

The Epochal Crisis :: Monthly Review

John Bellamy Foster more on Economics , Environment/Science , Global Economic Crisis

Parts of the argument on epochal crisis here were presented in three overlapping keynote addresses in: (1) Esslingen, Germany on May 30, 2013 at a conference on Marxist thought organized by the Berlin Institute of Critical Theory (InkriT) and the *Historisch-Kritisches Wörterbuch Des Marximus*; (2) New York City on June 9, 2013, at the Closing Plenary of the Left Forum; and (3) Dublin on June 27, 2013, at the annual conference of the International Association for Media and Communication Research. The argument has been revised and updated based on the original notes for these talks.

It is an indication of the sheer enormity of the historical challenge confronting humanity in our time that the worst economic crisis since the Great Depression, sometimes now called the Second Great Depression, is overshadowed by the larger threat of planetary catastrophe, raising the question of the long-term survival of innumerable species—including our own.¹ An urgent necessity for the world today is therefore to develop an understanding of the interconnections between the deepening impasse of the capitalist economy and the rapidly accelerating ecological threat—itself a by-product of capitalist development.

I shall use the term “epochal crisis” here to refer to the convergence of economic and ecological contradictions in such a way that the material conditions of society as a whole are undermined, posing the question of a historical transition to a new mode of production. This can be distinguished from the ordinary developmental crises that punctuate the history of capitalism. Such an epochal crisis, as Jason Moore has argued, characterized the transition from feudalism to capitalism from the late medieval period to the seventeenth century—a crisis of an entire historical epoch that was equally ecological, economic, and social in its manifestations, stretching from recurrent famine, the Black Death, and soil exhaustion to peasant revolts and the escalation of warfare.² An even more momentous epochal crisis than the one that produced the transition from feudalism to capitalism, I will argue, is occurring today, arising from the unlimited expansion of a capitalist system geared to a process of abstract wealth creation.

Contrary to economic myth, the system of capitalist production and exchange does not take the form of simple commodity production, or the circuit C-M-C, in which a commodity (C), representing a definite, qualitative use value is exchanged for money (M), which is then exchanged for a another commodity (C), representing a different use value—to be simply consumed in the end. Rather, in line with what Marx termed the “general formula of capital,” or M-C-M', money (M) is exchanged for labor power and commodities with which to produce a new commodity (C), to be sold for more money ($M' = M + \Delta m$ or surplus value). Hence, it is not *use value*, fulfilling concrete, qualitative needs, that constitutes the aim of capitalist production, but rather *exchange value*, generating profit for the capitalist. The abstract, purely quantitative nature of this process, moreover, means that there is no end to the incentive of seeking more money or surplus value, since M' leads in the next circuit of production to a drive to obtain M'' , followed by the drive to obtain M''' in the circuit after that, in an unending sequence of accumulation and expansion.

Characteristic of monopoly capitalism is a further warping of this process through the displacement of natural-material use value by *specifically capitalist use value*—the only real “use” of which is to enhance exchange value for the capitalist. Thus wasteful and destructive commodities increasingly dominate production, from military hardware to superficial car model-changes, to excessive packaging. Here Marx’s general formula for capital, as it pertains to production itself, has metamorphosed into M-CK-M', where CK stands for specifically capitalist use value.³

At the more stratospheric level represented by contemporary finance, the general formula for capital, or M-C-M', is being increasingly supplanted by the circuit of speculative capital, M-M', in which the production of use values disappears altogether and money simply begets more money.⁴ What economists call “the real economy” or the realm of commodity production associated with GDP is thus being subordinated in the irrational logic of today’s phase of monopoly-finance capital to a process of wealth generation organized around financial-asset appreciation and dependent on an unending series of financial bubbles. Financial capital more and more rules the roost, largely disconnected from the real economy of commodity production and use value.

Behind the worldwide veil of capitalist value relations, hundreds of millions, even billions, of people are poor and destitute, often lacking the most basic prerequisites of material existence—adequate food, water, clothing, housing, employment, healthcare, and a non-toxic environment—due to the failures and contradictions of accumulation. Meanwhile, what ecologists call “real wealth,” i.e., the product of nature itself, is being extracted from the environment on an ever-increasing scale devoid of any concern for either the rationality of production or the sustainability of natural systems, thereby robbing both present and future generations. Since unequal exchange relations with respect to both nature and labor prevail within the international economy this robbery falls disproportionately on poorer nations, a portion of whose natural use values (and economic surplus) is systematically siphoned off to enrich nations at the apex of the global imperialist pyramid.⁵

Everywhere the narrow rationality of monopoly-finance capital is coming into conflict with real-material relations, undermining real production and real wealth—indeed the entire realm of use value, human well being, and life itself—generating a growing socio-ecological malaise that is spreading in all directions at once. “Capitalist economic rationality,” Samir Amin writes in his *Three Essays on Marx’s Value Theory* (2013), has been transformed in the twenty-first century into “social irrationality on the scale of the human race” and the earth as a whole.⁶ To understand the full significance of this it is essential to explore in much greater detail both the economic and ecological dimensions of capitalism’s epochal crisis.

The Economic Dimensions

The economic dimensions of the epochal crisis can be described in terms of three mutually reinforcing trends: monopolization, stagnation, and financialization—combined, at the world level, with the global labor arbitrage. The late nineteenth century and the beginning of the twentieth century saw the emergence of the monopoly stage of capitalism, arising out of the concentration and centralization of capital. The typical firm is now a quasi-monopoly or oligopoly with considerable monopoly power with respect to price, output, and investment. Industries within the manufacturing sector of the economy are highly concentrated, dominated by a few giant firms benefitting from substantial monopoly rents. The same is true in the sphere of finance where the big four U.S. banks own almost half the country’s total banking assets. In 2007, at the outset of the Great Financial Crisis, the 200 largest U.S. corporations accounted for over 30 percent of all gross profits in the economy (up from 13 percent in 1950), while the world’s 500 largest firms were taking in about 35–40 percent of all global revenue (up from less than 20 percent in 1960). What is often described as increasing international competition is in reality the intensified global rivalry of monopolistic firms engaged in a mixture of price collusion and various forms of non-price competition.⁷

These giant, globe-straddling corporations enjoy widening profit margins, generating increasing problems of inequality and surplus capital absorption, and slowing down the overall rate of accumulation, particularly at the core of the capitalist world economy. Stagnation rather than rapid growth is therefore the *normal* state of the monopoly capitalist economy, partially counteracted at times by specific historical factors (such as wars, epoch-making innovations, the sales effort, and financialization).⁸

What Paul Sweezy referred to as “the financialization of the capital accumulation process” has been the main means in which monopoly capital in recent decades has adapted to this deepening economic stagnation.⁹ Faced with the difficulty of profitably absorbing the enormous potential economic surplus at their disposal, big corporations and wealthy investors increasingly poured their surplus capital into the financial sphere in order to secure high speculative returns. Financial institutions responded to this additional demand for their products by supplying an endless array of new, exotic speculative opportunities (junk bonds, derivatives, options, hedge funds, etc.) leading to an explosion of credit/debt. Even commodity producing corporations such as General Electric and General Motors set up financial divisions to try to capture some of the profits to be made in finance. The result was a series of financial bubbles lifting the economy but at the cost of the greater fragility of the entire system. Eventually, this new financial superstructure took on a life of its own, dominating over production, with decision-making migrating more and more from corporate boardrooms to financial markets.¹⁰

The whole logic of the system under the current phase of monopoly-finance capital is therefore one in which the accumulation of capital in the traditional sense, i.e., centered on real capital formation, is being subordinated to an increasingly abstract process of wealth generation through the promotion of financial-asset appreciation. $M-C-M'$ has given way to $M-M'$ —a possibility that Marx raised and Keynes feared.¹¹

At the international level the system is governed by the global labor arbitrage, whereby giant, multinational firms seek out the lowest unit labor costs worldwide, shifting the greater part of industrial production to export zones in the global South and spurring the growth of a handful of export-dependent emerging economies. Imperialist relations are intensified worldwide through an accelerated process of unequal economic exchange (where the difference in the wages is greater than the difference in the productivities) and a general system of imperial rent.¹² Not surprisingly under these conditions, the average annual per capita GDP of developing countries (excluding China) was a mere 6.1 percent of that of the G7 countries (the United States, Japan, Germany, France, the United Kingdom, Italy, and Canada) in 1970–1989, dropping to 5.6 percent in 1990–2006 (just prior to the Great Financial Crisis).¹³

The Ecological Dimensions

The ecological dimensions of the epochal crisis are best understood in terms of Marx’s analysis of the metabolism of nature and society—extended to take into account the relations of monopoly capitalism.¹⁴ In Marx’s conception, production existed as a social process within “the universal metabolism of nature.” Material use values were appropriated from “the natural world” and transformed by production into social use values to fit “human needs.” This constituted “the universal condition for the metabolic interaction between nature and man, and as such is a natural condition of human life.”

Marx viewed what he called “extractive industry”—“the fish caught in water...or the wood felled in the primeval forest, or the ore brought up out of the pit”—in terms of natural use values (real wealth) provided by nature independent of human labor. He wrote in *Capital*: “The earth, on the one hand, labour on the other...are material elements of any process of production,” related to the universal metabolic process of nature, and thus not reducible to “social forms.”¹⁵ This conception of elemental natural conditions to which society must conform led him to develop his critique of the “irreparable rift in the interdependent process of social metabolism” associated with capitalism’s transgression of “the natural laws of life itself.”¹⁶ So universal was this rift in the metabolism between nature and society under industrial capitalism—reflected in the robbing of the soil of its nutrients shipped to the city in the form of food and fiber with the resulting pollution of urban centers—that it extended to international trade, with some countries in effect robbing others of their soil within a general process of ecological imperialism.¹⁷

How is this analysis of the metabolism of nature and society developed by Marx to be applied to today's epochal crisis? There is now an extensive body of work utilizing Marx's concept of metabolic rift to analyze today's ecological problems.¹⁸ However, the other, more commodity-related, part of the analysis of the nature-society metabolism, concerned specifically with the role of use-value production, has barely been addressed in an ecological context. A crucial question is how the changing use-value structure of the economy has contributed to planetary ecological degradation. Marx himself provided us with few direct clues in this area. Although he pointed to the existence of specifically capitalist use values (such as the lock designed by the locksmith who thus benefitted from the criminality promoted by the system) as well as to what he referred to as "use values" that occupy "a higher rank in the system of needs" (hence a hierarchy of social needs), he did not systematically analyze such phenomena related to the historical development of use values, since they were relatively unimportant in the competitive capitalism of his day.¹⁹

The answer to the question of the ecological implications of the changing use-value structure of the capitalist economy must therefore be sought in the historical shift from competitive to monopoly capitalism—extending beyond Marx's time. Thorstein Veblen provided the main outlines of such an analysis at the outset of the twentieth century in his 1923 book, *Absentee Ownership and Business Enterprise in Recent Times*. Veblen argued that the production of waste—which he had defined in *The Theory of the Leisure Class* as expenditure that "does not serve human life or human-well being as a whole"—had become integral to the new corporate economy as a means of enhancing sales and profits in face of limited demand. Such unproductive expenditures had penetrated so deeply into the entire structure of production, he suggested, that "the distinction between workmanship and salesmanship has progressively been blurred...until it will doubtless hold true now that the shop-cost of many articles produced for the market is mainly chargeable to the production of saleable appearances, ordinarily meretricious."²⁰

Paul Baran and Paul Sweezy expanded upon this argument in 1966 in *Monopoly Capital*. Building on both Marx and Veblen, they dealt extensively with the growth of economic waste as a means of surplus absorption—in such varied forms as military spending, the sales effort, and FIRE (finance, insurance, and real estate). The sales effort, they insisted, had grown so prodigiously under monopoly capitalism that the use-value structure of the economy could no longer be viewed as a rational expression of production costs. What they called "the interpenetration effect" thus stood for this intermixing of sales costs and production costs with the result that an ever-larger proportion of what were considered costs of production were in fact forms of waste imposed by the system, i.e., specifically capitalist use values (CK). Product obsolescence was intentionally built into consumer durables, while consumer goods were structurally designed overall at enormous expense to promote extreme, acquisitive forms of buying behavior. With waste associated with marketing penetrating into the deep structure of production under the regime of the giant corporation, the buyer had no choice but to pay for such unproductive costs—included in the price of even the most necessary wage goods as a condition of their availability. All of this was deemed "rational" and "efficient" by a monopoly-capitalist economy continually beset by problems of saturated markets, slow growth, and unemployment/underemployment.²¹

The essential problem, then, in the critique of monopoly capitalism, as Baran explained in a letter to Sweezy on December 19, 1961, was to account for the economic “*output imputable to misused input*—and by ‘misused’ I mean here exploited in the Marxian sense, wasted in our sense [i.e., “not conducive to and not required for the health, happiness and development of man”], unemployed in the Keynesian sense.” Viewed “critically and negatively,” this meant: “*no* air conditioned nightmares like Chase Manhattan buildings, *no* motorized monsters to the tune of 60 million, *no* rape of the country by superhighways and billboards.” There was no feasible way, of course, of calculating all of the misused input and the resulting economic (and ecological) waste. But the enormity, even predominance, of this general phenomenon was not to be denied. The sheer magnitude of such unproductive expenditures stood in a negative way for the potential of a more rational, more sustainable society to satisfy real human needs. What Peter Custers, building on Baran and Sweezy’s *Monopoly Capital* in his *Questioning Globalized Militarism* (2006), has termed “negative use values” are clearly visible today in the U.S. trillion-dollar-a-year war machine, but also in the products—all too often toxic—that are the basis of everyday consumption.²²

All of this relates to what Juliet Schor has called “the materiality paradox.”²³ This is the notion that what we produce and what we consume is, at present, determined less by the product’s material use value than by the symbolic worth that is placed on it in terms of social status and the fulfillment of psychological needs—as inculcated by modern marketing. From this standpoint, as Raymond Williams declared, the problem is not that we are “too materialist” but that we are “not materialist enough.” A high-consumption, throwaway society in which the world of commodities has been transformed by advertising into a “magic kingdom” devoted to the pursuit of symbolic needs will inevitably be destructive of its environmental surroundings.²⁴

The wider ecological irrationality of modern production includes the extraordinary misuse of natural inputs, notably energy resources. As Barry Commoner argued in 1976, in a talk entitled “Oil, Energy, and Capitalism,” the “social use values” of the modern capitalist economy were produced in an energy-intensive and thermodynamically inefficient manner, merely in order to save on labor cost—since capitalism, as Marx had rightly pointed out, was geared to the displacement of labor in order to hold down wages. For example, handbags, Commoner explained, were increasingly made out of plastic instead of leather, despite the far greater energy input required in the case of the former, merely because this served to reduce labor cost (due to the substitution of fossil-fuel energy for labor input), providing wider profit margins. The socially irrational nature of this structure of production was evident in the generation of a larger reserve army of the unemployed side-by-side with enormously enhanced ecological degradation.²⁵

From a global perspective it is important to recognize that the periphery of the world capitalist system is subject to most (if not all) of the economic and ecological contradictions of monopoly capitalism described above, while also being subject to those specific inequities imposed by imperialism. The pillage of the global South has never depended simply on unequal economic exchange but has also relied throughout on unequal ecological exchange. Here it is significant that Howard T. Odum, one of the foremost systems ecologists of the twentieth century, was also the leading analyst of the process of unequal ecological exchange. Crucial to Odum’s approach, which was derived partly from Marx, was the conception of what he called “real wealth” in the form of embodied energy (emergy) incorporated in a natural or social product.²⁶ On this basis Odum was able to demonstrate that exchanges of goods produced in the periphery of the world economy typically encompassed more embodied energy taken from the free environment (outside of monetary relations) than the goods of countries producing in the center of the world economy, creating a net loss of embodied energy or real wealth for the peripheral countries in any international market exchange of goods.

“Free trade,” Odum wrote, “is an ideal based on the assumption of equitable exchange.... But free trade made developed countries rich, with high standards of living, leaving less developed countries devastated.” The underlying reason for this is that goods produced in the periphery generally contained more “free gifts” of nature (not included in the labor-based value accounting of the capitalist economy) than was the case for goods produced in center countries. For example, Odum calculated that in the 1980s and ‘90s Ecuador was exporting as much as ten times more embodied energy than it was importing through the normal mechanism of “free trade.” In contrast the United States under the same system of free trade exported only half as much embodied energy as it imported (and countries such as the Netherlands, Germany, and Japan only a quarter as much). Trade between the global North and the global South, he argued, thus took the form of “imperial capitalism,” in which rich nations gained at the expense of poor.²⁷ This inequality is further exacerbated by the migration of polluting industries from the global North to the global South—so as to concentrate the toxic effects of production in the latter and the benefits, in the form of economic surplus monopolized by multinational corporations, in the former.

An Epochal Revolution

In the foregoing analysis I have argued that the epochal crisis of our time emanates from a dangerous and disruptive intersection of economic and ecological contradictions traceable to the growing distortion, displacement, and degradation of natural-material use values. This is tied not only to the accumulation process directly, but also to the acceleration of environmental throughput that it entails, and the accompanying rift in the biogeochemical processes of the planet.

In Marx’s hopeful vision, “mankind...inevitably sets itself only such tasks as it is able to solve, since closer examination will always show that the problem itself arises only when the material conditions for its solution are already present or at least in the course of formation.” Today the material potential exists—both economically and ecologically—to overcome the epochal crisis of our times. This potential is manifested in the exploitation, waste, idle capacity, displacement of use values, and rapacious destruction of real wealth that characterizes the present system. The gigantic misuse of human and natural resources that constitutes the modern capitalist economy means that we already have the potential many times over to redirect production and consumption to meet human needs and to practice conservation on a global level, creating a society of ecological sustainability and substantive equality.

Accomplishing this though means breaking with capitalism’s expansionist drive, which is now destroying the earth as a “safe operating space for humanity,” through the crossing of critical planetary boundaries. This is manifested in such planetary rifts as: climate change, ocean acidification, destruction of the ozone layer, species extinction, the disruption of the nitrogen and phosphorus cycles, loss of freshwater, loss of land cover, aerosol loading, and chemical pollution.²⁸

For capitalism time is money and the future of humanity and the earth is therefore systematically discounted within the cash nexus. Monopoly capital alters the use-value structure of the economy itself, generating specifically capitalist use values that are frequently negative in character, in order to accelerate commodity circulation, the level of environmental throughput, and overall production—with the sole object of generating more wealth for the wealthy in the present.²⁹ *Après moi, le déluge!* is thus the spirit of capitalism, particularly in its present phase of monopoly-finance capital.³⁰ It follows that the current epochal crisis requires a no less epochal transition from one mode of production to another, reminiscent of the transition from feudalism to capitalism, but on a far bigger scale. Indeed, what is needed, to quote István Mészáros, is the kind of “global epochal...structural change advocated by Marx.”³¹

How will the necessary revolutionary transition come about? I am convinced that objective forces today are progressively erasing previous distinctions between workplace exploitation and environmental degradation—as capitalism universally undermines all real-material conditions of production. This dramatic change is occurring more rapidly in the global South than the global North. As a result we are seeing in places as diverse as China, India, Egypt, Turkey, South Africa, Brazil, Bolivia, Ecuador, and even parts of North America (for example in the larger movement growing up around Canada’s indigenous-led Idle No More) the emergence of what could be called an “environmental working class” arising out of wider alliances of oppressed groups around degraded material conditions. This broadening of working-class struggles into environmental struggles and the forging of diverse community alliances should not surprise us, since the early struggles of the working class in Europe were directed as much at the toxicity of the industrial centers in which workers were compelled to live as at the exploitation within the factories.³² The extensive privatization engineered by what Naomi Klein has aptly designated as “disaster capitalism” is producing in response a new ecological sociability, embracing a vision of human production in its most fundamental sense as the metabolism of nature and society.³³

Central to the epochal crisis, as we have seen, is the misuse of natural-material use values, both within production narrowly conceived, and also within what Marx called “the metabolic interaction of nature and society,” or human production in its widest, most dialectical sense. All material relations, whether economic, cultural-communal, or environmental, are affected. We are therefore approaching a historical moment—a product of the vast creative destructiveness of capitalism in our age—when these various material conditions will no longer be as disconnected as they have been for most of the past century. Although all sorts of conflicts remain within working communities around labor, environmental, and cultural issues—with the powers that be doing their best to disunite workers in line with the age-old principle of divide and conquer—the objective conditions are nonetheless emerging that are creating the potential for a larger material alliance against the system. This will likely take the form of a co-revolutionary struggle, in the sense suggested by David Harvey, embodying an alliance of gender, race, class, indigenous, and environmental movements.³⁴

All of this depends of course on the rise to prominence of an environmental working class (and ecological peasantry) capable of initiating a broad, counter-hegemonic struggle for the fulfillment of human needs in line with the fundamental biogeochemical processes of the planet—a world of substantive equality and ecological sustainability. There is no doubt that this is an objective necessity and that it will increasingly become a subjective one as well. Yet, there is no certainty as to the future of humanity. The very continuation of the human species along with most of the other “higher” forms of life is now in doubt. The future and even survival of humanity thus rests as never before on the revolutionary struggle of humanity itself.

Notes

1. ↪ J. Bradford DeLong, “[The Second Great Depression](#),” *Foreign Affairs*, July-August 2013, <http://foreignaffairs.com>.
2. ↪ Jason W. Moore, “Transforming the Metabolic Rift: A Theory of Crises in the Capitalist World Ecology,” *Journal of Peasant Studies* 38, no. 1 (2011): 11. See also Jason W. Moore, “The Crisis of Feudalism: An Environmental History,” *Organization and Environment* 15, no. 3 (September 2002): 301–22.
3. ↪ See John Bellamy Foster, “[The Ecology of Marxian Political Economy](#),” *Monthly Review* 63, no. 4 (September 2011): 12.
4. ↪ Karl Marx, *Capital*, vol. 1 (London: Penguin, 1976), 247–57. The “total movement” of capital, implicit in the general formula, is that of M-C...P...C’-M’, showing the transformation that takes place in the commodity as a result of production. See Karl Marx, *Capital*, vol. 2 (London: Penguin, 1978), 131–32. On interest-bearing or speculative capital see Karl Marx, *Capital*, vol. 3 (London: Penguin, 1981), 515–24.
5. ↪ See Howard T. Odum, *Environment, Power, and Society for the Twenty-First Century* (New York: Columbia University Press, 2007), 273–78; John Bellamy Foster and Hannah Holleman, “The Theory of Unequal Ecological Exchange: A Marx-Odum Dialectic,” forthcoming, *Journal of Peasant Studies* (2014).

6. ↪ Samir Amin, *Three Essays on Marx's Value Theory* (New York: Monthly Review Press, 2013), 55.
7. ↪ John Bellamy Foster and Robert W. McChesney, *The Endless Crisis* (New York: Monthly Review Press, 2012), 67–72; Robert W. McChesney, *Digital Disconnect* (New York: The New Press, 2013), 36–41; Joseph E. Stiglitz, *The Price of Inequality* (New York: W.W. Norton, 2012), 39–47.
8. ↪ This central thesis was advanced in Paul A. Baran and Paul M. Sweezy, *Monopoly Capital* (New York: Monthly Review Press, 1966).
9. ↪ Paul M. Sweezy, "[More \(or Less\) on Globalization](#)," *Monthly Review* 49, no. 4 (September 1997): 3.
10. ↪ On the history of financialization see especially Harry Magdoff and Paul M. Sweezy, *Stagnation and the Financial Explosion* (New York: Monthly Review Press, 1987). For an extension of the analysis over the years 2006–2008 see John Bellamy Foster and Fred Magdoff, *The Great Financial Crisis* (New York: Monthly Review Press, 2009).
11. ↪ Foster and McChesney, *The Endless Crisis*, 51–55; John Maynard Keynes, *The General Theory of Employment, Interest, and Money* (London: Macmillan, 1973), 159; Jan Toporowski, *Why the World Economy Needs a Financial Crash and Other Critical Essays* (London: Anthem Press, 2010). Keynes himself made use of Marx's M-C-M' in developing his ideas that led to the *General Theory*. See John Maynard Keynes, *Collected Writings*, vol. 29 (London: Macmillan, 1979), 81–82.
12. ↪ See Foster and McChesney, *The Endless Crisis*, 125–54; Amin, *Three Essays on Marx's Value Theory*, 79–90; Samir Amin, *The Law of Worldwide Value* (New York: Monthly Review Press, 2010).
13. ↪ For a more complete discussion and data sources see Fred Magdoff and John Bellamy Foster, *What Every Environmentalist Needs to Know About Capitalism* (New York: Monthly Review Press, 2011), 64–65, 168.
14. ↪ See John Bellamy Foster, *Marx's Ecology* (New York: Monthly Review Press, 2000), 141–77.
15. ↪ Marx and Engels, *Collected Works*, vol. 30 (New York: International Publishers, 1975), 56, 62–65; Marx, *Capital*, vol. 3, 754, 955.
16. ↪ Marx, *Capital*, vol. 3, 949.
17. ↪ Marx, *Capital*, vol. 1, 860.
18. ↪ See John Bellamy Foster, Brett Clark, and Richard York, *The Ecological Rift* (New York: Monthly Review Press, 2010); Rebecca Clausen and Brett Clark, "The Metabolic Rift and Marine Ecology: An Analysis of the Ocean Crisis Within Capitalist Production," *Organization & Environment* 18, no. 4 (2005): 422–44; Ryan Gunderson, "The Metabolic Rifts of Livestock Agribusiness," *Organization and Environment* 24, no. 4 (2011): 404–22; Stefano Longo, "Mediterranean Rift: Socio-Ecological Transformations in the Sicilian Bluefin Tuna Fishery," *Critical Sociology* 38, no. 3 (2012): 417–36; Matthew Clement, "A Basic Accounting of Variation in Municipal Solid-Waste Generation at the County Level in Texas, 2006: Groundwork for Applying Metabolic-Rift Theory to Waste Generation," *Rural Sociology* 74, no. 3 (2009): 412–29; Philip Mancus, "Nitrogen Fertilizer Dependency and Its Contradictions: A Theoretical Explanation of Socio-Ecological Metabolism," *Rural Sociology* 72, no. 2 (2007): 269–28; Rebecca Clauson, "[Healing the Rift: Metabolic Restoration in Cuban Agriculture](#)," *Monthly Review* 59, no. 1 (2007): 40–52.
19. ↪ Marx and Engels, *Collected Works*, vol. 30, 58; Karl Marx, *Theories of Surplus Value*, part 1 (New York: International Publishers, 1969), 387–88. In the above passage, cited from *The Economic Manuscript of 1861-1863* (in Marx and Engels, *Collected Works*, vol. 30), Marx distinguished between: (a) "higher use values" in the sense of farther down the line in the social transformation of use values, and (b) use values that were "morally" higher up in "the system of needs." According to the first criterion (level of productive transformation of use values) schnapps, he said, was higher than grain, while according to the second criterion (needs) grain was higher.
20. ↪ Thorstein Veblen, *The Theory of the Leisure Class* (New York: New American Library), 78–80; Thorstein

Veblen, *Absentee Ownership and the Case of Business Enterprise in Recent Times* (New York: Augustus M. Kelley, 1964), 300–301.

21. ↪ Baran and Sweezy, *Monopoly Capital*, 112–41; “[Last Letters: Correspondence on ‘Some Theoretical Implications,’](#)” *Monthly Review* 64, no. 3 (July-August 2012): 68, 73; “[Some Theoretical Implications,](#)” *Monthly Review* 64, no. 3 (July-August 2012): 45–58. For a critique of the expansion of marketing under monopoly capitalism see Michael Dawson, *The Consumer Trap* (Urbana: University of Illinois Press, 2003).
22. ↪ Peter Custers, *Questioning Globalized Militarism* (London: Merlin Press, 2006), 11–12, 36–38; John Bellamy Foster, Hannah Holleman, and Robert W. McChesney, “[The U.S. Imperial Triangle and Military Spending,](#)” *Monthly Review* 60, no. 5 (October 2008): 1–19.
23. ↪ Juliet Schor, *True Wealth* (London: Penguin, 2011), 41.
24. ↪ Raymond Williams, *Problems in Materialism and Culture* (London: Verso, 1980), 185.
25. ↪ Barry Commoner, “[Oil, Energy and Capitalism,](#)” a talk at the Community Church of Boston, February 22, 1976, <http://climateandcapitalism.com>. See also Barry Commoner, *The Poverty of Power* (New York: Alfred A. Knopf, 1976), 194–95, 236–37.
26. ↪ Howard T. Odum, “[Interview of Howard T. Odum,](#)” conducted by Cynthia Barnett, August 16, 2001, <http://ufdc.ufl.edu>, 40; Howard T. Odum and Elisabeth C. Odum, *A Prosperous Way Down* (Boulder: University Press of Colorado, 2001), 139; David M. Scienceman, “Emvalue and Lavalue,” paper presented to the annual meeting of the International Society for Systems Sciences, University of Denver, Denver, Colorado, July 12–17, 1992; Foster and Holleman, “The Theory of Unequal Ecological Exchange.” “Embodied energy” is more accurately, referred to in Odum’s system, as “emergy” spelled with an “m,” which emphasizes that it is the historical energy input and not the actual energy presently embodied in the product. Odum himself had originally used the term “embodied energy” which is employed in the present article for simplicity’s sake. On Odum’s relation to Marx see especially Howard T. Odum and David Scienceman, “An Energy Systems View of Karl Marx’s Concepts of Production and Labor Value,” in *Emergy Synthesis 3: Theory and Applications of the Emergy Methodology*, Proceedings from the Third Biennial Emergy Conference, Gainesville, Florida, January 2004 (Gainesville, FL: Center for Environmental Policy, 2005): 17–43.
27. ↪ Odum, *Environment, Power, and Society in the Twenty-First Century*, 273–77; Odum and Odum, *A Prosperous Way Down*, 139; Howard T. Odum, *Environmental Accounting* (New York: John Wiley and Sons, 1996), 217; Howard T. Odum and J.E. Arding, *Emergy Analysis of Shrimp Mariculture in Ecuador* (Narragansett, RI: Coastal Research Center, University of Rhode Island, 1991), 33–39; Foster and Holleman, “The Theory of Unequal Ecological Exchange.” Odum’s data showed that a few resource-rich economies in the developed world, such as Australia, New Zealand, and (presumably) Canada, also exported more embodied energy than they imported.
28. ↪ Johan Rockström, et. al., “A Safe Operating Space for Humanity,” *Nature* 461, no. 24 (September 2009): 472–75.
29. ↪ For an environmental critique of the role of discounting in a capitalist economy see Foster, Clark, and York, *The Ecological Rift*, 95–97.
30. ↪ Marx, *Capital*, vol. 1, 381.
31. ↪ István Mészáros, *Social Structure and Forms of Consciousness*, vol. 2 (New York: Monthly Review Press, 2011), 15, 24.
32. ↪ The clearest indication of this is Frederick Engels, *The Condition of the Working Class in England* (Chicago: Academy Chicago Publishers, 1969). See also Steven Marcus, *Engels, Manchester and the Working Class* (New York: Random House, 1974), and Howard Waitzkin, *The Second Sickness* (New York: Free Press, 1983).

33. ↪ Naomi Klein, *The Shock Doctrine: The Rise of Disaster Capitalism* (New York: Henry Holt, 2007), and “[Capitalism vs. the Climate](#),” *Nation*, November 28, 2011, <http://thenation.com>.
34. ↪ David Harvey, *The Enigma of Capital* (New York: Oxford University Press, 2010), 228–35.