

Marx and the Global Environmental Rift

Saturday 15 December 2007, by [FOSTER John Bellamy](#) (Date first published: 28 November 2007).

Ecology is often seen as a recent invention. But the idea that capitalism degrades the environment in a way that disproportionately affects the poor and the colonized was already expressed in the nineteenth century in the work of Karl Marx and Frederick Engels. Writing in *Capital* in 1867 on England's ecological imperialism toward Ireland, Marx stated: "For a century and a half England has indirectly exported the soil of Ireland, without even allowing its cultivators the means for replacing the constituents of the exhausted soil." Marx was drawing here on the work of the German chemist Justus von Liebig. In the introduction to the seventh (1862) edition of his *Organic Chemistry in Its Applications to Agriculture and Physiology* Liebig had argued that "Great Britain robs all countries of the conditions of their fertility" and singled out Britain's systematic robbing of Ireland's soil as a prime example. For Liebig a system of production that took more from nature than it put back could be referred to as a "robbery system," a term that he used to describe industrialized capitalist agriculture. [1]

Following Liebig and other analysts of the nineteenth-century soil crisis, Marx argued that soil nutrients (nitrogen, phosphorus, and potassium) were sent in the form of food and fiber sometimes hundreds and thousands of miles to the cities, where, instead of being recycled back to the land, these nutrients ended up polluting the urban centers, with disastrous results for human health. Meanwhile, faced with an increasingly impoverished soil, Britain, as Liebig pointed out, imported bones from Napoleonic battlefields and from Roman catacombs together with guano from Peru in a desperate attempt to restore nutrients to the fields. (Later on the invention of synthetic fertilizers was to help close the nutrient gap, but this was to lead to additional environmental problems, such as nitrogen runoff.)

In addressing these environmental issues Marx took over the concept of *Stoffwechsel* or metabolism from Liebig, [2] describing the ecological contradiction between nature and capitalist society as "an irreparable rift in the interdependent process of social metabolism." Indeed, "capitalist production," Marx explained, "only develops the techniques and the degree of combination of the social process of production by simultaneously undermining the original sources of all wealth — the soil and the worker." This rift in the metabolic relation between humanity and nature could only be overcome, he argued, through the systematic "restoration" of the metabolism between humanity and nature "as a regulative law of social organization." But this required the rational regulation of the labor process (itself defined as the metabolic relation of human beings to nature) by the associated producers in line with the needs of future generations. "Even an entire society, a nation, or all simultaneously existing societies taken together," Marx stated, "are not owners of the earth. They are simply its possessors, its beneficiaries, and have to bequeath it in an improved state to succeeding generations as *boni patres familias* [good heads of the household]." [3]

Marx's ecological discussions, coupled with those of Engels, therefore went well beyond the general understanding of his time. Today the ecological issues that Marx and Engels addressed (albeit sometimes only in passing) read like a litany of many of our most pressing environmental problems: the division of town and country, the degradation of the soil, rural isolation and desolation, overcrowding in cities, urban wastes, industrial pollution, waste recycling in industry, the decline in nutrition and health, the crippling of workers, the squandering of natural resources (including fossil fuel in the form of coal), deforestation, floods, desertification, water shortages, regional climate

change, conservation of energy, the dependence of species on changing environments, historically-conditioned overpopulation tendencies, and famine.

Marx saw the materialist conception of history as related to the materialist conception of nature, the science of history as related to the science of nature. He filled his natural science notebooks with studies of geology, chemistry, agronomy, physics, biology, anthropology, and mathematics. He attended the lectures at the Royal Institution in London of the Irish-born physicist John Tyndall. Marx was fascinated by Tyndall's experiments on radiant heat, including the differentiation of the sun's rays. [4] It is even possible that he was in the audience in the early 1860s when Tyndall presented results of his experiments demonstrating for the first time that water vapor and carbon dioxide were associated with a greenhouse effect that helped to retain heat within the planet's atmosphere. (No one at that time of course suspected that the greenhouse effect interacting with carbon dioxide from the human burning of fossil fuels might lead to human-generated global climate change — a hypothesis not introduced until 1896 by the Swedish scientist Svante Arrhenius.)

Today the dialectical understanding with regard to nature-society interactions that Marx and Engels embraced is increasingly forced on us all, as a result of an accelerating global ecological crisis, symbolized above all by global warming. Recent research in environmental sociology has applied Marx's theory of metabolic rift to contemporary ecological problems such as the fertilizer treadmill, the dying oceans, and climate change. Writing on the social causes of the contemporary "carbon rift," stemming from the rapid burning up of fossil fuels, Brett Clark and Richard York have demonstrated that there is no magic cure for this problem outside of changes in fundamental social relations. Technology is unlikely to alleviate the problem substantially since gains in efficiency, according to what is known as the "Jevons Paradox" (named after William Stanley Jevons who wrote *The Coal Question* in 1865), lead invariably under capitalism to the expansion of production, the accompanying increases in the throughput of natural resources and energy, and more strains on the biosphere. "Technological development," Clark and York therefore conclude, "cannot assist in mending the carbon rift until it is freed from the dictates of capital relations." [5]

The only genuine, i.e. sustainable, solution to the global environmental rift requires, in Marx's words, a society of "associated producers" who can "govern the human metabolism with nature in a rational way, bringing it under their collective control instead of being dominated by it as a blind power; accomplishing it with the least expenditure of energy and in conditions most worthy and appropriate for their human nature." [6] The goals of human freedom and ecological sustainability are thus inseparable and necessitate for their advancement the building of a socialism for the 21st century.

P.S.

* From Monthly Review, MRzine.:

<http://mrzine.monthlyreview.org/foster281107.html>

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Footnotes

[1] Karl Marx, *Capital*, vol. 1 (New York: Vintage, 1976), 860; John Bellamy Foster, *Marx's Ecology* (New York: Monthly Review Press, 2000), 164. See also Erland Måråld, "Everything Circulates: Agricultural Chemistry and Recycling Theories in the Second Half of the Nineteenth

Century," *Environment and History*, vol. 8 (2002), 65-84.

[2] As indicated in the editor's notes to the Penguin/Vintage edition of *Capital*, vol. 3: "Liebig is referred to several times in both this volume and Volume 1, and it seems that Marx took from Liebig the concept of metabolism (Stoffwechsel) that he applied there, suitably transformed, to the analysis of the labour process (Chapter 7)." In Karl Marx, *Capital*, vol. 3 (New York: Vintage, 1981), p. 878.

[3] Foster, *Marx's Ecology*, 155-70. See also Paul Burkett, *Marx and Nature* (New York: St. Martin's Press, 1999); Paul Burkett and John Bellamy Foster, "Metabolism, Energy, and Entropy in Marx's Critique of Political Economy," *Theory & Society*, vol. 35 (2006), 109-56.

[4] Spencer R. Weart, *The Discovery of Global Warming* (Cambridge, Massachusetts: Harvard University Press, 2003), pp. 3-4; Y. M. Uranovsky, "Marxism and Natural Science," in Nikolai Bukharin, et. al., *Marxism and Modern Thought* (New York: Harcourt, Brace, and Co., 1935), p. 140. In 1865 Engels reported that a chemist that he had just met — probably Carl Schorlemmer, who was to become one Engels and Marx's closest friends, a Fellow of the Royal Society and the first individual in England to occupy a chair in organic chemistry — had explained to him Tyndall's "sunbeam experiment." See W. O. Henderson, *The Life of Friedrich Engels* (London: Frank Cass, 1976), vol. 1, p. 262.

[5] Brett Clark and Richard York, "Carbon Metabolism: Global Capitalism, Climate Change, and the Biospheric Rift," *Theory & Society*, vol. 34 (2005), p. 419. For further work on the metabolic rift and global ecological crisis see Rebecca Clausen and Brett Clark, "The Metabolic Rift and Marine Ecology," *Organization & Environment*, vol. 18, no. 4 (2005), pp. 422-44; Philip Mancus, "Nitrogen Fertilizer Dependency and Its Contradictions," *Rural Sociology*, vol. 72, no. 2 (June 2007).

[6] Marx, *Capital*, vol. 3, p. 959.