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Ecology

The Heavy Legacy of Leon Trotsky

- Features -

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For more than twenty years, revolutionary Marxists have been questioning themselves: was their missed appointment with ecology, in the 60s to 90s of the last century, attributable to Marx and Engels? If so, to what extent? Hundreds of pages have been written on the subject. Although the thesis of a "Marx ecology," defended by J.B. Foster, is somewhat exaggerated, no one dares to seriously maintain anymore that the authors of the Communist Manifesto were productivists who fetishized technology and had no idea of natural limits...

Why did their environmental concerns find so little echo afterward? The victory of the revolution in a peripheral country – combining the demands of what was called "rattrapage" ("catch-up" to the level of development of the central capitalist countries, translator's note) and the new possibilities of a centralized policy aimed at radical transformation – was certainly responsible for much of the monstrous damage of Stalinist productivism. However, it would be wrong to attribute everything to the Stalinization of the USSR: the enthusiasm about the possibility that science might be put at the service of progressive transformations was undoubtedly not for nothing in the unlimited techno-scientific optimism – quite removed from Marx's prudence – expressed notably by Leon Trotsky. It is important to return to this.

After putting ecological issues on the agenda for several years without giving them sufficient weight, the Fourth International adopted a resolution "Ecology and Socialism" in February 2003 [1]In 2010, it adopted a specific resolution on climate change and declared itself in favor of ecosocialism [2] Following this line, the movement should dot the i's: its founder had the immense merit of opposing Stalinism, which allowed the transmission of the Marxist-revolutionary heritage to the post-war generations. Unfortunately, the legacy was incomplete: the tools elaborated by Marx and Engels for an understanding of the metabolism between humanity and nature were not part of it. This article has no other purpose than to note this and explain it, in the hope of contributing to deepening the "ecologization of Marxism."

A Very Dominating Domination

"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. When the Italians of the Alps used up the pine forests on the southern slopes, so carefully cherished on the northern slopes, they had no inkling that by doing so they were cutting at the roots of the dairy industry in their region; they had still less inkling that they were thereby depriving their mountain springs of water for the greater part of the year, and making it possible for them to pour still more furious torrents on the plains during the rainy seasons. Those who spread the potato in Europe were not aware that with these farinaceous tubers they were also spreading scrofula." [3]

Among other reflections, this long citation from Engels shows that the founders of Marxism had a dialectical vision of progress in humanity's capacity to transform the environment. Trotsky presents a different tone. In a work dated 1923, the founder of the Red Army writes:

"The present distribution of mountains, rivers, fields, meadows, steppes, forests and seashores cannot be considered

final. Man has already made changes in the map of nature that are not few nor insignificant. But these are mere student essays in comparison with what is coming. Faith only promised to move mountains; but technology, which takes nothing 'on faith,' is actually able to cut down mountains and move them. Up to now this was done on the basis of industrial considerations – mines, tunnels, etc. In the future this will be done on an immeasurably larger scale, according to more far-reaching industrial and artistic plans. Man will occupy himself with re-registering mountains and rivers, and will earnestly and repeatedly make improvements in nature. In the end, he will have rebuilt the earth, if not in his own image, at least according to his own taste. We have not the slightest fear that this taste will be bad. (...) Socialist man will master the whole of nature (...) by means of the machine. He will point out places for mountains and for the courses of rivers, and will lay down rules for the oceans." [4]

It is true that Trotsky, when he wrote these lines, had not read The Dialectics of Nature, which was published in 1925 (in German). But this work was accessible to the Bolshevik leaders from 1920-21, since Engels' manuscripts were in the custody of the German Social Democrats who had handed them over to the Russian party after the October Revolution [5]. Moreover, it should be noted that even in 1923, the very year of Literature and Revolution, Trotsky could have been inspired by numerous texts by Marx and Engels on the subject of the human-nature relationship.

In particular, he could have taken note of Marx's warning about "a rift in the interdependent process of social metabolism" – the first formulation of the concept that would later evolve into what we know today as the "ecological crisis." As early as 1866, Marx wrote to Engels: "(...) we have the irrefutable proof, based on geology, etc., that after a certain period the earth itself must die a natural death... But I consider it very important that Liebig's [...] negative aspects should be popularized. Moreover, apart from the influence of the depletion of the forests, etc. [...] on the springs, etc., the fact that cultivation, when it proceeds in a natural way and is not consciously controlled [...] leaves deserts behind it (Persia, Mesopotamia, etc., Greece)" [6].

Engels, on the other hand, shows much more epistemological prudence. In the Anti-Dühring, he writes: "Here we have again the same contradiction that we encountered earlier with regard to the character of human thought, necessarily conceived as absolute, and its reality in individual men of obviously limited thought; this is a contradiction which can only be resolved in the infinite progression, in the succession, at least practically infinite for us, of human generations. In this sense human thought is sovereign as much as it is not sovereign, and its capacity for knowledge is unlimited as much as it is limited" [7] Lenin takes up the same idea in simpler terms: "We shall approach objective truth (without however ever exhausting it)" [8].

Trotsky is less prudent. In 1925, when he is president of the Scientific and Technical Council of Industry and therefore responsible for all Soviet scientific institutions, he speaks before an audience of chemists. His speech praises, based on "techno-scientific optimism," the great Russian scientist Mendeleev, inventor of the periodic table of elements. Lev Davidovich expresses himself with transport: "Mendeleev's faith in the unlimited possibilities of science, foresight and mastery of matter must become the common scientific faith of the chemists of the socialist homeland. Through the mouth of one of its scholars, Du Bois-Reymond, the social class that is leaving the historical stage confides to us its philosophical motto: 'Ignoramus, ignorabimus!' that is, 'We do not understand, we shall never learn!' Lie, responds scientific thought which links its fate to that of the ascending class. The unknowable does not exist for science. We shall understand everything! We shall learn everything! We shall rebuild everything!" [9]

The will to give the masses and militants confidence in their capacity to take their fate into their own hands is a constant in Trotsky, and sometimes expresses itself in a somewhat excessive manner. But here there is more. Indeed, his enthusiasm for Mendeleev is motivated, in particular, by the fact that the techno-scientific optimism of the great scientist served as a basis for his struggle against the Malthusians. It is understandable that Trotsky wanted to support Mendeleev on this point. However, to confront the Principle of Population, Marx had no need of a faith in the unlimited possibilities of science: he contented himself with noting by reductio ad absurdum that it would simply be impossible for population to exceed the food capacities of the environment and that, if Malthus had been right, that is, if there had been an insurmountable contradiction between exponential population growth and linear growth of

agricultural production, then the first man on earth would already have been one too many. Arguments of this type were sufficient for him to demonstrate that the pastor Malthus was doing pseudo-science and that his theories were in fact nothing more than a cynical, repugnant and hypocritical plea against assistance to the poor.

The contrast is striking. Marx's reasoning is concrete, dialectical. That of Trotsky takes the form of a profession of faith in Science with a capital S, in technological Progress with a capital P. In Capital, Marx emphasizes that capitalist production "disturbs the metabolic interaction between man and the earth, i.e., prevents the return to the soil of its constituent elements consumed by man in the form of food and clothing; it therefore violates the conditions necessary to lasting fertility of the soil" [10]. For Marx, the solution to this disruption does not reside in the unlimited development of the productive forces, but in the transition to a mode of production that permits "the rationally regulated interchange of organic metabolism between man and nature" under "conditions most favorable to, and worthy of, their human nature."

For Trotsky, on the other hand, "the machine" – technology – seems to be the magic solution to all problems: "Socialist man will master the whole of nature (...) by means of the machine" [11]. This fetishization of technology is all the more surprising because it contrasts with the quality of his analysis in all other domains, notably political analysis. It seems that in this case, the founder of the Red Army let himself be carried away by the futurist enthusiasm of the era.

Science and Technology: Linear Progress

It should be emphasized, however, that this fetishization was not specifically Trotskyist: it permeated the whole of society, including the workers' movement. However, what differentiates Trotsky from Marx and Engels is his linear conception of scientific and technological development [12]. For the founder of historical materialism, the development of the productive forces is contradictory. It does not automatically and necessarily serve human progress – everything depends on social relations of production. Marx and Engels knew well, for example, that capitalists could perfectly well block innovations in order to preserve their profits [13]. Trotsky seems to ignore this fundamental insight.

In the same work, Culture and Socialism (1927), he writes: "The development of science and technology proceeds by its own inner logic, obeying its own laws, and does not stop for political and social obstacles. If some scientific discovery or technical invention does not immediately find application in one country because of the low level of culture or unfavorable social conditions, it will be applied in another country" [14]. This is not dialectical thinking: it is pure technological determinism.

This vision appears with even more clarity in the famous text where Trotsky imagines communist America: "If America Should Go Communist" (1934). He evokes the transformation of nature in the most grandiose terms: "The map of America will be redrawn. The forests will be made to march toward the North. The swamps will be drained, the climate will be ameliorated. The peaks which are in the way will be razed. The courses of the rivers will be changed. America will be transformed from what it is today. The Communist method of applying technology will create a new geography" [15].

Again, we find the same imperial tone, the same absence of any ecological consciousness, the same blind faith in the omnipotence of technology. In 1926, in a speech on "Radio, Science, Technology and Society," Trotsky goes even further in technological fetishism: "Radio will transform every hut, as distant and isolated as it may be, into an organ sensitive to the life of all humanity. The radio will liquidate the difference between the city and the countryside (...)" [16].

This linear vision of technological progress contrasts sharply with the more nuanced approaches of Marx, Engels, and even Lenin. In "The Agrarian Question and the Critics of Marx," Lenin writes: "Technology by itself is neither progressive nor reactionary. Everything depends on its application, on the social relations within which it is applied" [17].

Socialist Eugenics, Socialist Alchemy

The techno-scientific enthusiasm of the founder of the Red Army goes hand in hand with positions that, seen from today, seem frankly disturbing. Still in Literature and Revolution, he writes about the new socialist human: "Man will become immeasurably stronger, wiser and more subtle; his body will become more harmonized, his movements more rhythmic, his voice more musical. The forms of life will become dynamically dramatic. The average human type will rise to the heights of an Aristotle, a Goethe, or a Marx. And above this ridge new peaks will rise."

This passage could still be interpreted in terms of cultural development and education. But Trotsky goes further. In the same work, he evokes the possibility of acting on human biology: "Once he has done with anarchic forces of his own social organization, man will throw himself into the task of mastering the elements, of conquering the weather and the climate, of taming the rivers and the oceans, and of improving on the biological species, not excluding his own."

This is no longer a question of culture or education, but of "improving the biological species." The formulation is ambiguous, but it is difficult not to see in it a reference to eugenic practices. That Trotsky could have been tempted by such ideas is not so surprising when we know that numerous progressive intellectuals of the era, including H.G. Wells, George Bernard Shaw, and even Alexander Graham Bell, were favorable to certain eugenic practices in the name of scientific progress.

In the same vein, in Culture and Socialism, Trotsky evokes what could be called "socialist alchemy": "Psychoanalysis and experimental psychology will reveal the springs of human behavior. Man will make himself the object of the most complicated methods of artificial selection and psycho-physical training."

These passages are obviously problematic from our current perspective. They show to what extent the founder of the Fourth International was marked by the scientism of his era and how far he was from an ecological consciousness that necessarily implies respect for natural processes and human diversity.

A Harmonious Development of All Human Faculties

It is interesting to compare these positions with those of Bukharin, who is generally considered much more to the right than Trotsky. In his Historical Materialism (1921), the future theorist of the "enrichment of the kulaks" writes: "Society and its environment form a system in a state of (moving) equilibrium. Changes in this environment provoke changes in society, and vice versa. We thus have mutual action of society and environment." [18]

This formulation, which today would be called "ecosystemic," is much more dialectical than Trotsky's mechanical visions. Bukharin goes further: he evokes the necessity of a "rational regulation of the exchange of matter between society and nature." This is a direct reference to the Marxian concept of social metabolism, which Marx had developed notably in Capital.

It should be noted that Bukharin was not alone among the Bolshevik leaders in showing some ecological consciousness. Kautsky, before his break with revolutionary Marxism, had already addressed these questions in The Agrarian Question (1899) [19]. But among the great figures of October 1917, Trotsky seems to be the one who remained most foreign to these preoccupations.

Certainly, the historical context explains much. The Soviet Union was an economically backward country, encircled by imperialism, and the imperatives of industrial development and defense were pressing. As early as April 1923, in the Theses on Industry that he presented to the 12th Congress of the Communist Party, Trotsky explained that this was a question of life or death for the regime [20].

The facts have shown that this last analysis was fundamentally correct. Given the enormity of what was at stake and the increasingly brutal methods of the Stalin-Bukharin faction, it is not surprising that Trotsky sometimes "bent the stick in the other direction," according to a famous expression. Let us note, however, in his defense, that in doing so, he was simply faithful to the technicist and modernist culture of the era, which was that of the entire Bolshevik leadership and which found its artistic expression in the futurist current [21].

However, as we have seen, the historical context does not explain everything. On a series of questions such as the domination of nature, the perspectives of transformation that derive from it, absolute scientific truth, the status of technologies, etc., we note that Trotsky is behind in relation to certain clearly more nuanced positions of Marx, Engels, and even Lenin. A very surprising point is that some reasoning about scientific or technical development claims dialectics as a kind of transcendent meta-theory. This conception of dialectics is completely opposed to the one that Trotsky operates when he analyzes social and political phenomena.

On the other hand, very often, the tone of the texts cited in this article leaves an unpleasant impression of dominating arrogance, even contempt, not only for wild nature but also for what is natural, physiological, uncontrolled in human beings. This point is more important than it appears. Indeed, Trotsky's very dominating version of the "domination of nature" and the imperative discourse that flows from it leave no room for the thought of "caring for" what exists, whereas this is indispensable for the development of an ecological consciousness and practice.

By Way of Provisional Conclusion

Leon Trotsky is a great internationalist revolutionary and a brilliant thinker. We owe him notably the analysis of fascism, that of bureaucracy, and the theory of permanent revolution. By founding the Fourth International when it was almost "midnight in the century," he allowed the transfer of the Marxist-revolutionary heritage to subsequent generations. To read Trotsky is to touch with one's fingers the reality of the Russian revolution, of the Communist International, of the revolutionary wave at the end of the First World War and its reflux. It is to understand fascism and Stalinism, the popular front, the Spanish revolution and the Canton commune, the decline of the British empire and the rise of American imperialism. In a word, it is to understand the 20th century and to assimilate programmatic and methodological elements absolutely indispensable for the development of an anti-capitalist orientation in the 21st century.

But every medal has its reverse side. In Trotsky, ecological consciousness is at degree zero. In the legacy that he transmitted to his successors were missing the few brilliantly precursory tools of ecosocialism, such as Marx and Engels had developed them. The ultimate irony: of all the October leaders, the only one who attached some importance to the concept of rational regulation of the social metabolism between humanity and nature was the leader of the right wing, the theorist of the enrichment of the kulaks and of socialism in one country, Stalin's stepping-stone: Bukharin. This is not enough to make him an ecosocialist theorist, far from it (we will return to this),

but it is a fact, and this fact could only contribute to explaining that the revolutionary Marxists of the post-war period lost the thread of "Marx's ecology."

Postscript (2025)

This critique of Trotsky's ecological limitations should not be mistaken for a rejection of his revolutionary legacy. On the contrary, it is precisely because Trotsky's contributions to Marxist theory and practice remain indispensable that we must confront his blind spots honestly. The very deep and dangerous perturbation of the metabolism between society and the rest of nature—manifest not only in climate disruption but in biodiversity collapse, soil degradation, ocean acidification, chemical pollution, and the wholesale disruption of planetary cycles—demands that twenty-first century revolutionaries integrate ecological consciousness into our strategic thinking from the outset, rather than treating it as an afterthought to be addressed "after the revolution."

The irony is striking: Trotsky, the theorist of permanent revolution who understood that socialism could not be built in isolation from international struggle, failed to grasp that socialism also cannot be built in isolation from the rational regulation of social metabolism that Marx identified as essential to human freedom. Today's ecosocialists must synthesize his insights about uneven and combined development with an understanding of the material interdependence between human society and natural systems—recognizing that the revolution must be simultaneously international and ecological, or it will be neither.

Revolutionary organizations worldwide now have access to both Marx's ecological insights and 150 years of additional evidence about capitalism's systematically destructive relationship with the biosphere. We have no excuse for reproducing Trotsky's technological fetishism or his domineering vision of humanity's relationship with nature. The task before us is to build a revolutionary movement that is as uncompromising in its opposition to the metabolic rift as it is to capitalist exploitation—understanding these as two faces of the same system that must be overthrown root and branch.

Source: Red Mole 13 August 2025

[1] Fourth International, Ecology and Socialism, http://www.europe-solidaire.org/spip.php?article7892.

[2] Fourth International, Resolution: Climate Tipping Point and Our Tasks, http://www.europe-solidaire.org/spip.php?article16635.

[3] F. Engels, The Dialectics of Nature, Paris, Editions Sociales, 1968, pp. 180-181.

[4] Leon Trotsky, Literature and Revolution.

[5] Leon Trotsky, Culture and Socialism, 1927 (our translation).

[6] Karl MARX, Letter to Engels of July 7, 1866.

[7] . F. Engels, Anti-Dühring, pp.136-137.

[8] Lenin, Materialism and Empirio-criticism, p. 147.

[9] L. Trotsky, Mendeleev and Marxism, speech at the Mendeleev Congress, September 17, 1925, Marxists Internet Archive.

[10] Marx, Capital, I, Chap XXVIII, Garnier Flammarion 1969 p.546 — our emphasis.

[11] L. Trotsky, Culture and Socialism, op. cit. Marxists Internet Archive (our emphasis).

[12] In the key domain of energy, for example, from the second half of the 19th century, some engineers advocated that the sun replace coal as a source. These were not just ideas in the air: efficient solar machines were effectively developed in a whole series of application domains. If this energy sector had taken off, it would have changed the face of the world. But it did not take off at all, not for technical reasons, and not even always for efficiency-cost reasons, but mainly because the coal monopolies already had the power to lock up innovation, in order to maintain their super-profits (cf. D. Tanuro, The Impossible Green Capitalism).

[13] Marx, Engels, The German Ideology, Marxists Internet Archive.

[14] L. Trotsky, Culture and socialism, op. cit.

[15] L. Trotsky, If America Should Go Communist, Marxists Internet Archive (our translation).

[16] L. Trotsky, Radio, science, technique and society, 1926 Marxists Internet Archive (our translation).

[17] Lenin, The Agrarian Question and the Critics of Marx, chapter IV, Marxists Internet Archive.

[18] Bukharin, The Theory of Historical Materialism. A Manual of Marxist Sociology, ed. Anthropos, Paris, 1967.

[19] Kautsky, The Agrarian Question, facsimile reprint Maspéro, Paris 1970.

[20] L. Trotsky, Theses on Industry, Marxists Internet Archive.

[21] It is striking that most of Trotsky's texts where he expresses himself on nature have culture as their main theme. Indeed, but this exceeds both the limits of this article and the competencies of its author, his way of apprehending nature is very closely linked to his conceptions of art. This appears notably in his lyrical evocation of the Shatura thermal power plant as an object of art (a thing of beauty).