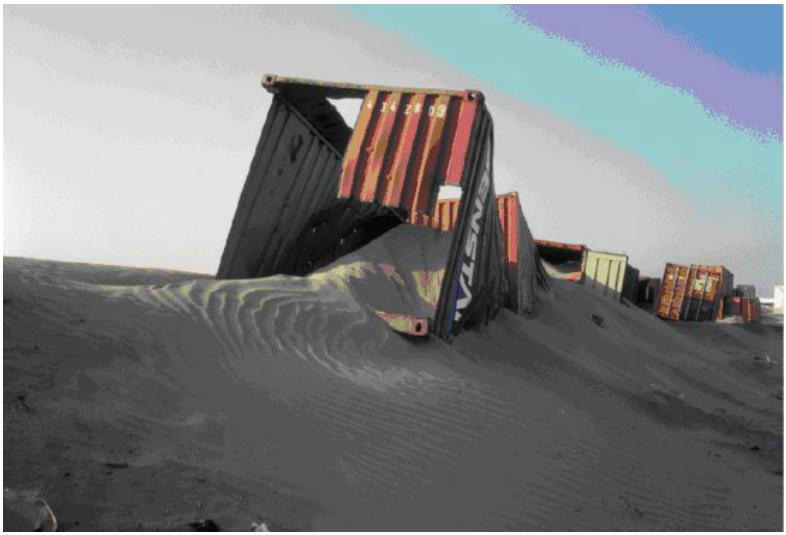

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Figure 10: Fazal Sheikh, Desert Bloom, No. 40, 2015.

Figure 11: Nadar (Gaspard-Félix Tournachon), Premier résultat de photographie aérostatique, ca. 1889.

Figure 12: Royal Air Force, Characteristics of the Ground and Landmarks in the Enemy Lines opposite the British Front from the Sea to St. Quentin, 1918.

Figure 13: Richard Mosse, "Moria in Snow, Lesbos, Greece", from The Castle, 2019.

Figure 14: Richard Mosse repurposing a military-grade thermal camera, 2016.

Figure 15: Richard Mosse, Broken Spectre, four-channel video installation, London, 2022.

Figure 16: Richard Mosse, Broken Spectre, 2022.

Figure 17: Allan Sekula, Fish Story, No. 1, 1995.

Figure 18: Allan Sekula, Fish Story, No. 2, 1995.

Figure 19: Allan Sekula, Fish Story, No. 49, 1995

Figure 1: Stazione Zoologica Naples, 1873.

Figure 20: Allan Sekula, Fish Story, No. 50, 1995

Figure 21: Allan Sekula, Fish Story, No. 27, 1995.

Figure 22: Allan Sekula, Fish Story, No. 28, 1995.

Figure 23: Allan Sekula, Fish Story, No. 78, 1995.

Figure 2: Advertisement for the Stazione Zoologica, 1902.

Figure 3: Étienne-Jules Marey in Naples with photographic gun, 1883.

Figure 4: Camera and aquarium for filming the movements of sea animals in Naples, 1890. In: Étienne-Jules Marey, Le Mouvement, 1894.

Figure 5: Étienne-Jules Marey, Raie Attachée, Mouvement des Nageoires, Naples, 1891.
Figure 6: Étienne-Jules Marey, Rowing a boat, Naples, 1890.
Figure 7: Étienne-Jules Marey, 1894.
Figure 8: Étienne-Jules Marey, "The Running Lion Tamer", 1886.
Figure 9: Fazal Sheikh, Desert Bloom, No. 4, 2015.

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The Eco-public Network
Defining New Territorial Values

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Abstract

This contribution explores the concept of the eco-public network (*Ecopublica*), a theoretical formulation that describes ecological and social networks in relation to their public character, understood as an indispensable condition for the construction of collective spaces, services, and infrastructures of shared well-being. Ecopublica conceives the territory as an active ecological infrastructure capable of supporting social, cultural, and environmental practices while simultaneously enhancing local heritage and the historical memory of places.

Starting from the case of Northeastern Italy, the discussion investigates how open spaces can structure a depolarised ecology capable of activating alliances between institutional and civic actors, oriented toward resilience and inclusion.

The idea of Ecopublica implies a productive paradox: on one hand, it embraces and extends decolonial perspectives by challenging the understanding of territory as a mere managed object or exploitable resource; on the other, it develops a theory of subjectivation that recognises territory as an autonomous entity. From this emerges the acknowledgement of ecological laws in dialogue with a new an-

thropic dimension governed by unprecedented norms, conventions, and rights. This dual subjectivity – both natural and social – opens a reflection on freedom and on the conditions of coexistence among life forms, value systems, and modes of governance.

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Keywords: Eco-social network, Subjectivation, Ecological justice, Coexistence, Alliances

1. *Introduction*

The paper explores the concept of the eco-public network (*Ecopublica*), a theoretical framework that describes the interweaving of ecological and social networks in relation to their public character. *Ecopublica* encompasses, on one hand, physical and spatial elements – urban and rural open spaces, porosities scattered within the built environment, slow mobility paths, collective infrastructures, and community spaces – and, on the other hand, a set of tendencies, expectations, and imaginaries produced by supra-local funding policies or by local care practices. Over time, these levels have contributed to defining ecological roles and values in relation to the uses and social practices that traverse them.

Ecopublica, understood as an operative threshold connecting conceptual understanding and empirical knowledge,[1] intersects different scales and assumes that ecology cannot exist without collective spaces where forms of common well-being can be built.

[1] Clementi, De Matteis & Palermo 1996.

This network becomes an original device for territorial interpretation and transformation, capable of dialoguing with both the plan and the project. While the plan refers to a preventive activity of territorial organisation, which elaborates long-term visions and priorities, the project translates these guidelines into a technical and symbolic device that produces spatial and social effects. Between these two dimensions, *Ecopublica* operates in the transition between planning and implementation, transforming strategic guidelines into actions. In this context, ecological infrastructure is both a structuring support and a strategic environmental resource for social and cultural practices, as well as a principle of historical recognition and local enhancement.

At the same time, *Ecopublica* represents a theoretical paradox that allows us to rethink certain decolonial theories from within through the territorial dimension. On the one hand, it recognises the subjectivity of the territory, considering it an autonomous entity, governed by ecological laws and different timescales (Durand, 1973); on the other hand, it highlights the inevitability of the anthropic perspective, governed by rules and conventions that define the subject and its forms of action.

This duality raises questions regarding the degree of freedom that governs their relationship and how to design the conditions for a truly autonomous ecological network. How, then, can architects and urban planners embrace indeterminacy as a means of regulating design, constructing spatial supports capable of adapting to a constantly changing environment?

The reflection focuses on north-eastern Italy and, in particular, on Friuli Venezia Giulia, a region where open spaces offer the opportunity to recognise a depolarised ecological framework capable of activating institutional and civic actors towards the definition of new alliances and new territorial values in terms of resilience, connection, and ecological justice.

On a broad scale, mapping EU programmes, and funds – often considered exclusively as expressions of top-down policies – reveals areas where projects are expressed through new and existing forms of collective action. At the local level, the concept becomes a tool for observing and building socio-ecological potential. It reveals an extensive, fine-grained network composed of seemingly residual elements – rows of trees, embankments, small woods, uncultivated areas – which, when connected, form both a material and symbolic ecological fabric.

The combination of the two scales reflects the pervasive nature of *Ecopublica*, which can be used to interpret values, actions, and perspectives within the framework of ecological transition and adaptation. By its very nature, the eco-public network is a system capable of absorbing transformations, adapting, regenerating, and responding to environmental and social stresses.

Ecopublica can thus be understood not only as an analytical category, but also as a design and policy-oriented proposal for interpreting the coexistence – and tensions – between nature and culture, ecological autonomy, and human governance in the construction of new territorial values.

2. *Which nature, and whose? Towards new territorial values*

The idea of nature that we have inherited from the past is that of a verdant, often unspoilt realm, subject to the laws of biology and ecological relationships. Traditionally, nature was understood as the opposite of the city: a space dominated by humans and their rules. This apparent irreconcilability, understood as the "great partition",[2] is one of the pillars of Western imagination, which over time has produced two complementary but opposing visions: on the one hand, predatory reductionism, which considers the non-human as a reserve of resources; on the other, nostalgic immobility that regrets a lost state of nature, irreparably corrupted by human action.[3]

During the twentieth century, our understanding of nature and the imagery associated with it underwent a further shift. Materialist theories[4] and historical materialism[5] contributed to framing nature as a site where the spirit of the times manifests itself: a complex space where ecological and social processes intertwine.[6] Nature, therefore, is no longer external or alternative to the city, but part of an interconnected system. As Coccia[7] points out, humans are, by definition, internal to nature, in a state of continuous intermingling. It follows that ecological and social processes should not be read separately, but rather as the result

[2] Stengers 1994.
[3] Metta 2022.
[4] Braun & Castree 1998; Smith 1996.
[5] Simmel 1903; Mumford 1961; Benjamin 1983.
[6] Escobar 1996; Taylor 2004.
[7] Coccia 2018.

of a deep connection that encompasses economic, political, and spatial dimensions.[8] From a historical perspective, natural spaces solidify the relationship between social concerns and planning schemes[9] while the exploitation of nature becomes part of the capitalistic system.[10]

Representations of landscape and nature powerfully reflect this vision over time. As Corboz[11] intuited, every map is a palimpsest that selects, orders, and omits. *Ecopublica* is part of this critical tradition, attempting to reveal what traditional maps have excluded from representation – the minor, marginal, or secondary parts. Their relationship is where the structural capacity of the territory lies: an uneven, sometimes abstract but "operational" potential, a "weak structure",[12] a network that recognises what already exists and amplifies its generative capacity, becoming a "device of emancipation".

Ecological infrastructure is not limited to large reserves but extends into a pervasive network of smaller elements: rows of trees, hedges, copses, ditches, uncultivated land, and patches of spontaneous vegetation. It is a living network, constantly being redefined, which structures the territory and accommodates social, cultural, and environmental practices. The eco-public network allows us to understand the relationship between natural space, which is symbolic and culturally connoted, and support space, which accommodates and sustains territorial practices.[13]

Their encounter produces complex configurations, where infrastructural logics intertwine with practices of appropriation, collective uses, and forms of hybridisation that continuously reshape the environment. In this sense, soft networks offer an alternative paradigm to the rigidity of hard networks: an adaptive force based on the recognition of the existing and on minimal project spaces balanced between intentionality and spontaneity.

Attributing a transformative role to this network implies recognising the territory itself as an autonomous entity, endowed with rights and agency. Not just a resource or a set of ecosystem services, but an entity that carries value. This reversal requires a rethinking of powers

[8] Bridge & Watson 2002.
[9] Barchetta 2017.
[10] Moore 2015; 2016.
[11] Corboz 1985.
[12] Viganò 2023.
[13] Viganò 2023.

and representations. Any attempt to attribute subjectivity to nature[14] still inevitably passes through the human subject, preserving the fundamental contradiction of "subjectivation"[15] granting rights to rivers, mountains, or ecosystems still means inscribing them in anthropocentric legal devices. It is in this context that surveying, mapping, and representation become political and cognitive acts of prime importance: tools for negotiating, rather than fixing, the degree of freedom between man and nature.

Political ecology is not limited to enlarging the decision-making arena,[16] but in rethinking the very forms of power and subjectivity. The ecological crisis reveals the inadequacy of traditional separations between human and non-human, public and private, technical and political. *Ecopublica*, in this sense, acts in the political re-composition of the territory: a network that redistributes agency and responsibility, shifting the focus from environmental governance to the ecological governance of relations between human and non-human subjects.

Corine Pelluchon[17] observes that what happens "between" subjects – human and non-human, endowed with different dignities and powers – matters more than the mere attribution of status. It is precisely in this relational space that the structural capacity of the territory is constructed: discontinuous, fragmentary, sometimes abstract, but always available.

The weak structure of the territory,[18] which includes actions and responsibilities distributed among different actors, thus becomes a laboratory for ecological transition, where natural, social, and functional spaces intertwine in constructing – also through redistributive forms – a less anthropocentric perspective.

3. *Minimal virtues and the value of the Little*

The idea of "weakness" as a creative force is linked to the thought of the Jesuit Giovan Battista Roberti. In his "Trattatello sulle virtù minime",[19] he explores the importance of small gestures and seemingly marginal qualities as the moral fabric of everyday life. Roberti

[14] Latour 1995.
[15] Foucault 1976; Agamben 1995; Revel 2014.
[16] Pellizzoni 2011.
[17] Pelluchon 2020, as cited in Viganò 2023.
[18] Viganò 2023.
[19] Roberti 1789, as cited in Ossola 2019.

values care, discretion, and attention to detail – those "minimal virtues" which, when added together, form the true substance of civil coexistence. Similarly, Adorno's *Minima Moralia* (1954) shows how the modern world is shaped by invisible presences that decisively influence the quality of existence. Ossola (2019) introduces the notion of "minimum time": what endures is what settles in the collective memory through repetition and duration. Applied to territorial projects, this means questioning the temporality of transformations and imagining slow, long-lasting processes aligned with environmental rhythms.

Bringing these themes into the field of architecture and urban planning, it emerges that every project is composed of minimal elements which, in their sum and relationship, generate spatial and social forms. However, the idea of minimal intervention has an autonomous and precise history: it did not arise as an aesthetic category, but as an ethical and operational position.

One key origin lies in the seminar held by Lucius Burckhardt and Bernard Lassus in Gibellina in 1981, organised in the context of the post-earthquake reconstruction of Belìce. There, Burckhardt formulated the famous principle of "doing (almost) nothing", conceiving it as a strategy of resistance to the excessive simplifications and abstractions of modernist planning. 'Minimal intervention' was thus conceived as an act of care and responsibility: a way of acting that recognised the autonomy of territorial processes and the value of the long timescales of natural regeneration.

Burckhardt's contribution[20] is part of a genealogy that diverges from the architectural and artistic minimalism of the same period: it is not about reducing form, but about reducing the impact of action, of leaving space for the life of the places themselves. Minimal landscape intervention sought sobriety, mindful of the ecological and social consequences of any transformation. Since then, the principle of minimal intervention has been an implicit reference in fragile or transitional contexts: the effectiveness of the project lies in the quality of the relationships activated, not in the quantity of material transformed.

At the ecological level, the territory reveals a web of spontaneous elements that host unexpected forms of biodiversity. These marginal fragments, when observed through the lens of *Ecopublica*, reveal their silent centrality in the construction of the landscape and in the defi-

[20] Ritter & Schmitz 2022.

nition of new forms of habitability. Applying minimal intervention to these materials means recognising their autonomous and reactive strength: they arrange themselves, interact and regenerate according to patterns that are only apparently random. These material and relational processes recall Gilbert Durand's[21] "dynamic symbolic structures", in which social and spatial forms move in hybrid configurations, continuously redefined by the interaction between elements.

Change, therefore, does not depend only on extraordinary actions, but also on small, widespread gestures. This is what Georges Perec[22] called the infra-ordinary: the hidden depth of the banal, the everyday, the seemingly irrelevant. When brought to light, the infra-ordinary reveals an unexpected density of meaning and connections, making visible the continuity between minimal acts and major collective changes.

This vision is rooted in principles that are not understood as renunciation, but rather as the ability to "do with little" and form alliances that respect the context. In this framework, *Ecopublica* renews the paradigm of minimal intervention as a generative opportunity. In an era marked by climate change and growing territorial inequalities, *Ecopublica* proposes evaluating the quality of a project not by the intensity of the intervention, but by its capacity to activate regenerative relationships between species, materials, subjects, and times. In this way, the infra-ordinary becomes a common ground for experimentation.

3.1. Ecopublica *and the recognition of new values*

In this perspective, *Ecopublica* functions as a heuristic device that highlights territorial values on the margins of traditional heritage categories. Following the notion of spatial capital,[23] attention shifts to what planning tends to overlook: residual spaces, local practices, informal economies, and proximity activities that do not generate immediate profit but build, over time, forms of shared value. The weak links in this network become indicators of an underlying vitality in the territory, capable of redefining the very metrics of value.

[21] Durand 1973.
[22] Perec 1989.
[23] Viganò 2023.

As a redistributive network, *Ecopublica* brings together two complementary principles: on the one hand, the sharing of resources and cooperation between diverse entities; on the other, the promotion of local alliances based on a frugal and sustainable concept of value.[24] In this dual tension, it mediates between tools and phenomena, showing how emerging processes escape traditional planning grids and, at the same time, how they can enable new metrics that are sensitive to relationships and long timeframes. The surveying and mapping of weak structures makes it possible to identify places and systems that are apparently marginal but have high generative potential. Prioritising the relational dimension, therefore, means shifting the centre of gravity of value beyond economic and ecosystem service measures alone.

From this perspective, empty, abandoned or neglected spaces are revealed as capable of hosting unexpected biodiversity and spontaneous care practices. These are places with a value that is still being constructed, to be recognised in their becoming as processes, not as definitive forms. Thus, *Ecopublica* transforms fragility into a principle of strength: what is weak, residual or invisible becomes the basis for a new ecology of value, founded on reciprocity, care and the ability of the territory to regenerate itself through distributed relationships.

4. *The eco-public dimension in the Friuli case study*

Ecopublica's generative capacity as a network of socio-ecological continuity is particularly evident in the north-eastern Adriatic, especially in the Friuli region, where scattered settlements and spatial marginality converge with economic and environmental fragility. This fragmented landscape of productive, agricultural, and residential areas reveals vulnerabilities, but also unexpected potential, capable of suggesting new paradigms of adaptation. In particular, along the coastal strip between Venice and Trieste, corresponding to the wetland area of the low plain with mechanical drainage and the lagoon, there is a progressive deterioration of urbanised environments, aggravated by the effects of climate change.

Paradoxically, this territory, which appears fragile but has high ecological value, may be better prepared than others to cope with the climate transition. This hypothesis raises a number of questions:

[24] PhM 2024.

could its large open spaces and residual areas, often regarded as empty, actually function as adaptive spaces capable of absorbing and redistributing environmental pressures?

In fact, mapping of green and blue networks in the coastal strip reveals a composite spatial capital: vast agricultural areas interwoven with a network of ditches, reed beds, vegetated embankments, lowland woods, and permanent grasslands. Although discontinuous, this network forms a genuine climate infrastructure capable of hosting biodiversity, regulating water flows, promoting slow mobility, and ensuring widespread accessibility to the landscape. As Fattorini[25] observes, urban ecology is not only about the presence of nature in urbanised spaces, but also about understanding the relationships between the biological, physical and social components that structure the territory. This perspective allows us to view eco-public networks as integrated ecological systems, in which widespread biodiversity and marginal elements take on an infrastructural and regulatory role. These are not isolated fragments, but active nodes that combine environmental and social functions.

A prime example is the case of the Muzzana and Carlino woods, remnants of the ancient lowland forest, which embody ecological, cultural and community values. Here, associations and civic groups have implemented forms of collective care that combine environmental regeneration and social involvement: the Fondazione Natura7, for example, has launched a reforestation project accompanied by educational activities aimed at strengthening the bond between inhabitants and the territory.

Similarly, the Passaggio a Nord-Ovest group in Marano Lagunare has reinterpreted the network of agricultural tracks as a cycling and walking route connecting woods, fishing valleys, and lagoons, transforming functional paths into devices for slow, shared interaction.

The eco-public network also manifests itself through almost invisible elements, such as permanent grasslands, valuable reserves of biodiversity in lowland areas, or wetlands along ditches and canals, populated by reeds and amphibious species. These micro-environments play a crucial role in mitigating extreme events, retaining water, and preventing flooding in nearby settlements. They are, to all intents and purposes, spontaneous climatic devices, where nature exercises its

[25] Fattorini 2019.

own agency without technological mediation. From this perspective, the Friulian landscape appears as an adaptive ecosystem, capable of reacting and regenerating itself through widespread interactions between natural and social elements. Where the territory appears fragile, there is instead a distributed ecological intelligence that can become the basis for adaptation and mitigation strategies based on cooperation and proximity.

The eco-public component in Friuli cases demonstrates how networks of spaces and relationships constitute available and operative resources for a concrete transition project. They support new alliances between communities and environments, generate shared values, and enable possible transformations.

5. *The project for new socio-natural alliances*

The climate crisis and the emerging urban question require us to rethink territorial planning as a process of socio-natural alliance, grounded in minimal intervention and increasing forms of local self-organisation. The spread of practices of care, self-management, and collective experimentation shows that responses to environmental change can no longer rely solely on centralised planning tools but must instead be grounded in widespread forms of cooperation rooted in places and communities.[26]

From this perspective, *Ecopublica* operates as an instrument of alliance, capable of connecting human and non-human subjects, institutions and civil society, natural resources, and social infrastructures. It is based on recognising the territory as a living and dynamic entity – a "garden in motion"[27] – in which indeterminacy becomes a resource rather than a limitation. The eco-public network does not represent the fixation of a condition but the shaping of a process. It grows and transforms through practices of care, negotiation, and appropriation, generating collective well-being within an open and constantly evolving relational system.

The roles and targets of the project are being reconsidered in terms of mediating and facilitating territorial ecologies that are evolving while simultaneously undergoing profound change. The project aims

[26] Magnaghi 2023.
[27] Clément 2011.

to create conditions conducive to self-organisation, interpret contemporary complexity, and restore spaces capable of accommodating the unexpected and adapting over time, thereby engaging with fields of uncertainty and possibility.

Designing eco-public networks thus becomes a matter of adopting new tools for reading and acting on the territory. The project does not aim solely at the analytical category but incorporates the evolving dimension of physical and social space, intervening in the living structures around which spontaneous and intentional transformations occur. It explores the possibility of an eco-public pact capable of restoring political depth, values, and new subjectivities to the territorial project.

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Philippineasian Resistance in Folk Literatures

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Abstract

This study examines Philippine folk literatures as a corpus that preserves anti-colonial resistance and Indigenous epistemologies despite the dominance of Western literary paradigms in the Philippines. While contemporary notions of *panitikan* remain tied to Spanish and American textual traditions, oral forms – epics, folktales, myths, riddles – retain aesthetic systems rooted in non-colonial experience. Using close readings of selected narratives collected by E. Arsenio Manuel, including racial-origin tales, trickster stories, and the Manuvu' *ulahingan*, the paper identifies three core findings. First, oral narratives repeatedly reverse colonial hierarchies, mocking the racial, economic, and political structures imposed by foreign rule. Second, these literatures affirm Indigenous agency by depicting everyday strategies of survival, adaptation, and resistance. Third, folk narratives articulate alternative sociomoral orders grounded in communal reciprocity, ecological harmony, and ancestral memory – what Manuel theorizes as the *Philippineasian* worldview. The paper concludes that folk literatures constitute an indispensable foundation for decolonizing national literary studies and for reconstructing a genuinely non-colonial notion of *panitikan*. Methods: textual analysis of oral narratives and ethnographic sources. Results: identification of resistance motifs and *Philippineasian* cosmologies. Implication: folk literature should be positioned as central, not peripheral, in defining Filipino (*Philippineasian*) literary identity.

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Keywords: Philippineasian, folk literatures, resistance, oral tradition, panitikan

1. *Coloniality and* Panitikan

Philippine literary discourse has long been shaped by Western epistemologies that entered the archipelago through Spanish and American colonization. Canonical Filipino works are regularly measured using European or American templates: *Florante at Laura* (1838) is interpreted through Spanish metrical romance; *Dead Stars* (1925) is celebrated as the "first modern short story in English" because it conforms to American stylistics; and even *Noli Me Tangere* (1887) and *El Filibusterismo* (1891) are habitually compared to Hugo or Dumas. These comparisons reveal a deep-seated assumption that literature derives legitimacy from Western forms.

Yet, as Bienvenido Lumbera[1] notes, pre-Hispanic Filipinos possessed their own poetics. His well-cited anecdote recounts a seventeenth-century Tagalog reader declaring a friar's Spanish-styled poem "magaling, datapuwa hindi tula" / "good, but not poetry," hinting at an indigenous aesthetic unconcerned with European conventions. This reaction aligns with the presence of highly developed oral traditions – *hudhud*, *darangën*, *sugidanon*, *ulahingan* – which functioned as repositories of communal memory, ethics, and cosmology before colonization.

E. Arsenio Manuel[2] argues that written Philippine literatures became "without tradition of its own" when oral forms were displaced by Westernized print culture. Christianization accelerated this shift by replacing pre-Hispanic (ethno)epics with religious narratives emphasizing salvation, sin, and obedience. In lowland Christianized regions, indigenous epics largely disappeared; in upland communities, however, orality remained the principal mode of transmission. The survival of Ifugao and Manuvu' epics thus reflects not cultural stasis but the maintenance of Indigenous autonomy from colonial power.

Manuel's concept of the *Philippineasian* situates Filipino identity within a larger Austronesian linguistic and cultural sphere rather than through Spanish or American genealogies. For him, folk literatures offer not merely stories but evidence of a non-colonial worldview grounded in ecological intimacy, communal reciprocity, and ances-

[1] Lumbera 2000.
[2] Arsenio Manuel 1980.

tor-centered cosmology. To recover *panitikan* beyond colonial frames, the first step is recognizing that oral literatures constitute the deepest stratum of Filipino literary consciousness.

2. *Philippineasian Resistance in Folk Narratives*

Resistance and subversion are recurring themes in Philippine oral narratives. Even seemingly humorous stories often invert racial hierarchies or mock colonial pretensions. A popular creation tale recounts how a god's first attempt at molding humans produced an undercooked pale man, the second a burnt dark man, and the third a perfectly cooked brown Filipino. Though playful, the tale symbolically reverses the colonial caste system that branded the natives as indio, negrito, or "little brown brothers." Through oral circulation, the narrative reframes colonial disparagement into communal affirmation.

Visayan "pataasan ng ihi" tales intensify this reversal. In one story, American, Negro (sic), and Japanese men attempt to make a queen cry through sexual prowess; all fail, but the Filipino – delayed after swimming an entire month to reach the queen – succeeds, his endurance symbolized by oysters clinging to his body. The hyperbole satirizes colonial masculinity while asserting Filipino bodily resilience. The oyster motif recalls Pigafetta's observations of non-colonial penile ornaments; Christianity later condemned such practices as obscene. Folk narratives thus preserve suppressed corporeal knowledge, resisting the moral discipline imposed by colonial regimes.[3]

Gendered resistance also appears in the transformation of the *babaylan* into *aswang*. As Herminia Menez[4] argues, the demonization of ritual priestesses functioned as a colonial strategy to dismantle women's spiritual authority. Yet their spectral persistence in folklore indicates an unextinguished cultural memory of non-colonial female power.

Trickster narratives express another form of subversion. In "Pusóng, the Stupid yet Successful Vendor," documented by Donn Hart,[5] the protagonist deceives Chinese merchants and local elites, forcing them to pay imagined debts. The story reflects indigenous anxieties about Chinese mercantile dominance while celebrating Filipino cleverness.

[3] Foucault 1978.
[4] Menez 1996.
[5] Hart 1974.

Hope Sabanpan-Yu[6] interprets the pusóng figure through the carnivalesque: he overturns hierarchies by ridiculing pretensions to power, thereby restoring social equilibrium.

Even Juan Tamad (Lazy Juan) – often invoked to stereotype Filipino "laziness" – can be read differently. Rather than affirming colonial accusations, his refusal to labor may be understood as a symbolic rejection of exploitative work structures introduced under Spanish friar-dominated economies and later under American capitalist expansion.

A more explicit confrontation with colonial power appears in the Manuvu' *ulahingan*. In Mam'pindaupan's narrative,[7] Agyu kills American teachers who strike Manuvu' children, rejecting foreign pedagogical discipline. When American troops retaliate, the epic depicts Manuvu' warriors confronting them, mocking the "iron" and "steel" of their weapons – clearly firearms – as instruments of cowardice. The epic inverts official U.S. narratives portraying Americans as benevolent educators by foregrounding Indigenous refusal and counter-violence.

At the heart of the *ulahingan* lies *Nalandangan*, a resplendent riverine utopia filled with abundant flora, fauna, and precious minerals. Richly described in song, *Nalandangan* functions as both mythic origin and aspirational future, a space of ecological harmony and communal well-being. Arlene Yandung[8] interprets it as a "more-than-human community" in which humans, spirits, and landscapes coexist as kin. This vision stands in stark contrast to the disruptions wrought by *reduccion*, land dispossession, and American resource extraction. The epic thus preserves an ecological and social ideal that resists colonial reorganization of space.

Manuel's study of Manuvu' property law further illuminates this worldview. Manuvu' notions of possession emphasize use, reciprocity, and non-exclusion: borrowing is expected; land is held through occupancy; and individual ownership is secondary to communal survival. These norms conflict with Western capitalist property regimes, which emphasize exclusivity and resource extraction. Folk narratives, by embedding these values in story, safeguard Indigenous legal-philosophical traditions against colonial erasure.

[6] Sabanpan-Yu 2014.
[7] Mam'pindaupan 1977.
[8] Yandung 2019.

3. *Toward a Non-Colonial Literature*

Three implications emerge from the foregoing discussion.

First, folk literatures consistently subvert colonial hierarchies. Whether through humor, satire, or epic confrontation, oral narratives articulate a Filipino identity that refuses to be diminished. They challenge racialized hierarchies, economic dependencies, and foreign disciplinary structures.

Second, these narratives demonstrate that Indigenous communities are active agents in shaping their histories. Rather than passive recipients of colonial influence, they interpret events – colonial education, economic intrusion, moral regulation – from their own vantage point. Performance becomes a means of preserving autonomy and transmitting communal ethics.

Third, folk narratives outline alternative world-orientations grounded in ecological reciprocity, communal responsibility, and spiritual kinship. These values contrast with the extractive, hierarchical structures introduced by colonial powers. *Nalandangan*, in particular, symbolizes a non-colonial horizon: a vision of socio-ecological harmony absent from colonial imaginaries.

If written *panitikan* remains deeply indebted to Western literary categories, oral folk literatures offer a path toward reconstructing a genuinely non-colonial Filipino literary tradition. Manuel's notion of the *Philippineasian* underscores this possibility by reframing Filipino identity as belonging to an Austronesian lineage shaped neither by Spain nor by the United States. Through continued documentation and critical study of oral traditions, scholars can help re-center Indigenous epistemologies in national literary discourse.

4. *Conclusion*

Philippine folk literatures reveal a long-standing tradition of resistance and cultural survivance. By reversing colonial hierarchies, challenging foreign authority, preserving gendered and ecological knowledge, and articulating Indigenous socio-moral orders, oral narratives constitute a counter-archive to colonial textuality. They offer insights into the *Philippineasian* worldview and provide a vital foundation for decolonizing *panitikan*. As Manuel suggests, the work of recording and analyzing these materials remains incomplete. Yet each

surviving narrative affirms literatures that has always resisted, always remembered, and always reimagined Filipino identity beyond colonial frames.

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Eco-Desire: Emptiness, Immanent Production, and the Ecology of Subjectivity

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Abstract

This article develops the concept of eco-desire as a synthesis of Buddhist non-attachment, Deleuzo-Guattarian productive desire and Kant's account of purposiveness without purpose. By examining desire as both an immanent creative force and an activity grounded in emptiness, the essay proposes a model in which the void functions not as a lack but as the condition of open-ended production. Guattari's ecosophy provides the framework for understanding desire as a component of mental ecology shaped by capitalist subjectivation, while Buddhism offers precise techniques for loosening the grip of the Self and transforming craving into non-possessive aspiration. Kantian teleology serves as the mediating structure that allows these traditions to converge: purposiveness arises not from nature itself but from human judgment, enabling desire to be reimagined as an immanent, self-generating process. Eco-desire thus names the relational, connective, and world-producing potential that emerges when emptiness and creativity are understood as mutually implicating. It designates a mode of existence capable of resisting capitalist capture and opening new forms of ecological subjectivity.

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Keywords: Eco-desire, mental ecology, productive desire, Buddhism, Deleuze and Guattari

1. *Introduction*

Investigating the problem of desire under capitalism inevitably leads to Anti-Oedipus by Gilles Deleuze and Félix Guattari. The theme of this inquiry, grounded in a broader Marxian and anthropocentric perspective, finds its necessary point of departure in Guattari's understanding of desire. While Deleuze's name has become more prominent in contemporary philosophy, it is Guattari who develops the concept of desire most concretely not as an abstract metaphysical principle but as a psycho-political and clinical reality. Guattari's political and psychoanalytic engagement sought to explore how the methodologies of psychoanalysis could be used in a Marxist key to liberate desire rather than repress it. For both thinkers, desire is the central object of capitalist logic: it is captured, coded, and directed toward consumption and self-production.

The key reference for this study is Guattari's The Three Ecologies, where he argues that the ecosophic problematic is not merely environmental but existential:

> In the final account, the ecosophic problematic is that of the production of human existence itself in new historical contexts.[1]

What is at stake, then, is not simply the preservation of nature but the reinvention of modes of living – affective, social, and psychic under the conditions of global capitalism. Guattari observes that both Marxism and the ecological movement have lost their transformative force; neither is able to counteract the capitalist production of subjectivity. To confront this impasse, he divides the ecological field into three interrelated dimensions environmental, social, and mental in order to provide foundations for new practices of existence capable of resisting homogenization. This article situates itself within the framework of mental ecology. It proposes the concept of eco-desire as a continuation of Guattari's project linking desire, subjectivity, and ecology in a single plane of immanence. Rather than attempting to cover all debates around desire, this essay focuses on how the Deleuzo-Guattarian conception of desire as a productive force can be rethought in the context of mental ecology, particularly through the lens of Buddhist thought. This movement is motivated by a fundamental tension: on the one hand, Deleuze and

[1] Guattari 2000, p. 34.

Guattari conceive desire as an infinite, intensifying flow; on the other, Buddhism envisions liberation through the cessation of craving. Between these poles, I introduce a mediating perspective Kant's teleology where purposiveness arises immanently, without recourse to any transcendent goal. Just as Kant shows that humanity cannot live without projecting purposiveness into the world, even when it is not objectively given, desire too may function in a similar way: as an immanent, self-generating activity that gives direction without assuming an external object or telos. The question this essay asks is whether desire, reimagined through ecosophic and Buddhist lenses, can become a creative and ethical force an eco-desire capable of resisting capitalist subjectivation and reconfiguring the relation between self and world.

2. *Desire in* Anti-Oedipus

"That the traditional logic of desire is all wrong from the outset…".[2] This claim sets the tone of Anti-Oedipus, where Deleuze and Guattari aim to wrench thought away from metaphysics and free the subject and desire from the logic of power. Their project redefines the subject as a process, destabilizes hierarchies, and reconceptualizes desire. Two critiques structure this intervention:

1. Desire is not based on lack.
2. Psychoanalysis wrongly confines desire to the Oedipal structure.

From here they build a model of productive desire, capable of generating new forms of life and undermining capitalism's mechanisms of subjectivation. The central axiom is simple: desire is not lack. "Desire does not lack anything; it does not lack its object… it is the subject that is missing in desire".[3]Desire is not a passive emptiness but a positive, active force. The concept of desire-as-lack is not universal; it is shaped by metaphysics and by capitalism, which needs subjects defined by need. Under this regime, desire becomes a void that must be endlessly filled, making the subject permanently inadequate and perpetually striving. This produces a "bad infinity": the subject is constituted as what it is not, always chasing a coherent "Self" offered by capitalist relations. Psychoanalysis reinforces this logic by reducing the entire field of desire to the family, turning the unconscious into an engine of conformity.

[2] Deleuze & Guattari 1983, p. 25.
[3] Deleuze & Guattari 1983, p. 26.

"Needs are derived from desire; they are counterproducts within the real that desire produces".[4] This inversion expresses the book's core political aim: to liberate desire from its capture by capitalist production and psychoanalysis. Desire is not organized by stable structures but by its capacity to form connections.

3. *Desire and Power: Toward a Micropolitics of the Unconscious*

"The schizophrenic is a person who… has been touched off by a desiring flow which threatens the social order".[5] Here the political stakes become visible. Power does not merely repress desire; it captures and channels it. Social production and desiring-production mirror one another. Capitalism depends on directing desire into forms that reproduce its own structures.

Schizoanalysis, seeks to decode desire, freeing it from Oedipal confinement and enabling non-hierarchical, creative connections. The task is to transfer power to desire itself: to let desire function as the primary productive force of new subjectivities and new social forms. The schizophrenic flow becomes a metaphor not for illness but for the liberated, world-generating capacity of desire. Guattari opens The Three Ecologies with a fundamental claim: ecological crises cannot be understood apart from crises of subjectivity. The devastation of ecosystems, the erosion of social bonds, and the saturation of mental life by capitalist signs belong to a single process. As he writes, "Ecology in my sense questions the whole of subjectivity and capitalistic power formations".[6] Ecological, social, and psychic degradation arise from one and the same machinic infrastructure: the capitalist production of subjectivity.

4. *The Failure of Marxism and Environmentalism*

Guattari observes that both Marxism and the ecological movement have lost their transformative force. Marxism becomes reduced to institutional critique without a micropolitical dimension; ecology is absorbed into technocratic management. Instead of challenging the

[4] Deleuze & Guattari 1983, p. 27.
[5] Semiotext(e) Collective 1974, p. 152.
[6] *Ivi*, p. 52.

organization of desire and the production of subjectivity, both movements risk becoming instruments of neutralization. Guattari does not propose a program or a unified theoretical synthesis. Instead, he demonstrates how these movements may be reactivated once they address the processes by which subjectivity itself is shaped, captured, or liberated. Guattari's central claim is that ecological thought must be expanded to include three registers: environmental ecology, social ecology, and mental ecology. These are not separate domains but interdependent "components of subjectification," each operating according to its own semiotic regime:

> Rather than speak of the 'subject', we should perhaps speak of components of subjectification, each working more or less on its own.[7]

Mental ecology concerns the production of modes of sensibility, perception, desire, and affect. Social ecology addresses forms of social organization, institutional arrangements, and collective practices. Environmental ecology covers the material world, non-human life, and the physical environments in which subjectivities emerge. Guattari's ecosophy is an attempt to create transversal connections among these three domains.

Central to Guattari's critique is the idea that capitalism no longer merely organizes production and distribution; it produces subjectivity. It penetrates the most intimate strata of mental life, dictating what individuals consider normal, acceptable, desirable, or even thinkable. This is not simply alienation in the classical Marxist sense the separation of worker from product but a deeper reconfiguration of the very conditions of existence. Capitalism forms subjects who perceive themselves as autonomous while being governed by semiotic regimes that shape desire at its roots. It manufactures the coordinates of possibility: what can be desired, what can count as a meaningful life, what futures seem attainable. Subjectivity becomes formatted to meet the needs of capitalist social machines.

Within this framework, mental ecology becomes the most crucial dimension for rethinking desire. It is here that Guattari's work intersects with the Deleuzo-Guattarian critique of desire-as-lack. If desire is primarily productive forming connections, generating assemblages,

[7] Guattari 2000, p. 36.

creating new modes of existence then capitalist subjectivity is the process that channels, formats, and normalizes this productivity. Guattari's contribution is to show that any transformation of ecological or social relations must begin with the reconfiguration of desire and the semiotics that govern it. Instead of repressing desire, ecosophy seeks to liberate it from capitalist coordinates, enabling what Guattari elsewhere calls "processual subjectivation" the ongoing creation of new modes of living. The task is not to restore a natural or authentic subject but to multiply the possible forms of subjectivity that can emerge. This becomes particularly significant for a Marxism situated in the Anthropocene: it can no longer rely solely on economic critique but must engage the micropolitical production of desire. In the context of the Anthropocene, Guattari provides a conceptual framework that unites ecological, social, and mental transformations. His ecosophy reveals why materialist critique must address not only the relations of production but the production of subjectivity. While Deleuze and Guattari treat desire as a productive, subversive force capable of undoing rigid structures, they also seek to appropriate the analytic posture of psychoanalysis without accepting its reduction of desire to the Oedipal triangle. This chapter proposes an alternative route for the emancipation of desire less through schizoanalysis and more through Buddhism, which offers a long-tested and precise methodology for working with desire.

The central claim of this chapter is that both Buddhism and Deleuze–Guattari root the problem of desire in the constitution of the Self. Both perspectives reveal a potential alternative to the fetishistic forms of desire cultivated by capitalism. What they share, at their base, is a gesture of erasing or dissolving the Self as an anchoring point. The parallels emerge most clearly in two domains: the philosophy of desire and the philosophy of the Self.

5. *The Buddhist Philosophy of Desire and the Self*

Buddhist cosmology already frames desire as a layered phenomenon. The "realm of sense-desire" (kāma-dhātu) encompasses beings who perceive objects primarily by their desirability or undesirability. As one source states:

> The lowest of these is the 'realm of sense-desire' (kāma-dhātu)… In all of these realms, beings perceive sensory objects in such a way as to particularly notice their qualities of desirability or undesirability.[8]

This framing already indicates that desire is not neutral but structured by perception and attachment. Buddhism distinguishes craving (tanhā) from wholesome aspiration (chanda). Craving is understood as the fundamental cause of suffering (dukkha):

> So the key origin or cause of dukkha is tanhā. This literally means 'thirst', and clearly refers to demanding, clinging desires which are ever on the lookout for gratification, 'now here, now there'. It contains an element of psychological compulsion, a driven restlessness ever on the lookout for new objects: I want, I want more, I want different.[9]

Here craving appears as the exact opposite of Deleuzian desire: not productive but repetitive and binding, not open-ended but self-reinforcing. At the same time, Buddhism does not eradicate all forms of wanting. Through mindfulness practice, practitioners learn to observe desires without being dominated by them. This reflective distance enables the transformation of craving into intentional, creative energy. Such transformation also carries ecological implications: by recognizing impermanence and interdependence, individuals are encouraged to engage the world through respect and care rather than extraction or accumulation. As the text emphasizes, impermanence is a universal condition: "Buddhism emphasizes that change and impermanence are fundamental features of everything, bar Nirvāṇa."[10] Thus Buddhist desire is not annihilation but reorientation.

The doctrine of non-Self (anattā) directly targets the metaphysical assumptions that sustain craving. In contrast to the Upaniṣadic tradition, which seeks a real Self identical with Brahman, the Buddhist suttas deny the existence of any metaphysical Self altogether:

> In the Buddhist Suttas, though, literally everything is seen as non-Self, even Nirvāṇa. When this is known, then liberation… is attained by total non-attachment.[11]

[8] Murti 1955, p. 34.
[9] *Ivi*, p. 63.
[10] *Ivi*, p. 57.
[11] *Ivi*, p. 59.

The Buddha accepted everyday uses of "self," but only as convenient shorthand for a composite of processes. There is no hidden entity behind the aggregates; there is only a functional assemblage. Continuity of character is explained similarly as persistent character traits are merely due to the repeated occurrence of certain cittas… while such traits may be long-lasting, they are impermanent, and so 'non-Self', insubstantial. Another major cause of suffering is fixation on views (diṭṭhi): This dimension is crucial for comparison with Deleuze and Guattari, since their project also aims to destabilize fixed perspectives and rigid identifications. The Buddhist orientation is not toward skepticism in the Greek sense but toward the dissolution of the identificatory impulse itself. The goal is freedom from the compulsion to place oneself within a determinate position.

6. *Convergences with Deleuze and Guattari*

The refusal to anchor oneself within a fixed identity or viewpoint is where Buddhism and Deleuze-Guattari resonate most. Both offer practices – conceptual or meditative – for loosening the structures that bind the subject to itself. Deleuze and Guattari do not propose a doctrinal system; they propose techniques of deterritorialization. Buddhism likewise offers methods for eroding the grip of the Self. Yet their aims diverge. Buddhism seeks to reveal the illusory nature of phenomena and to bring suffering to an end. Deleuze and Guattari seek to cut through the capitalist encodings of desire and reveal possibilities of life beyond them. Buddhism dissolves the Self to end suffering; Deleuze and Guattari dismantle the Self to make new forms of life possible. Nevertheless, the two share a foundational operation: the destabilization of the Self as the precondition for transforming desire. This shared gesture not the identity of doctrines is what makes their comparison conceptually meaningful.

7. *Kant's Teleology as a Mediating Framework Between Buddhist Non-Desire and Deleuzo-Guattarian Productive Desire*

Kant's Critique of the Power of Judgment provides the conceptual hinge between the Buddhist suspension of desire and the Deleuzo-Guattarian affirmation of desire as an infinite, productive force. The central task here is to demonstrate that a transition between these

seemingly incompatible positions is not only possible but structurally grounded in Kant's account of teleology.

At the heart of Kant's teleological judgment lies a crucial distinction: nature does not possess intrinsic purposiveness; rather, purposiveness is a regulative projection of the human faculty of judgment. Nature, as such, has no goals, intentions, or final causes. This absence of inherent purpose resonates with the Buddhist insight into emptiness (śūnyatā) the idea that phenomena lack intrinsic essence or teleological grounding. Both systems, in their own ways, deny that nature is organized around stable goals or substantial ends. Yet Kant simultaneously insists that humans must judge nature as if it were purposive in order to make sense of its forms and developments. This "as if" structure opens a space of meaning without positing metaphysical teleology. In doing so, Kant provides a conceptual model for how desire can arise from non-desire: while nature itself lacks ends, human cognition and by extension, human desire introduces an open plurality of possible ends. The mind becomes the site where purposiveness is generated, not discovered. This is precisely where Deleuze and Guattari enter. Their notion of desire as an immanent, productive force depends on the refusal of transcendent ends and fixed purposes. Desire produces its own aims through the connections it forms; it is teleological only in the immanent, self-generating sense. Kant's account of purposiveness without purpose anticipates this structure: desire can be infinite not because nature is teleologically determined, but because it is not. The absence of intrinsic purpose in nature becomes the very condition for the multiplication of purposes within desire. Kant therefore provides the missing philosophical bridge. Buddhism reveals the emptiness of ends; Deleuze and Guattari reveal the creative generation of ends. Kant's teleology shows how these two can coexist: emptiness does not negate desire but allows it to become radically open, non-fixated, and infinitely generative. The problem of reconciling these two divergent theories is dissolved once purposiveness is understood not as an inherent structure of nature but as a dynamic interpretative and productive capacity of human beings.

Nature becomes the central mediating term. For Kant, it is the space where purposelessness and purposiveness meet; for Buddhism, it is the field of empty arising; for Deleuze and Guattari, it is the immanent plane of desire's creative operations. It is nature that loosens

the grip of capitalist organisation on the subject, while simultaneously revealing the full potential of desire not as consumption or identity-preservation, but as the continuous production of new relations, forms, and meanings. Through Kant's teleology, the transition from the Buddhist suspension of desire to the Deleuzo-Guattarian intensification of desire becomes not a theoretical leap but a continuous conceptual movement.

8. *Eco-Desire: Toward a Synthesis of Immanent Creativity and Emptiness*

Having outlined the theoretical positions necessary for this inquiry, I can now articulate the conceptual core of eco-desire. In my view, eco-desire emerges at the intersection of two seemingly incompatible dimensions: the infinite productive potential of desire and the emptiness at its foundation. The claim that something grounded in a structural void an originary dispersal could generate an inexhaustible flow may appear contradictory at first. Yet it is precisely the passage through the impersonal, the non-conceptual, and the post-ideological that opens a space of unending creativity. The absence of a fixed ground is not a deficit but a precondition for proliferation. Buddhism presents a useful contrast. Conceptually and practically, it is not oriented toward building a large-scale collective order. Its mode of operation is to "fish out" the individual, offering a path of personal liberation. But it is difficult to imagine a functioning social totality founded solely on Buddhist principles; if one were to apply Kant's categorical imperative to Buddhism, the universalization of its practical ethos would collapse its conditions of possibility. Buddhism can liberate a person, but not humanity all at once.

Deleuze and Guattari, by contrast, explicitly orient their project toward collective transformation. Their work aims to dismantle the social and political order of capitalist desire by freeing desire itself first in its singular expressions, but always with an eye toward the liberation of the socius. This orientation becomes most visible in their notion of nomadic ethics, a mode of life that resists capture, refuses rigid identity, and continually reopens the possible. Eco-desire names the desire of everything that comes from nowhere. It is not the desire to consume, nor the desire to protect or preserve an identity. It is nature's own desire: the impulse to remain in a state of variation, to

generate connections, to open itself to the new. Whenever the limits of the possible appear, eco-desire traverses them, multiplies relations, and expands immanent connectivity. It does not stabilize being; it intensifies its relationality.

Within this framework, Buddhism functions as a mediator between the human and the natural. If Deleuze and Guattari critique capitalism for the way it organizes both desire and nature transforming the latter into a resource and the former into a lack Buddhism provides a path of return to one's origin, understood in Simondon's sense as the pre-individual. This pre-individual field is neither personal nor transcendental; it is a metastable reservoir of potentials, a groundless ground from which individuation unfolds. Eco-desire thus names the conjunction of these trajectories: the Buddhist insight into emptiness as the condition of arising, and the Deleuzo-Guattarian affirmation of desire as productive, connective, and world-making. It is the desire of nature to exceed itself through relations; the desire of subjectivity to dissolve into a field of immanent becoming; the desire of the social to reinvent its forms beyond capitalist capture.

In this sense, eco-desire is not a metaphor but a mode of existence. It marks the point where emptiness becomes productive, where the void becomes relational, and where desire becomes ecological not because it turns toward "the environment," but because it recognizes that every entity, human or not, participates in a shared field of immanent co-emergence.

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