

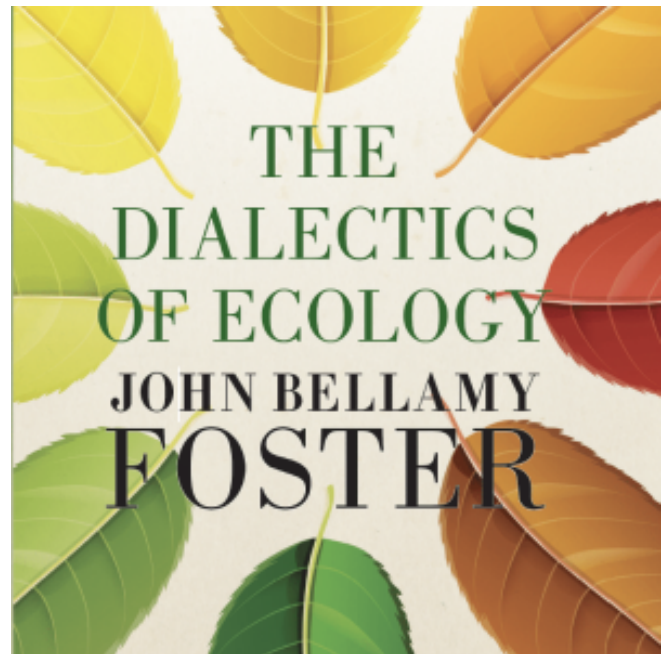
The Dialectics of Ecology: An Introduction

All nature is in a perpetual state of flux.... There is nothing clearly defined in nature.... Everything is bound up with everything else.

—Denis Diderot¹

John Bellamy Foster

As Harvard ecologist and Marxian theorist Richard Levins observed, “perhaps the first investigation of a complex object as a system was the masterwork of Karl Marx, *Das Kapital*,” which explored both the economic and ecological bases of capitalism as a social-metabolic system.² The premise of the dialectics of ecology, as it is addressed in this article, is that it is above all in classical historical materialism/dialectical naturalism that we find the method and analysis that allows us to connect “the history of labor and capitalism” to that of the “Earth and the planet,” enabling us to investigate from a materialist standpoint the Anthropocene crisis of our times.³ In Marx’s words, humanity is both “a part of nature” and itself “a force of nature.”⁴ There was, in his conception, no rigid division between natural history and social history. Rather, “The history of nature and the history of men [humanity]” were seen as “dependent on each other as long as men exist.”⁵



This is the introduction to John Bellamy Foster, *The Dialectics of Ecology: Society and Nature* (New York: Monthly Review Press, 2024).

¹ ↪ Denis Diderot, *Rameau’s Nephew and D’Alembert’s Dream* (London: Penguin, 1966), 181.

² ↪ Richard Lewontin and Richard Levins, *Biology Under the Influence* (New York: Monthly Review Press, 2007), 185–86, at 110.

³ ↪ Dipesh Chakrabarty, *The Climate of History in a Planetary Age* (Chicago: University of Chicago Press, 2021), 173, 205.

⁴ ↪ Karl Marx, *Capital*, vol. 1 (London: Penguin, 1976), 283; Karl Marx, *Critique of the Gotha Programme* (New York: International Publishers, 1938), 2; Karl Marx, *Early Writings* (London: Penguin, 1974), 328.

⁵ ↪ Karl Marx and Frederick Engels, *Collected Works*, vol. 5 (New York: International Publishers, 1975), 28.

In this view, the relation of labor and capitalism to the earth's metabolism is at the center of the critique of the existing

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order. “Labour,” Marx wrote, “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.”⁶ However, with the advent of “capitalist production,” a systematic disturbance and displacement occurs in “the metabolic interaction

between man and the earth,” creating a metabolic rift, or ecological crisis, severing essential natural relations and not only “robbing the worker but...robbing the soil.”⁷

Today, this ecological rift in the metabolism of society and nature can be seen as having reached an Earth System level, creating what scientists have called an “anthropogenic rift” in the biogeochemical cycles of the entire planet, resulting in what Frederick Engels referred to metaphorically as the “revenge” of nature.⁸ In the classical historical-materialist perspective, this contradiction can only be resolved by reconciling humanity and nature. Such a reconciliation requires overcoming not simply the alienation of nature, but the self-alienation of humanity itself, manifested most fully in today's destructive, commodified society. What is necessary in such an analysis is recognition from the start of the “corporeal” nature of human existence itself, which is tied to production. Hence, if a “new universal history of the human” is necessary in our time, it is here, within the historical-materialist tradition, that the necessary materialist, dialectical, and ecological method is to be found. For Marx, “Universally developed individuals, whose social relations, as their own communal relations, are hence also subordinated to their own communal control, are no product of nature, but of history.”⁹ However, human history is never detached from “the universal metabolism of nature,” of which the social metabolism based in the labor and production process is an emergent part.¹⁰

In such a dialectical-ecological perspective, there are no fixed answers applicable to all of history, since everything around us in natural history and social history—constituting, as Marx said, the “two sides” of a single material reality—can be seen as in a state of constant flux.¹¹ Nevertheless, it will be argued here that the method of dialectical ecology, rooted in historical materialism and aimed at transcending the alienation of humanity and nature, provides a basis for uniting theory and practice in new, revolutionary ways. This constitutes the necessary dialectical negation or overcoming of the material conditions of our current alienated, divided, and dangerous world, itself the product of human historical development. Such a view assumes that there is a contingent, ever-changing historical process in which each new emergent reality bears within it an incompleteness and various contradictory relations, leading to further transformative developments. As Corrina Lotz indicates, dialectical negation properly embraces “absenting (Roy Bhaskar's term), removal, loss, conflict, interruption, leaps and breaks,” often understood in terms of the general concept of emergence, or the qualitative shift to higher organisational levels, which, as Engels said, always carries within it the potential for

⁶ ↪ Marx, Capital, 1, 283.

⁷ ↪ Marx, Capital, vol. 1, 637.

⁸ ↪ Clive Hamilton and Jacques Grinevald, “Was the Anthropocene Anticipated?” Anthropocene Review 2, no. 1 (2015): 6–7; Marx and Engels, Collected Works, 25, 461.

⁹ ↪ Karl Marx, Grundrisse (London: Penguin, 1973), 162; Marx, Early Writings, 389–90.

¹⁰ ↪ Marx and Engels, Collected Works, 30, 62–63.

¹¹ ↪ Marx and Engels, Collected Works, 5, 28.

annihilation.¹² The structure of history, including natural history, thus always contains within it crises and catastrophes, along with the possibility of something qualitatively new, drawn from a combination of residuals of the past (previously negated realities) interacting in contingent ways with the present as history and generating transformative change. History, whether natural or human history, is thus not linear, but rather manifests itself as a spiral form of development.

The notion of human historical development, a relatively recent conception that scarcely precedes the capitalist era, is a

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product of the changing relation of human beings to nature as a whole. As Marx recognised, Epicurus in Hellenistic antiquity saw the origins of natural philosophy or natural science as tied to an overriding sense of danger that the natural world represented in the daily lives of human beings.¹³ In Epicurean philosophy, there was no rational answer to be found to this existential condition, other than reconciliation with the world through forms of

contemplative self-consciousness and the development of a sense of oneness with nature, or ataraxia, by means of enlightenment/science.

The enormous historical development of the productive forces, separating antiquity from the modern world, and the emergence of modern science in this context was to alter fundamentally the relation between humanity and its natural environment. Bourgeois society, as a result of this “progress” and the scientific revolution of the seventeenth century, would revel in the “domination of nature” provided by Enlightenment science. The realm of natural necessity was seen in this conception as being forever pushed back and even transcended.¹⁴ This, however, gave rise to the conceit, as Engels noted, of “human victories over nature” in the manner of “a conqueror over a foreign people,” a view that, because of its lack of foresight and its narrow objectives, led to human-generated ecological catastrophes.¹⁵

As a result of the historical process, humanity finds itself once again confronted with an overarching sense of danger emanating from the forces of nature. Yet, behind this existential threat to humanity and life lies human labor, itself a force of nature, now generating planetary-level catastrophe. The alienation of nature under capitalism is such that money is fetishistically mistaken for existence, while private extraction and expropriation, the robbery of the earth, is confused with real wealth. In the historical-materialist view, the contradiction between humanity and the earth can be transcended before it proves fatal, but only if the two sides of human self-alienation—alienation from humanity and alienation from nature—are transcended through the “revolutionary reconstitution of society as a whole” and the creation of a world of substantive equality and ecological sustainability.¹⁶

The development of such an approach based on classical historical-materialist grounds cannot consist simply of a theoretical reconstruction of the analysis of Marx and Engels in this area, involving a synthesis of their contributions to an ecological-materialist dialectics. At best, the only thing such an approach can generate is a more critical method in analyzing the present, although it is the actual overcoming of the present as history that is the overriding concern. Above

¹² ↪ Corrina Lotz, “Review of John Bellamy Foster’s *The Return of Nature*,” *Marx and Philosophy*, December 16, 2020; Marx and Engels, *Collected Works*, 25, 123; Evald Ilyenkov, *Intelligent Materialism* (Chicago: Haymarket, 2018), 27; Immanuel Kant, *Critique of Pure Reason* (Cambridge: Cambridge University Press, 1997), 304.

¹³ ↪ Marx and Engels, *Collected Works*, 1, 30, 102, 407–9; Benjamin Farrington, *The Faith of Epicurus* (London: Weidenfeld and Nicolson, 1967).

¹⁴ ↪ William Leiss, *The Domination of Nature* (Boston: Beacon, 1974).

¹⁵ ↪ Marx and Engels, *Collected Works*, 25, 460–61.

¹⁶ ↪ Karl Marx and Frederick Engels, *The Communist Manifesto* (New York: Monthly Review Press, 1964), 2.

all, it is necessary to address the rapidly developing ecological crisis of the Anthropocene Epoch in human history, which marks the rise of anthropogenic, as opposed to nonanthropogenic, factors as the main driving force of Earth System change. Here we must confront the current financialization of nature, the new phase of planetary extractivism, questions of human survivability, and the revolutionary struggle to create a society of planned degrowth and ecological civilization geared to sustainable human development. All of this, however, depends on the recovery, development, and unification in theory and praxis of the dialectical-ecological critique of capitalism, which is an indispensable and indisputable legacy of classical historical materialism.

The Dual Negation of Dialectical Materialism

Soviet Marxism and the Dialectics of Nature

The reconstruction of Marxian ecology based on classical historical materialism is a very recent and still very incomplete development, largely confined to the present century and to the rise of ecosocialism. Both official Marxism associated with the Soviet Union of the late 1930s and after, which removed the critical element within philosophy together with Marx's ecological analysis, and the Western Marxist philosophical tradition, which rejected dialectical naturalism altogether, presented enormous obstacles to the further development of the historical-materialist ecological critique. This, then, constituted a dual negation of the dialectics of nature emanating from the Cold War antagonism between East and West. But it is one that has been increasingly transcended in recent decades as material conditions have changed.

Soviet philosophy, as originally conceived under the leadership of V. I. Lenin, Leon Trotsky, and Nikolai Bukharin on the occasion of the launching of its original flagship publication, *Under the Banner of Marxism*, in 1922, was intended to bring together the materialist perspectives of both Mensheviks and Bolsheviks (representing, respectively, the relatively reformist and revolutionary tendencies within Russian Marxism), mechanists and dialecticians, and philosophers and natural scientists, with the object of the concretisation of a wider and internally differentiated philosophy of dialectical materialism. This was a term introduced by the working-class philosopher Joseph Dietzgen and owed its influence mainly to the work of the founding Russian Marxist (and Menshevik) Georgi Plekhanov.¹⁷

Lenin set the tone in his 1922 letter to *Under the Banner of Marxism*, which was published as an article titled "On the Significance of Militant Materialism." Here, he insisted that it was necessary to bring "materialists of the non-communist camp" together with revolutionary materialists in order to promote a mutually engaged philosophical discussion. The object was to develop a fundamentally Marxist "militant materialist" view and at the same time guard against rigid dogmas. "One of the biggest and most dangerous mistakes made by Communists (as generally by revolutionaries who have successfully accomplished the beginning of a great revolution) is the idea that a revolution can be made by revolutionaries alone." Rather than excluding leading Menshevik philosophers such as the talented Liubov Isaakovna Akselrod (a former assistant to Plekhanov) and Abram M. Deborin from the new journal, Lenin insisted on the necessity of their inclusion. To protect against mechanistic materialism or mechanism (today more often called reductionism), he declared as essential the critical incorporation of Hegelian dialectics, despite its idealist basis, within the purview of the journal. Thus, *Under the Banner of Marxism* should, in his words, "be a kind of 'Society of Materialist Friends of Hegelian Dialectics.'"¹⁸

¹⁷ ↪ Joseph Dietzgen, "Excursions of a Socialist in the Domain of Philosophy," in *Philosophical Essays* (1887; repr., Chicago: Charles H. Kerr, 1912), 293; Georgi Plekhanov, *Selected Philosophical Works*, 1 (Moscow: Progress Publishers, 1974), 421.

¹⁸ ↪ I. Lenin, "On the Significance of Militant Materialism," in Yehoshua Yakhot, *The Suppression of Philosophy in the USSR* (Oak Park, Michigan: Mehring, 2012), 233–40.

Soviet philosophy was from the start aimed at developing dialectical materialism as a general theoretical view applicable to both philosophy and science, based proximately on the work of Engels, Plekhanov, and Lenin, but rooted more fundamentally in the work of Marx, G. W. F. Hegel, and Baruch Spinoza. (Marx's philosophical discussions in his early Economic and Philosophical Manuscripts were at that time unknown.)

Engels's *Anti-Dühring* and the incomplete *Dialectics of Nature* provided a guiding thread that, in its most succinct expression, revolved around the three ontological principles or "laws," derived from Hegel, of the (1) transformation of quantity into quality, and vice versa; (2) the identity or unity of opposites; and (3) the negation of the negation.¹⁹ The first of these was meant to capture what are often called in today's scientific language phase changes or threshold effects, in which quantitative changes lead to new qualitative realities. Through such qualitative transformations, which can be observed both in nonhuman nature and in society, a "new power," Marx and Engels observed, emerges that is "entirely different from the sum of its separate forces."²⁰ The second ontological principle addresses the contradictions that arise due to incompatible developments within the same relation intrinsic to all processes of motion, activity, and change. The third ontological principle of the negation of the negation refers to how the processes associated with the first two principles set the stage for dialectical negations, that is, the negation of the previous negation, and a process of *Aufhebung* (referring simultaneously to transcendence, suppression, preserving, overcoming, and superseding), giving rise to sharp reversals and transformations, establishing qualitatively new emergent realities arising at a higher level, and a complex "spiral form of development" in which negation is never mere negation, but contains within it the positive (and vice versa).²¹

"The 'dialectical moment,'" Lenin wrote in his *Philosophical Notebooks*, "demands the demonstration of 'unity,' i.e., of the connection of negative and positive, the presence of this positive in the negative. From assertion to negation—from negation to 'unity' with the asserted—without this, dialectics becomes empty negation, a game, or scepticism [skepticism]."²² Although it has been common to reduce dialectics to the unity of opposites, such an approach would be completely barren, in Lenin's view, since it excludes dialectical negation.²³

In 1924, a major debate broke out between the mechanists, who were associated with figures like Akselrod and the militant mechanist-atheist Ivan Ivanovich Skvortsov-Stepanov, and the more dialectically oriented thinkers under the leadership of Debordin and his Institute of Red Professors.²⁴ The mechanists were tied more directly to natural science and to such leading theorists as Bukharin, and before him Plekhanov, both of whom had displayed mechanistic tendencies, though neither were entirely averse to dialectical analysis.²⁵ The dialecticians, in contrast, were far more

¹⁹ ↪ Marx and Engels, *Collected Works*, 25, 110–32, 492–502, 606–8.

²⁰ ↪ Marx and Engels, *Collected Works*, 25, 117; Marx, *Capital*, vol. 1, 443.

²¹ ↪ Marx and Engels, *Collected Works*, 25, 313; István Mészáros, *Marx's Theory of Alienation* (London: Merlin, 1975), 12.

²² ↪ I. Lenin, *Collected Works*, vol. 38 (Moscow: Progress Publishers, 1961), 227–31.

²³ ↪ Lenin, *Collected Works*, 38, 226; Mikhail Shirokov, *A Textbook on Marxist Philosophy*, ed. John Lewis (London: Left Book Club, 1937), 364–68. On the narrow interpretation of Lenin's dialectics as limited in comparison to Engels's dialectics, see Z. A. Jordan, *The Evolution of Dialectical Materialism* (London: Macmillan, 1967), 226–27.

²⁴ ↪ Yakhot, *The Suppression of Philosophy in the USSR*, 21–41.

²⁵ ↪ Bukharin's *Historical Materialism* was based on a mechanistic theory of equilibrium. He subsequently attempted to develop a dialectical approach to philosophy and science, in many ways transcending the debates of his time. His last effort of this kind, his *Philosophical Arabesques*, which engaged with ecological conceptions, was written in 1937 in prison prior to his execution in 1938, with the manuscript long remaining in Stalin's safe and only being released to Stephen Cohen under Mikhail Gorbachev. See Nikolai Bukharin, *Philosophical Arabesques* (New York: Monthly Review Press, 2005).

removed from natural science and focused on Hegelian idealism as critically mediated by the materialist tradition of Ludwig Feuerbach, Marx, Engels, and Lenin.²⁶

The main theoretical dispute dividing the mechanists and the Deborinists revolved around the proposition of the former that both organic and inorganic nature could be reduced simply to mechanical properties. This ran counter to a dialectics predicated on the existence of irreducible organisational forms, associated in particular with Engels's analysis in *Anti-Dühring* and *Dialectics of Nature*, the latter being published for the first time in 1925.²⁷ Deborin, as well as most other Soviet philosophers, argued that it was impossible to reduce in its entirety a qualitatively higher form, such as organic life, to a lower form, such as inorganic matter. Commenting on William Robert Grove's *The Correlation of Physical Forces* (1846), Engels wrote: "Chemical action is not possible without change of temperature and electric changes; organic life [is not possible] without mechanical, molecular, chemical, thermal, electric, etc. changes. But the presence of these subsidiary forms does not exhaust the essence of the main form in each case. One day we shall certainly 'reduce' thought experimentally to molecular and chemical motion in the brain; but does that exhaust the essence of thought?"²⁸ In this view, higher organisational levels, such as mind/thought, could not be reduced simply to lower organisational levels, even though the former were dependent on the latter. It was the distinction between different qualitative forms/levels/planes within material existence, Engels explained, that was the basis for the division of the various sciences, separating, for example, biology from chemistry and physics.

Nevertheless, the mechanists, representing the then dominant scientific outlook, challenged Engels's view that qualitative forms/levels differentiated reality, as well as thought. Thus, Skvortsov-Stepanov declared that Engels's claim that higher forms of material existence could not be explained simply by lower ones, and thus that mechanical forms of motion could not account in their entirety for the human psyche, had to be rejected outright.²⁹ Reductionism, in conformity with modern mechanistic science, was seen as a general principle applicable to all of existence, in line with positivism. Thus, it was often said that "the mind was a mere secretion of the brain"—a proposition first put forward by Pierre Jean Georges Cabanis in 1802 and even seemingly accepted by Charles Darwin.³⁰ In contrast, the Deborinist philosophers based their analysis on the dual critique of Hegelian idealism and of mechanistic materialism. On the issue of reductionism, they relied heavily on Engels's notion of quantitative change leading to qualitative transformation.

It soon became clear that neither side had the upper hand intellectually, since this was in large part a division between positivist natural science and dialectical philosophy. Yet, despite the philosophical stalemate, the Deborinists managed to triumph over their rivals through purely political means by 1929, using their superior control over the main institutions of Soviet philosophy to exclude the competing view.³¹

The Deborinist triumph, however, proved to be short-lived since, within a year, they were placed on the defensive due to an attack from a more powerful political quarter: the Communist Party hierarchy itself. This represented the direct

²⁶ ↪ Alex Levant, "Evald Ilyenkov and Creative Soviet Marxism," in *Dialectics of the Ideal: Evald Ilyenkov and Creative Soviet Marxism*, Alex Levant and Vesa Oittinen (Chicago: Haymarket, 2014), 12–13.

²⁷ ↪ David Bakhurst, *Consciousness and Revolution in Soviet Philosophy: From the Bolsheviks to Evald Ilyenkov* (Cambridge: Cambridge University Press, 1991), 34–41; Yakhot, *The Suppression of Soviet Philosophy in the USSR*, 22–26.

²⁸ ↪ Marx and Engels, *Collected Works*, 25, 527.

²⁹ ↪ Yakhot, *The Suppression of Philosophy in the USSR*, 29–30.

³⁰ ↪ William Seager, "A Brief History of the Philosophical Problem of Consciousness," in *The Cambridge Handbook of Consciousness*, Philip David Zelazo, Morris Moscovitch, and Evan Thompson (Cambridge: Cambridge University Press, 2007), 23, 27. See also Georgi Plekhanov, "*Marx*," in *Essays on the History of Materialism*, marxists.org.

³¹ ↪ Bakhurst, *Consciousness and Revolution in Soviet Philosophy*,

intervention of the so-called Bolsheviks of the party hierarchy into the struggles on the philosophical front. Although not directly defending the mechanists, considered a “right deviation,” the party hierarchy decided that it was necessary to rein in the Deborinists as a “left deviation.” The Deborinists were variously accused of being Mensheviks, idealists, vitalists, and weak in their criticisms of Trotsky and other left deviationists. The crushing blow, however, was Joseph Stalin’s official declaration in December 1930 that the Deborinists were “Menshevizing Idealists.” Deborin himself was denounced based on his Menshevik past of some three decades prior, while the dialecticians were also charged with being associated with the brilliant Marxist economist I. I. Rubin, author of *Essays on Marx’s Theory of Value*, who was executed in 1937.³²

The suppression of Soviet philosophy in the 1930s was inscribed in stone with the publication of Stalin’s “Dialectical and Historical Materialism” in 1938, as part of the official History of the Communist Party of the USSR—Bolsheviks: Short Course (often referred to as simply The Short Course).³³ In the rigid, dogmatic formulation provided in Stalin’s “Dialectical and Historical Materialism,” the notion of the negation of the negation, fundamental to the critical thought of Marx, Engels, and Lenin, was formally excluded. Historical materialism was reduced to a separate area subordinate to dialectical materialism. All categories were frozen. Marx’s Economic and Philosophical Manuscripts of 1844, first published in 1932, were treated as belonging to a pre-Marxist stage in his thought and were generally ignored or downplayed.

Soviet natural science, particularly the life sciences, including ecology, suffered a similar fate to that of philosophy.

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Bukharin had provided a crucial link between dialectical-materialist philosophy and natural science, working with agronomist, botanist, and geneticist Nikolai Vavilov, physiologist and biologist B. Zavadovsky, and historian of science-physicist Boris Hessen. All of these thinkers, together with other leading

Marxist scholars such as the philologist David Riazanov, editor of a critical edition of Marx and Engels’s Works, were purged. Bukharin himself was executed in 1938. The revolutionary dialectical insights that had emerged in the USSR in natural science and philosophy were replaced with narrow formulas that excluded critical thought.

As a result of these developments, the official doctrine of dialectical materialism was reduced to a crude mechanistic monism and positivism, opposed to a tendentious, if somewhat more critical, neo-Kantian dualism that was to pervade Western Marxism.³⁴ Nevertheless, a genuine dialectical materialism continued to exist in the recesses, refusing to be buried. As Galileo Galilei, caught up in the Inquisition, is reported to have said of the earth, no doubt apocryphally: “And yet it moves.”³⁵

³² ↪ Yakhot, The Suppression of Soviet Philosophy in the USSR, 43–76; Bakhurst, Consciousness and Revolution in Soviet Philosophy, 47–51; George Kline, introduction to Spinoza in Soviet Philosophy, George Kline (London: Routledge, 1952), 15–18; Helena Sheehan, Marxism and the Philosophy of Science (Atlantic Highlands: Humanities Press, 1985), 191–96; I. I. Rubin, *Essays on Marx’s Theory of Value* (Delhi: Aakar, 2008). It is worth noting that Georg Lukács, who was in the Soviet Union in 1930 working under David Riazanov, was not very sympathetic to the Deborinists at the time, considering some of the criticisms of them to be correct. Georg Lukács, “Interview: Lukács and His Work,” *New Left Review* 68 (July–August 1971): 57.

³³ ↪ Joseph Stalin, “Dialectical and Historical Materialism,” in History of the Communist Party of the Soviet Union—Bolshevik: Short Course, Communist Party of the USSR (Moscow: Foreign Languages Press, 1951), 165–206.

³⁴ ↪ A. Jordan, *The Evolution of Dialectical Materialism* (London: Macmillan, 1967), 252.

³⁵ ↪ Mario Livio, “Did Galileo Truly Say ‘and Yet It Moves’?,” *Scientific American* (blog), May 6, 2020, blogs.scientificamerican.com.

Western Marxism and the Negation of Dialectical Materialism

In contrast to official Soviet Marxism, what came to be known as Western Marxism, or the Western Marxist philosophical tradition, followed a radically different course. In this perspective, the dialectics of nature and, with it, the notion of dialectical materialism, was invalidated on the basis that dialectics required the identical subject-object—that is, the notion that human beings were both the subjects and objects of their own actions—and thus was not applicable to external nature, where the human subject was not present. With the exclusion of the natural realm insofar as it was

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separate from and even prior to human history, Western Marxism thus severed any direct relation of historical materialism to natural science and the universal metabolism of nature, effectively relegating the natural world to the realm of positivism. The result was a dualistic, two-world conception in which dialectics related simply to human history, not natural history (the

realm of the Kantian thing-in-itself), and in which Marxism was confined exclusively to the social.³⁶ Historical materialism was then robbed of any connection to nature as a force in itself, reducing the notion of materialism within Western Marxism simply to denaturalised political-economic relations. Western Marxist thinkers such as Herbert Marcuse and Theodor W. Adorno railed against the Soviet Short Course and Stalin's "Dialectical and Historical Materialism," but also frequently went beyond that, as in the case of Adorno and Lucio Colletti, to reject the transformative dialectics of Engels and Lenin, and even in some respects that of Marx and Hegel, gravitating instead toward Immanuel Kant.³⁷

Adorno's Negative Dialectics, often viewed today as one of the greatest contributions of the Frankfurt School within Western Marxism, had as its object the rejection of the "negation of the negation," and thus the positive moment in the dialectic. As Adorno wrote in the preface to his work: "Negative Dialectics is a phrase that flouts tradition. As early as Plato, dialectics meant to achieve something positive by means of negation; the thought figure of a negation of negation later became the succinct term. This book seeks to free dialectics from such affirmative traits without reducing its determinacy."³⁸

In Adorno's conception, "Marx was a Social Darwinist" in the sense that he saw natural history as the realm of natural necessity (also impinging on social history), to be transcended in human history by a leap to the realm of freedom. Marx's concept of nature was then, according to Adorno, ultimately the Enlightenment one, in which nature was simply there to be conquered and transcended by social praxis. For all their discussions in Dialectic of Enlightenment concerning "the domination of nature," Max Horkheimer and Adorno acquiesced to the view, which they imputed to Marx himself, of the "wholesale racket in nature"—that is, a kind of Hobbesian and Darwinian state of nature or war of all against all, seen as characterising all of Enlightenment thought. Marx himself was said to have shared these views,

³⁶ ↪ Karl Jacoby, "Western Marxism," in A Dictionary of Marxist Thought, Tom Bottomore (Oxford: Blackwell, 1983), 523–26; John Bellamy Foster, *The Return of Nature* (New York: Monthly Review Press, 2020), 16–21.

³⁷ ↪ Herbert Marcuse, *Soviet Marxism* (New York: Columbia University Press, 1958), 143–45; Theodor Adorno, *Negative Dialectics* (New York: Continuum, 1973), 355; Lucio Colletti, *Marxism and Hegel* (London: Verso, 1973).

³⁸ ↪ Adorno, *Negative Dialectics*, xix; Robert Lanning, In the Hotel Abyss: An Hegelian-Marxist Critique of Adorno (Leiden: Brill, 2014), 174. The contradictions and limitations of an exclusively idealist conception of dialectics "does not cardinal change," Ilyenkov writes, "if the emphasis is made on the 'negative,' while 'successes and achievements' are ignored as it is done today by the distant descendants of Hegel such as Adorno or Marcuse. Such change of emphasis does not make dialectics more materialist. Dialectics here begins to look more like the trickery of Mephistopheles, like the diabolical toolbox for the destruction of all human hopes." Ilyenkov, *Intelligent Materialism*, 50.

simply seeing freedom as the transcendence of necessity.³⁹ As Adorno opined: Marx “underwrote something as arch-bourgeois as the program of an absolute control of nature.”⁴⁰ Moreover, by specifying at the outset of his book *Negative Dialectics* that the object of his analysis was to exclude the negation of the negation, and thus the positive element in the dialectic, in a manner that ironically paralleled the dogmatic elimination of the negation of the negation within Stalin’s “Dialectical and Historical Materialism,” Adorno cast a light on his own negativity with respect to the prospect of revolutionary change.

Alfred Schmidt—who worked under Horkheimer and Adorno in writing his thesis and magnum opus, published in 1962 as *The Concept of Nature in Marx*—observed that Marx’s notion of the social metabolism between nature and society raised the issue of the dialectic of nature, or “nature’s self-mediation,” in an entirely defensible way. Schmidt, however, later disavowed this on the grounds that Marx saw such self-mediation of nature as restricted to human action, and then only in traditional communal societies, no longer applicable to modern bourgeois society, in which first nature, that is, nature in and of itself, had been largely subsumed by second nature, the social realm. “It is only the process of knowing nature,” Schmidt declared, “which can be dialectical, not nature itself.”⁴¹ This formulation retained the neo-Kantian dualism between nature and society, arguing that dialectical mediation was impossible without an active human subject, which was confined to the historical-social realm. Such views pushed dialectics, as envisioned in Western Marxism, in the direction of idealism.⁴²

Given the systematic exclusion of nature/ecology from dialectical thought within Western Marxism, it was often contended, even within Marxist circles, that the philosophy of praxis had nothing to contribute to ecological analysis. This was codified in Perry Anderson’s influential 1976 *Considerations on Western Marxism*, which claimed that “no major figure in the third generation of classical Marxism,” which Anderson narrowly associated with Western Marxism and its rejection of the dialectics of nature, was affected by “developments in the physical sciences.”⁴³ In his 1983 work, *In the Tracks of Historical Materialism*, Anderson declared that “problems of the interaction of the human species with its terrestrial environment [were] essentially absent from classical Marxism”—a proposition that would have been seen as absurd on its face even then, if it had not been for the fact that the entire domain of the dialectics of nature had already been systematically absented from Western Marxism, while classical Marxism’s ecological critique was simply treated as nonexistent.⁴⁴

Hence, both the Soviet conception of the “dialectics of nature” in the 1938 *Short Course*, centred on Stalin’s rigid separation of dialectical materialism and historical materialism, and the Western Marxist rejection of the dialectics of nature altogether, fell prey to narrow conceptions of reality. They thus failed to embrace what Engels called the totality of bodies, from the stars to the molecules, including the human mind and human society. “In effect, the problem of the dialectics of nature,” critical-realist philosopher Roy Bhaskar wrote, “reduces to a variant of the general problem of

³⁹ ↪ Ironically, the passage in Marx most often cited in defense of this interpretation ended not with the domination of nature as if a foreign enemy, but rather with the rational regulation of the social metabolism between humanity and nature by the associated producers, in line with the conservation of their energies and the development of human capacities: a model of sustainable human development. Karl Marx, *Capital*, 3 (London: Penguin, 1981), 959.

⁴⁰ ↪ Adorno, *Negative Dialectics*, 244, 355; Max Horkheimer and Theodor W. Adorno, *Dialectic of Enlightenment* (New York: Continuum, 1944), 254; Alfred Schmidt, *The Concept of Nature in Marx* (London: New Left Books, 1971), 156; John Bellamy Foster and Brett Clark, *The Robbery of Nature* (New York: Monthly Review Press,

⁴¹ ↪ Alfred Schmidt, *The Concept of Nature in Marx* (London: Verso, 1971), 164–66, 175–76, 195. Schmidt’s reversal was a direct response to the famous debate in France between Jean Hippolyte and Jean-Paul Sartre, as critics of the dialectics of nature, and Roger Garaudy and Jean-Pierre Vigier as its defenders. Schmidt clearly lined up with Hippolyte and Sartre, distancing himself from his earlier professed views.

⁴² ↪ See Sebastiano Timpanaro, *On Materialism* (London: Verso, 1975).

⁴³ ↪ Perry Anderson, *Considerations on Western Marxism* (London: Verso, 1976), 59.

⁴⁴ ↪ Perry Anderson, *In the Tracks of Historical Materialism* (London: Verso, 1983), 83.

naturalism, with the way it is resolved depending on whether dialectics is conceived sufficiently broadly and society sufficiently naturalistically to make its extension to nature plausible.”⁴⁵

The Struggle for Materialist Dialectics

Dialectical Materialism Redux

Still, it would be a mistake to think that the classical Marxist notion of the “dialectical conception of nature,” as Engels referred to it, was brought to a dead end, reduced to nothing without a remainder, either in the Soviet Union or in the West.⁴⁶ Rather, materialist dialectics constantly reemerged in all sorts of unexpected ways in changing historical circumstances. This can be seen most distinctly in the famous visit of Soviet natural scientists and philosophers to the Second International Congress of the History of Science in London in 1931, where Bukharin, Vavilov, Zavadovsky, Hessen, and others presented the results of Soviet dialectical natural science and philosophy.

In the audience at this historic meeting were world-renowned scientists and socialist thinkers, including Joseph Needham, J. D. Bernal, Lancelot Hogben, and Hyman Levy. (J. B. S. Haldane was not present but would take up the new ideas partly under the impetus of the same event.) In the course of the Soviet presentations, Bukharin sought to generate a dialectical-humanist conception of Marxist analysis, conducive to natural science, rooted in Marx’s “Notes on Adolph Wagner,” where some of Marx’s underlying ontological conceptions were made evident, along with the integration of biogeochemist Vladimir Vernadsky’s concept of the biosphere. Recognition of the reality in which human beings could be seen as “living and working in the biosphere” demanded, Bukharin insisted, an integrated materialist-dialectical view of process and interaction, contradiction, negation, and totality, in which both external nature and society participated. Hessen presented for the first time a sociology of science embodying materialist dialectics that explained Newton’s discoveries as they related to a bourgeois mechanistic view of the world. Vavilov provided an account of the Soviet discovery, through historical and materialist investigations, of the original geographical locales (now known as the Vavilov centers) of the world’s germplasm from which the major agricultural crops had arisen.⁴⁷

For Needham, it was Zavadovsky’s critique of both vitalism and mechanism from a dialectical-naturalist perspective in his article on “The ‘Physical’ and ‘Biological’ in the Process of Organic Evolution” that was to have the greatest impact in the development of his own approach to dialectical emergence in his famous theory of “integrative levels.” Zavadovsky argued that “biological phenomena, [although] historically connected with physical phenomena of inorganic nature, are

This concept of metabolism, seen as the material phenomenon connecting the physical-chemical and the biological through exchanges within nature, that was to become the basis of ecosystem analysis.

none the less not only not reducible to physico-chemical or mechanical laws, but within their own limits as biological processes display varied and qualitatively distinct laws,” that have “relative autonomy” from those of inorganic, physical forms. The “dynamic connection”

between the inorganic and the organic in the biological sphere was captured, he argued, by the concept of metabolism, linking higher biological forms to their physical-inorganic preconditions.⁴⁸

⁴⁵ ↪ Roy Bhaskar, *Reclaiming Reality* (London: Routledge, 2011), 122.

⁴⁶ ↪ Frederick Engels, *Ludwig Feuerbach and the Outcome of Classical German Philosophy* (New York: International Publishers, 1941), 59.

⁴⁷ ↪ I. Bukharin et al., *Science at the Crossroads* (London: Frank Cass and Co., 1971), 7; Foster, *The Return of Nature*, 358–73; Sheehan, *Marxism and the Philosophy of Science*, 206–9.

⁴⁸ ↪ Zavadovsky, “The ‘Physical’ and the ‘Biological’ in the Process of Organic Evolution,” in *Science at the Crossroads*, 75–76. Translation follows Needham’s version, which substitutes different for varied. Joseph Needham, *Time: The Refreshing River* (London: George Allen and Unwin, 1943), 243–44; Joseph Needham, *Order and Life* (Cambridge, Massachusetts: MIT Press, 1968), 45–46; Richard Levins and Richard Lewontin, *The Dialectical Biologist* (Cambridge, Massachusetts: Harvard University Press, 1985), 180.

It was this concept of metabolism, seen as the material phenomenon connecting the physical-chemical and the biological through exchanges within nature, that was to become the basis of ecosystem analysis. In the new ecological systems analysis, biological order as a form of emergent organisation was irreducible to the various elements of which it was constituted. “Translated into terms of Marxist philosophy,” Needham wrote, “it is a new dialectical level.” The core idea of dialectical naturalism was “that of transformation. How do transformations occur, and how can we make them occur? Any satisfactory answer must also be a solution to the problem of the origin of the qualitatively new.”⁴⁹

The British Red scientists of the 1930s and '40s were themselves products of a materialist tradition that was emergentist and ecological in its orientation. Most of these figures had also embraced socialism, particularly Marxian socialism. Needham recalled the influence of the “legendary” British zoologist E. Ray Lankester, who had been Darwin’s and Thomas Huxley’s protégé and a close friend of Marx, as well as the foremost representative of Darwinian evolutionary theory in Britain in the generation after Darwin and Huxley.⁵⁰ Lankester developed a systematic approach to the natural world with his concept of “bionomics,” which was the original term for ecology in Britain. (He also helped introduce the

The ecosystem concept included both the inorganic and organic realms and encompassed human beings themselves as both living within and major disturbers of ecosystems.

term *oecology* into the English language through supervising the 1876 translation of Ernst Haeckel’s *History of Creation*.) He focused on the complex interrelationships between organisms and their environments and on humans as disturbers of global ecological relations, developing a critique of “the effacement of

nature by man” rooted in the critique of capitalism.⁵¹

It was Lankester’s student Arthur Tansley, the foremost plant ecologist in England in the early twentieth century, who introduced the concept of ecosystem, based in part on the wider systems theory of Levy. As depicted by Tansley, the ecosystem concept included both the inorganic and organic realms and encompassed human beings themselves as both living within and major disturbers of ecosystems. The ecosystem notion was rooted fundamentally in the concept of metabolism, which had been the basis of early ecological systems analysis, and the treatment of nutrient cycling, a subject that occupied German chemist Justus von Liebig, Marx (in his concepts of social metabolism and the metabolic rift), and Lankester.⁵² Tansley’s ecosystem concept was thus to play a crucial role in the development of modern systems ecology.⁵³ Levy developed the notion of phase changes along with a unified systems theory rooted in historical-materialist conceptions in his *The Universe of Science* (1932) and *A Philosophy for a Modern Man* (1938).

Haldane was both the codiscoverer, alongside the Soviet geneticist A. I. Oparin, of the modern materialist theory of the origins of life on Earth, and was a major figure in the modern Darwinian synthesis, to which he later applied Marxian conceptions. Bernal, influenced by Engels’s dialectics of nature, developed an analysis of the negation of the negation within material processes in terms of the action of residuals, leading to new combinations and novel emergent developments, representing qualitatively new powers. Hogben applied critical materialist and dialectical methods to disprove the genetic theories underlying biological racism.⁵⁴ Other closely related figures included the literary and science critic Christopher Caudwell, who sought to bring together the dialectics of art and science (and who died

⁴⁹ ↪ Needham, *Order and Life*, 44–48.

⁵⁰ ↪ Joseph Needham, foreword to Marcel Prenant, *Biology and Marxism* (New York: International Publishers, 1943), v.

⁵¹ ↪ Foster, *The Return of Nature*, 24–72.

⁵² ↪ Peter Ayres, *Shaping Ecology: The Life of Arthur Tansley* (Oxford: Wiley- Blackwell, 2012), 43.

⁵³ ↪ Foster, *The Return of Nature*, 300–57.

⁵⁴ ↪ Foster, *The Return of Nature*, 337–39, 350–51, 390, 475, 367–412.

fighting in the Spanish Civil War); the historian of ancient philosophy Benjamin Farrington, who built on Epicurean philosophy and its relation to Marxism (inspired in part by Marx's dissertation on Epicurus); and the novelist, cultural theorist, and poet Jack Lindsay, whose 1949 *Marxism and Contemporary Science* was an exploration of ways in which to develop a broad dialectical and emergentist method encompassing nature and society.⁵⁵

Despite the suppression of the mechanists and the Deborinists, important work was still being done in Soviet philosophy in 1931, as evidenced by *A Textbook of Marxist Philosophy*, prepared by the Leningrad Institute of Philosophy under the direction of Mikhail Shirokov and published in English translation in 1937.⁵⁶ This work, which influenced Needham, was engaged in the critique of both mechanism (reductionism) and vitalism—a view that assumes some mysterious life force added to material reality that explains evolution.⁵⁷ *A Textbook of Marxist Philosophy* stood out at the time, since it relied on the conception of emergence as the key to materialist dialectics. As Shirokov wrote in a passage that was later singled out by Needham:

*A living organism is something that arose out of inorganic matter. In it there is no “vital force.” If we subject it to purely external analysis into its elements, we shall find nothing except physico-chemical processes. But this by no means denotes that life amounts to a single aggregate of these physico-chemical elements. The particular physico-chemical processes are connected in the organism by a new form of movement, and it is in this that the quality of the living thing lies. The new in a living organism, not being attributable to physics and chemistry, arises as the result of the new synthesis, of the new connection of physical and chemical movements. This synthetic process whereby out of the old we proceed to the emergence of the new is understood neither by the mechanists nor the vitalists.... The task of each particular science is to study the unique forms of movement characteristic of a particular degree of the development of matter.*⁵⁸

According to Shirokov, in the ancient philosophy of Epicurus, which had attracted Marx, “emergence is the uniting of atoms; disappearance their falling apart.” This served to explain a process of self-generation, “the origin and development of the universe, the movement of the human soul, etc.” Out of this had arisen the fundamental materialist view. In materialist dialectics, there is “ceaseless emergence and annihilation of the forms of...movement,” which continue to reproduce themselves “in ever new movement and in ever new qualities.”⁵⁹

However, all such advancements in materialist dialectics and science were shut down completely in 1938 with the publication of Stalin's “Dialectical and Historical Materialism.” What remained of Soviet philosophy consisted of a formalistic and mechanistic presentation of rigid “dialectical laws” conceived as a world outlook, rather than a critical philosophy. It was this that formed the background against which the more creative thinkers had to work. Nonetheless, in the next generation, the USSR produced major dialectical philosophers, most notably Evald Ilyenkov, whose dialectical logic was rooted not only in the Hegelian and Marxian traditions but also in the work of the pioneering

⁵⁵ ↪ Foster, *The Return of Nature*, 417–56, 526–29; J. D. Bernal, “Dialectical Materialism,” in Farrington, *The Faith of Epicurus*; Jack Lindsay, *Marxism and Contemporary Science* (London: Dennis Dobson, 1949).

⁵⁶ ↪ Shirokov, *A Textbook of Marxist Philosophy*, ed. John Lewis (London: Left Book Club, 1937).

⁵⁷ ↪ Needham, *Time*,

⁵⁸ ↪ Shirokov, *A Textbook of Marxist Philosophy*, 341, emphasis added to the word emergence, all other emphases in original. The sharp difference between the 1931 Shirokov text and the official view propounded by Stalin's 1938 “Dialectical and Historical Materialism” is evident in the fact that the fourth part of the former is devoted to “The Negation of the Negation,” which is entirely excluded in the latter.

⁵⁹ ↪ Shirokov, *A Textbook of Marxist Philosophy*, 137, 328. On Epicureanism and emergence, see A. A. Long, *From Epicurus to Epictetus* (Oxford: Oxford University Press, 2006), 155–77; A. A. Long, “Evolution vs. Intelligent Design in Classical Antiquity,” Berkeley Townsend Center, November 2006; John Bellamy Foster, Brett Clark, and Richard York, *Critique of Intelligent Design* (New York: Monthly Review Press, 2008), 49–64.

psychologist Lev Vygotsky, who argued that human cognitive abilities in general were substantially the result of activity and mediation with the social and cultural environment. Ilyenkov's philosophy was directed primarily at challenging, on materialist-dialectical grounds, the dualistic "two-worlds" epistemology of British empiricism, Cartesianism, and neo-Kantianism that dominated the bourgeois philosophical outlook.⁶⁰

Ilyenkov saw Marx's epistemology as one in which human activity or praxis creates the ideal world of thought through human production—that is, attempts to transform the world.⁶¹ Hence, there is a real identity of humanity and nature at the base of human cognition that is rooted in real activity. The "ideal," in Ilyenkov's sense, is not properly seen as something apart, an abstract entity, but is the basis of conceptions, knowledge, and information emanating from the dialectical process of human-social encounters with the material world, of which human beings themselves are a part. Dialectics is thus itself a manifestation of this active mediation with totality, arising "out of the process of the metabolism between man and nature."⁶² However, despite, or perhaps because of, the power of his analysis, Ilyenkov had trouble getting his work published. At the time of his death, half of his handwritten publications—including his much-celebrated *Dialectics of the Ideal*—remained on his desk, unpublished.⁶³

Despite the purge of some of the leading figures, there continued to be remarkable developments in Soviet science based on dialectical analysis up through the 1940s. This includes, notably, Vladimir Nickolayevich Sukachev's concept of biogeocoenosis in his work on forest ecology, representing a concept parallel to ecosystems but directly integrated with biogeochemical cycles and the entire biosphere in the sense pioneered by Vernadsky, thus pointing to a dialectical Earth System analysis.⁶⁴

Of even greater importance was the work of I. I. Schmalhausen in his *Factors of Evolution: The Theory of Stabilizing Selection*, first published in the USSR in 1947 and quickly translated into English in 1949. Theodosius Dobzhansky called Schmalhausen "perhaps the most distinguished among the living biologists in the USSR."⁶⁵ Schmalhausen, like the Red geneticist C. H. Waddington in England, developed a theory of the triple helix of gene, organism, and environment that provided a dialectical evolutionary and ecological view, one that constituted a sophisticated alternative to Lysenkoism with its anti-geneticist (or anti-Mendelian genetics) basis. Schmalhausen's dialectical approach was particularly evident in his notion of hierarchies or integrative levels structuring biological evolution, and in his explanation that latent, assimilated genetic traits that were accumulated during long periods of stabilising selection would come to the surface only when organisms faced severe environmental stress or certain thresholds were crossed, resulting in a process of rapid change.⁶⁶

⁶⁰ ↪ Bakhurst, *Consciousness and Revolution in Soviet Philosophy*, 17–22, 236–43.

⁶¹ ↪ Bakhurst, *Consciousness and Revolution in Soviet Philosophy*, 111–16, 236–43.

⁶² ↪ Evald Ilyenkov, *Dialectics of the Ideal* (Chicago: Haymarket, 2014), 78.

⁶³ ↪ Andrey Maidansky interviewed by Vesa Oittinen, "Evald Ilyenkov and Soviet Philosophy," *Monthly Review* 71, no. 8 (January 2020): 16.

⁶⁴ ↪ John Bellamy Foster, *Capitalism in the Anthropocene* (New York: Monthly Review Press, 2022), 316–23; V. N. Sukachev and N. Dylis, *Fundamentals of Forest Biogeocoenology* (London: Oliver and Boyd, 1964); V. N. Sukachev, "Relationship of Biogeocoenosis, Ecosystem, and Facies," *Soviet Soil Scientist* 6 (1960): 580–81; Levins and Lewontin, *The Dialectical Biologist*,

⁶⁵ ↪ Theodosius Dobzhansky, 1949 foreword to I. I. Schmalhausen, *Factors of Evolution: The Theory of Stabilizing Selection* (Chicago: University of Chicago Press, 1949, 1986), xv–xvii.

⁶⁶ ↪ David B. Wade, 1986 foreword to *Factors of Evolution*, v–xii; Lewontin and Levins, *Biology Under the Influence*, 75–80. The term triple helix is taken from Richard Lewontin, *The Triple Helix: Gene, Organism and Environment* (Cambridge, Massachusetts: Harvard University Press, 2000).

Following Engels, Schmalhausen saw heredity as both negative from an evolutionary standpoint, insofar as it blocked the historical evolution of organisms, and positive, in that it preserved organisation and created new organisational forms.⁶⁷ The significance of what came to be known as Schmalhausen's Law of stabilising selection, according to dialectical biologists Richard Lewontin and Levins, was that it indicated that "when organisms are living within their normal range of the environment, perturbations in the conditions of life and most genetic differences between individuals have little or no effect on their manifest physiology and development, but under severe or unusual general stress conditions even small environmental and genetic differences produce major effects." The result is that normal evolution of species is characterised by stabilisation punctuated by periods of rapid change, in which latent traits are mobilised in relation to environmental stress.⁶⁸ What sometimes appeared as a Lamarckian inheritance of acquired characteristics was actually a process of "genetic assimilation, the process whereby latent genetic differences within populations are revealed but not created by environmental treatment and therefore become available for selection" when certain thresholds are reached.⁶⁹

Factors of Evolution came out, however, just prior to Trofim Lysenko's political triumph in Soviet biology/agronomy in 1948. Soon after his book was published, Schmalhausen was denounced for promoting genetics and denying Lamarckian inheritance of acquired characteristics in his work on evolutionary ecology. As a result, Schmalhausen was dismissed from his posts as director of the Institute for Evolutionary Morphology at the Academy of Sciences and as head of the subdepartment of Darwinism at Moscow University. This was only reversed around the time of Stalin's death in 1953, when Sukachev led the way in combating and defeating Lysenko. As a result, Schmalhausen was eventually able to resume his career.⁷⁰ The final decades of the Soviet Union saw important new developments in Soviet environmental thought, including the introduction of the concept of ecological civilisation based on classical historical materialism, incorporating Marx's concept of social metabolism.⁷¹

The Struggle for a Critical Dialectics of Nature in the West

Within Marxism in the West, parallel struggles occurred, challenging the dominant Western Marxist philosophical tradition. Georg Lukács, a giant presence, was universally viewed as having generated Western Marxism as a distinct theoretical tradition, based on a brief footnote in *History and Class Consciousness* in which he had raised doubts about Engels's argument with respect to the dialectics of nature.⁷² Yet, contrary to myth, Lukács did not reject the dialectics of nature altogether in *History and Class Consciousness*, since in a later chapter in that work he referred, in a manner akin to Engels, to the "merely objective dialectics of nature" of the "detached observer."⁷³ Moreover, several years later, in his previously unknown and only recently published *Tailism* manuscript, Lukács defended the notion of the "dialectics in nature" on the basis of Marx's concept of social metabolism, representing the dialectical mediation of nature and

⁶⁷ ↪ Schmalhausen, *Factors of Evolution*, xix; Marx and Engels, *Collected Works*, 25, 492.

⁶⁸ ↪ Lewontin and Levins, *Biology Under the Influence*, 77; "Macroevolution," *New World Encyclopedia*, newworldencyclopedia.org; Levins and Lewontin, *The Dialectical Biologist*,

⁶⁹ ↪ Lewontin and Levins, *The Dialectical Biologist*,

⁷⁰ ↪ Georgy S. Levit, Uwe Hossfeld, and Lennart Olsson, "From the 'Modern Synthesis' to Cybernetics: Ivan Ivanovich Schmalhausen (1884–1963) and his Research Program for a Synthesis of Evolutionary and Developmental Biology," *Journal of Experimental Zoology* 306B (2005): 89–106; Foster, *Capitalism and the Anthropocene*, 323–24.

⁷¹ ↪ D. Ursul, ed., *Philosophy and the Ecological Problems of Civilisation* (Moscow: Progress Publishers, 1983); Foster, *Capitalism in the Anthropocene*, 331–32, 449–51.

⁷² ↪ Georg Lukács, *History and Class Consciousness* (London: Pluto), 24. It became customary in Western Marxist thought to refer to Lukács's footnote as a "critique." But even considering the common watering down of the notion of critique, it could hardly be said that a critique of Engels on the dialectics of nature could be carried out, even by Lukács, in what in English comes to a mere 110 words.

⁷³ ↪ Lukács, *History and Class Consciousness*, 207; Marx and Engels, *Collected Works*, 25, 492.

humanity through production.⁷⁴ Lukács worked under David Riazanov at the Marx-Lenin Institute in 1930, helping to decipher the text of Marx's Economic and Philosophical Manuscripts of 1844. These manuscripts greatly affected his subsequent analysis. This change in viewpoint was highlighted in his 1967 preface to *History and Class Consciousness* and in his later *Ontology of Social Being*.⁷⁵ The latter was based on Marx's social metabolism concept, seen as forming a dialectics of nature and society rather than expressly following Engels's approach to the dialectics of nature. Although examining with great depth Marx's metabolism analysis in *Capital*, Lukács failed to address Marx's notion of the metabolic rift, or ecological crisis.⁷⁶ Nevertheless, the social-metabolic ontology that he derived from Marx served to further undermine the negation of the dialectics of nature within the Western Marxist tradition that *History and Class Consciousness* had inspired. It is significant that Lukács's later work was largely disowned by the Western Marxist tradition, becoming so invisible that references to him in the West identified him almost entirely with what he had written in 1923 or before, largely excluding the almost five decades of work that were to follow.

If the dominant philosophical tradition within Marxism in the West was primarily defined by its rejection of the dialectics of nature, not all Western Marxist philosophers agreed. In 1940, the prominent French Marxist philosopher Henri Lefebvre published his *Dialectical Materialism*. In this work, Lefebvre sought to challenge the interpretation provided in Stalin's "notorious theoretical chapter in the History of the Communist Party of the USSR," reestablishing the dialectics of nature as a critical outlook while rejecting the simplistic view of dialectical materialism derived merely from reified "laws of Nature," viewed apart from the mediation of self-conscious thought. As Lefebvre wrote: "It is perfectly possible to accept and uphold the thesis of the dialectic in Nature; what is inadmissible is to accord it such enormous importance and make it the criterion and foundation of dialectical thought."

A crucial aspect of Lefebvre's argument was directed at the refusal of "institutional Marxism...to listen to talk of alienation." In Lefebvre's conception of dialectical materialism, it was necessary to integrate Marx's theory of alienation within the general conception of the metabolism of nature and society. He drew heavily on Levy's dialectical systems theory as presented in *A Philosophy for a Modern Man* in order to capture the reality of emergence. "Man's world," Lefebvre wrote in a passage that was to prefigure much of his later thought, "appears as made up of emergences, of forms (in the plastic sense of the word) and of rhythms which are born in Nature and consolidated there relatively, even as they presuppose the Becoming in Nature. There is a human space and a human time, one side of which is in Nature and the other independent of it."⁷⁷

Lefebvre's subsequent work proceeded in an increasingly ecological direction. In the early 1970s, he began to reflect on what is now known as Marx's theory of metabolic rift. As he wrote in *Marxist Thought and the City*, drawing on Marx, the growth of the capitalist urban structure "disturbs the organic exchanges between man and nature. 'By destroying the circumstances surrounding that metabolism, which originated in a merely natural and spontaneous fashion, it compels its systematic restoration as a regulative law of social production and in a form adequate to the full development of the human race'.... Capitalism destroys nature and ruins its own conditions, preparing and announcing its revolutionary

⁷⁴ ↪ Georg Lukács, *A Defense of History and Class Consciousness: Tailism and the Dialectic* (London: Verso, 2000), 102–7; Foster, *The Return of Nature*, 16–20.

⁷⁵ ↪ Lukács, *History and Class Consciousness*, xvii; Lukács, "Interview: Lukács and His Work," 56–57. Riazanov was purged from his position later in 1931 and executed in 1938.

⁷⁶ ↪ Georg Lukács, *The Ontology of Social Being 2: Marx's Basic Ontological Principles* (London: Merlin, 1978), 95; Georg Lukács, *The Ontology of Social Labour 3: Labour* (London: Merlin, 1980).

⁷⁷ ↪ Henri Lefebvre, *Dialectical Materialism* (London: Jonathan Cape, 1968), 13–19, 142.

disappearance.” Testifying to a kind of “reciprocal degradation” of the urban and the rural, external nature and society, he continued, “a ruined nature collapses at the feet of this superficially satisfied society.”⁷⁸

On December 7, 1961, six thousand people crowded into a Paris auditorium to hear a debate on the topic “Is the Dialectic Simply a Law of History or Is It Also a Law of Nature?” On the side of those who rejected the dialectics of nature were the existentialist Marxist Jean-Paul Sartre and the left Hegelian philosopher Jean Hippolyte; on the side of those defending it were the French Communist philosopher Roger Garaudy and the prominent young physicist Jean-Pierre Vigier. Sartre, Hippolyte, and Garaudy had all written extensively on the issue of the dialectics of nature, while Vigier’s views on dialectical materialism were less well known and stood out since directly related to natural science.

Vigier argued that notions of the dialectics of nature long preceded historical materialism and could be traced back hundreds and thousands of years. “Every day,” he declared, “science further verifies the profound saying of Heraclitus which is at the root of the dialectic: everything is flux, everything is transformed, everything is in violent movement.” Such dialectical movement was the product of “the assemblage of forces that necessarily evolve along opposing lines, [and] illustrate the notion of contradiction.” Moreover, “the unity of opposites,” at the core of most conceptions of the dialectic, has to be “understood as the unity of the elements of one level which engender the phenomena of a higher level.” This was in accordance with the “abrupt rupture” of the preceding equilibrium and emergence of new integrative levels and novel forms, which constitute new “totalisations,” or “partial totalities.” In this sense, “qualitative leaps of the dialectic are found precisely on the borderlands where one passes from one state of matter to another, for example from the inorganic to the organic.” In ecological terms, the problem, as Bernal had stated, is one of determining the “order of succession” arising from the metabolism, or material exchange, within nature (and society). “The very practice of science, its progress, the very way in which today it has passed from the static analysis of the world to the dynamic analysis of the world, is what is progressively elaborating the dialectics of nature under our eyes.” In Vigier’s view, “with Marx, science broke into philosophy.”⁷⁹ Vigier’s work reflected the rapid development of dialectical conceptions in science in the twentieth century with the rise of systems theory, often seen in dialectical terms, overtaking the contributions of dialectical social science.⁸⁰

Ecosocialism and the Dialectics of Ecology

In a dialogue with Hegel on dialectics on October 18, 1827, Johann Wolfgang von Goethe commented: “I am certain that many of those made ill by dialectics would find healing in the study of nature.” Goethe’s statement makes sense only if dialectics is seen as simply something apart from nature, merely “the systematised spirit of contradiction that we

Marxism has been able to bring new dialectical tools of analysis to bear on deciphering human society as an emergent form of nature, which is now, in its current alienated form, pointing toward its own annihilation.

all have inside of us,” as Hegel defined it on that occasion.⁸¹ Yet, in the Hegelian idealist conception—as in the classical Marxian materialist one—there can be no rigid separation between a dialectics of society and a dialectics of nature. Notions of the dialectics of nature

and organicist forms of materialism precede Marxism by thousands of years (not only in the work of the ancient Greeks,

⁷⁸ ↪ Henri Lefebvre, *Marxist Thought and the City* (Minneapolis: University of Minnesota Press, 2016), 121–22, 140; Marx, *Capital*, 1, 637–38; John Bellamy Foster, Brian M. Napolitano, Brett Clark, and Pedro S. Urquijo, “Henri Lefebvre’s Marxian Ecological Critique,” *Environmental Sociology* 6, no. 1 (2019): 31–41.

⁷⁹ ↪ Jean-Pierre Vigier, “Dialectics and Natural Science,” in *Existentialism Versus Marxism*, George Novack (New York: Dell, 1966), 243–57. Vigier made a point in his text of criticizing Stalin’s “Dialectical and Historical Materialism” as “dogmatic and mechanistic,” 151.

⁸⁰ ↪ Carles Soriano, “Epistemological Limitations of Earth System Science to Confront the Anthropocene Crisis,” *Anthropocene Review* 9, no. 1 (2020): 112, 122.

⁸¹ ↪ Johann Wolfgang von Goethe and G. W. F. Hegel, quoted in Johann Peter Eckermann, *Conversations with Goethe* (London: Penguin, 2022), 559–60.

but also in Chinese philosophy, beginning in the Warring States Period during the Zhou Dynasty).⁸² Nevertheless, Marxism has been able to bring new dialectical tools of analysis to bear on deciphering human society as an emergent form of nature, which is now, in its current alienated form, pointing toward its own annihilation.

Criticism and self-criticism are essential in the development of science. In the case of Marxism, this requires that the contradictions and divisions that arose over the dialectics of nature—contradictions and divisions that largely emanated from political realities—have to be healed in a new synthesis of theory and practice. Ecosocialism, which first emerged as a definite theoretical and political movement in the 1980s, matured in this century largely through the recovery of Marx's theory of metabolic rift, which has enabled a more complete understanding of the ecological crises of our time. But ecological materialism cannot go forward on the basis of Marx's now-famous metabolism analysis alone. It requires the recovery and reconstruction of classical Marxism's notion of dialectical naturalism, which constituted the second foundation of Marxism and has played a crucial role in the development of critical ecology from the late nineteenth and early twentieth centuries to the present day. This means overcoming the divisions that have developed within Marxism, in which both official Soviet Marxism and Western Marxism reduced nature to positivism while negating the negation of the negation.

Since the ecological crisis has placed the question of the dialectics of ecology front and center, it is significant that one of the bases from which today's ecosocialist/ecological Marxist critique stems is natural science. This is most clearly evident in the work of figures like Levins, Lewontin, and Stephen Jay Gould, who pushed forward a dialectical critique of reductionist science in the context of the developing catastrophic relation of capitalism and the environment. Intrinsic to this was a recognition of the weaknesses in much of Marxian theory due to the abandonment of the dialectics of nature. Levins was inspired from his youth by such figures as Marx, Engels, Lenin, Bernal, Needham, Haldane, Caudwell, Oparin, Schmalhausen, and Waddington. He was explicit about the failure of the Western Marxist tradition to unify its analysis with that of the Red scientists, and thus its inability on this basis to develop a meaningful analysis of the ecological crisis.⁸³ Writing in "A Science of Our Own" in *Monthly Review* in 1986, he stated:

*In the quest for respectability many Western European Marxists, especially among the Eurocommunists, are attempting to confine the scope of Marxism to the formulation of a progressive economic program. They therefore reject as "Stalinism" the notion that dialectical materialism has anything to say about natural science beyond a critique of its misuse and monopolization.... Both the Eurocommunist critics of dialectical materialism and the dogmatists [those who reduce dialectical materialism to mere formalism], accept an idealized description of science.*⁸⁴

A Marxist approach to science, Levins argued, required recognizing the importance of critical dialectical materialism in combating reductionism and positivism, as well as attention to how science itself had often been corrupted by capitalism, damaging the human relation to the earth. Levins and Lewontin published their seminal work *The Dialectical Biologist* in 1985, bringing back dialectical materialism as the basis of a critique of reductionism in biology, ecology, and society. This was followed in 2007 by *Biology Under the Influence*, which advanced a dialectical systems ecology. A

⁸² ↪ Joseph Needham, *Within Four Seas: The Dialogue of East and West* (Toronto: University of Toronto Press, 1969), 27, 97.

⁸³ ↪ Richard Levins, "Touch Red," in *Red Diapers: Growing Up in the Communist Left*, Judy Kaplan and Linn Shapiro (Urbana: University of Illinois Press, 1998), 264; Lewontin and Levins, *Biology Under the Influence*, 366–67.

⁸⁴ ↪ Richard Levins, "Science of Our Own: Marxism and Nature," *Monthly Review* 38, no. 3 (July–August 1986): 5.

key proposition was that “contradictions between forces are everywhere present in nature, not only in human social institutions.”⁸⁵

Gould, like Levins and Lewontin, consciously employed the dialectical method in all of his work on evolutionary theory, focusing in particular on (1) “emergence, or the entry of novel explanatory rules in complex systems, laws arising from

Earth as a place of species habitation would recover in hundreds of millions of years from the worst that humanity could deliver in terms of global thermonuclear war (or climate change)—but humanity itself would not.

‘nonlinear’ or ‘nonadaptive’ interactions among constituent parts that therefore, in principle, cannot be discovered from properties of parts considered separately”; and (2) contingency, which meant that phenomena in nature, particularly those at higher emergent levels, had to be examined historically.⁸⁶ Gould warned that Earth as a place of

species habitation would recover in hundreds of millions of years from the worst that humanity could deliver in terms of global thermonuclear war (or climate change)—but humanity itself would not.⁸⁷ Levins, Lewontin, and Gould all rejected some of the crudities of the official dialect in Soviet thought while seeking to rescue the dialectics of nature as crucial not only to the Marxian critique, but to a theoretical-practical orientation to the world as a whole. Other dialectical biologists, such as John Vandermeer and Stuart A. Newman, have followed along in the same tradition.⁸⁸

Analysis of the two most important works in Marx’s hitherto unpublished intellectual corpus resulted in major developments in materialist dialectics in István Mészáros’s two pathbreaking works, Marx’s Theory of Alienation (1971) and Beyond Capital (1995). Mészáros was Lukács’s close colleague prior to the 1956 Soviet invasion of Hungary, which compelled him to leave the country. In Marx’s Theory of Alienation, Mészáros showed that Marx’s basic ontological conception in the Economic and Philosophical Manuscripts embraced both the alienation of labor and the alienation of nature, tied together in Marx’s ontological notion of human beings as the “self-mediating beings of nature” and their self-alienation under capitalism.⁸⁹ In Beyond Capital, which drew on Marx’s Grundrisse, he argued that the planetary ecological crisis was the product of capitalism’s inability to accept even the boundaries of the earth itself as a limit on uncontrolled accumulation, and that the ecological crisis was thus a core aspect of the structural crisis of capital.⁹⁰ Utilizing Marx’s concept of metabolism, Mészáros presented capital as an alienated form of social metabolic reproduction based on second-order mediations of labor and nature. This analysis was to play an important role in the development of ecological Marxism, undermining narrow conceptions of Marx’s dialectic and providing a systems theory rooted in Marx that bridged the ecological and social divide and helped reunify revolutionary theory and practice, impacting Hugo Chavez and the Bolivarian Revolution in Venezuela.⁹¹

⁸⁵ ↪ Levins and Lewontin, *The Dialectical Biologist*, 279; Lewontin and Levins, *Biology Under the Influence*.

⁸⁶ ↪ Stephen Jay Gould, *The Hedgehog, the Fox, and the Magister’s Pox* (New York: Harmony, 2003) 201–3; Richard York and Brett Clark, *The Science and Humanism of Stephen Jay Gould* (New York: Monthly Review Press, 2011), 95–96.

⁸⁷ ↪ Stephen Jay Gould, interviewed in Wim Kayzer, *A Glorious Accident* (New York: W. H. Freeman, 1997), 83, 99–100, 104.

⁸⁸ ↪ John Vandermeer and Ivette Perfecto, *Ecological Complexity and Agroecology* (London: Routledge, 2018); John Vandermeer, “Ecology on the Heels of the Darwinian Revolution: Historical Reflections on the Dialectics of Ecology,” in *Science with Passion and a Moral Compass: A Symposium Honoring John Vandermeer*, Publication no. 1, Ecology and Evolutionary Biology, University of Michigan, Ann Arbor, 2020; John Vandermeer, “Objects of Intellectual Interest Have Real Impacts: The Ecology (and More) of Richard Levins,” in *The Truth Is the Whole: Essays in Honor of Richard Levins*, Tamara Awerbuch, Maynard S. Clark, and Peter J. Taylor (Arlington, Massachusetts: Pumping Station, 2018), 1–7; Stuart A. Newman, “Marxism and the New Materialism,” *Marxism and the Sciences* 1, no. 2 (Summer 2022): 1–12.

⁸⁹ ↪ Mészáros, *Marx’s Theory of Alienation*, 162–64.

⁹⁰ ↪ István Mészáros, *Beyond Capital* (New York: Monthly Review Press, 1995), 170–77, 874–77.

⁹¹ ↪ István Mészáros, *The Necessity of Social Control* (New York: Monthly Review Press, 2015); John Bellamy Foster, “[Mészáros and Chávez: ‘The Point from Which to Move the World Today’](#),” *Jus Semper*, September 2022..

Another key development in dialectical thought, bridging the gulf between the crude formalism of official Soviet thought and Western Marxism, was provided by the dialectical critical-realist philosophy of Bhaskar, which sought to renew ontology on materialist/realist foundations by reintegrating the question of naturalism into Marxian philosophy and ultimately developing a dialectical critical realism. It represented a full-scale attack on both neo-Kantian dualism, along with two-world dualisms in general, and on what Bhaskar called “the epistemic fallacy” that had subsumed ontology (the theory of the nature of being) within epistemology (the theory of knowledge). This went hand-in-hand with Bhaskar’s rejection of the “anthropic fallacy,” or the exclusive “definition of being in terms of human being.”⁹²

Bhaskar’s work started from naturalist, realist, and materialist foundations, and working from there systematically developed a dialectical ontology conducive to a transformative praxis. In *Dialectic: The Pulse of Freedom*, this led to a dialectical critical realism that incorporated on multiple planes Engels’s three ontological principles of the transformation of quantity into quality and vice versa, the unity of opposites, and the negation of the negation. In Bhaskar’s analysis, the first of these principles was represented by the dialectics of emergence, the second by the dialectics of internal relations, and the third by what Bhaskar was to call the absencing of absence, incorporating the reality of past, present, and future potentials and possibilities in the understanding of the dialectic of continuity and change.⁹³

Bhaskar’s dialectical naturalism, like that of Marx and Engels, led him in the end to a consideration of ecological crisis. As he explained, “The limit at the plane of material transactions with nature”—Marx’s social metabolism—“comes from the fact that human beings are natural beings. Nature is not apart from us; we are a part of it. The destruction of nature is not only murder but suicide and must be treated as such.” From this it could be adduced that there “is a double impossibility theorem: it is not possible [at this stage] to have growth and ecological viability, and because it is not possible to have capitalism without growth, it is also not possible to have ecological viability with capitalism.”⁹⁴ It followed that “at the level of material transactions with nature...it is absolutely unarguable that what we need is, from the point of view of the climate as a whole, less growth, that is, degrowth, and degrowth coupled with a radical redistribution of income.... This idea of degrowth would be associated with the idea of a simplification of social existence.”⁹⁵ For Bhaskar, there was never any question about the necessity of a conception of the dialectics of nature, only about the conceptions currently held, leading him to develop his dialectical critical reason and ultimately resulting in his advocating for a revolutionary praxis of degrowth.

Marx’s theory of metabolic rift, or his theory of ecological crisis, was fully recovered only in the twenty-first century.⁹⁶ It derives its importance from its materialist dialectical conception of the alienated metabolism of nature and society under capitalism, a system that is now exploiting the world’s population as never before while expropriating the earth on which humanity depends. This is the one critical perspective that fully encompasses both the social and extrahuman dimensions of the environmental crisis, seeing the class and ecological contradictions of capitalism as two sides of a single dynamic. The social metabolism represented by production mediates the material relation of humanity to ecological systems all the way from local ecosystems up to the Earth System.

⁹² ↪ Roy Bhaskar, *Plato Etc.* (London: Verso, 1994), 251, 253.

⁹³ ↪ Roy Bhaskar, *Dialectic: The Pulse of Freedom* (London: Verso, 1993), 150–52.

⁹⁴ ↪ Roy Bhaskar, “Critical Realism in Resonance with Nordic Ecophilosophy,” in *Ecophilosophy in a World of Crisis*, Roy Bhaskar, Karl Georg Hoyer, and Peter Naess (London: Routledge, 2012), 21–22.

⁹⁵ ↪ Roy Bhaskar, *The Order of Natural Necessity* (Gary Hawke, 2017), 146.

⁹⁶ ↪ The two works that initiated this analysis were both published in 1999: Paul Burkett, *Marx and Nature* (Chicago: Haymarket, 1999, 2014); John Bellamy Foster, “Marx’s Theory of Metabolic Rift,” *American Journal of Sociology* 105, no. 2 (September 1999): 366–405.

This accords with Earth System science itself, which focuses on the disruption of the Earth System metabolism resulting in the anthropogenic rift in the biogeochemical cycles of the planet, creating the present habitability crisis. The result of this recovery of Marx's metabolic rift theory has been a formidable array of explorations of the social dimensions of the Earth System crisis, stretching from the metabolism of the soil to the climate to Earth System analysis.⁹⁷ Nevertheless, Marx's conception of the metabolic rift is only truly useful insofar as it provides us with a more active understanding of

Today, the world is faced with two opposing tendencies.

the social metabolism of human beings and the earth in all of its complexity as part of an overall materialist dialectics. For this, what is necessary is both a dialectics of society and a dialectics of nature, forming the basis of a new global

environmental praxis.

Today, the world is faced with two opposing tendencies. One is the attempted acceleration of capital through the financialization of nature based on market forces and associated with processes of so-called decarbonisation and dematerialisation. The goal here is to subsume the world within the abstract logic of money as a substitute for real-world existence—an alienated logic that can only lead to total disaster, the barren negation of humanity itself. The other is the emerging struggle for planned degrowth and sustainable human development aimed at shifting power from global capital to workers on the ground and in their communities throughout the planet, representing the potential new power of an emerging environmental proletariat. This necessitates the merging of the economic and environmental struggles of the exploited and expropriated populations throughout the world in a new, broader form of cooperation. People at the grassroots are being driven to defend not just their work, but also their environments and their communities, and indeed, the habitability of the planet itself, conceived as a home for humanity and all other species. For this, however, we need a new, revolutionary dialectics of ecology.

⁹⁷ ↪ The major contributions of metabolic rift theory are too numerous to enumerate here. A few key works, related especially to the dialectics of nature, include: John Bellamy Foster, *Marx's Ecology* (New York: Monthly Review Press, 2000); John Bellamy Foster, Brett Clark, and Richard York, *The Ecological Rift* (New York: Monthly Review Press, 2010); Ian Angus, *Facing the Anthropocene* (New York: Monthly Review Press, 2016); John Bellamy Foster and Paul Burkett, *Marx and the Earth* (Chicago: Haymarket, 2016); Kohei Saito, *Karl Marx's Ecosocialism* (New York: Monthly Review Press, 2017); Fred Magdoff and Chris Williams, *Creating an Ecological Society* (New York: Monthly Review Press, 2017); Stefano Longo, Rebecca Clausen, and Brett Clark, *The Tragedy of the Commodity: Oceans, Fisheries, and Aquaculture* (New Brunswick, New Jersey: Rutgers University Press, 2015); Carles Soriano, "Capitalocene, Anthropocene, and Other '-Cenes,'" *Jus Semper*, March 2023; and Foster and Clark, *The Robbery of Nature*.

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