

Cheap Labor?: Time, Capital and the Reproduction of Human Nature

By this policy of the squandering and destruction of man's productive forces capitalism condemns itself. . . . Deprived of the historical intake of labor-value produced outside its sphere and of the principal brake on falling rates of profit, capitalism may well show itself to be too costly a mode of production to successfully mobilize, as it did at the outset, the productive forces, and therefore to guarantee progress. The coming "final" crisis would then be foreshadowed by the present situation. (Meillasoux, 1981)

The dialectic of capitalization and appropriation turns, fundamentally, on the relations through which humans are re/produced. Thus the centrality of Cheap Labor-Power. Without it, accumulation breaks down. For Marx,

The reproduction of labour power, which must incessantly be re-incorporated into capital as its means of valorization [capital's self-expansion], which cannot get free from capital, and whose enslavement to capital is only concealed by the variety of individual capitalists to whom it sells itself, forms, in fact, a[n] [essential] factor in the reproduction of capital itself. Accumulation of capital is therefore multiplication of the proletariat.¹

To Marx's famous observation we may now add: the accumulation of capital is the multiplication of the proletariat is the appropriation of unpaid work/energy. In turning "blood into capital,"² the capital relation unfolds the production of wealth as value, and the appropriation of unpaid work (the re/production of life) as the condition of value. Capitalism does this under definite geographical conditions. The regime of abstract social labor emerged—even before large-scale industry—under conditions of rapid geographical expansion.³ But the implications of this relation go deeper than arguments about global expansion

¹ Marx, *Capital*, Vol. I (1977), 763–4; Bracketed words from Marx, *Capital*, Vol. I (1967), 575–6. Emphasis added.

² Marx, *Capital*, Vol. I (1977), 382.

³ Moore, "Ecology and the Rise of Capitalism" (2007); C. Tilly, "Demographic Origins of the European Proletariat" (CRSO Working Paper No. 207, Center for Research on Social Organization, University of Michigan, 1979).

as pivotal to the rise of capitalism.⁴ Abstract social labor does not *create* frontiers so much as it *is* a frontier process itself. That frontier is the boundary between commodified and uncommodified life, and capital moves across that boundary through the mapping and quantifying technics of abstract social nature. For all the “self-contained” character of *Capital*, the production of surplus value is not only the proletarianization of labor and the accumulation of capital, but the production of global spaces of appropriation.

Marx has been frequently criticized for reducing the reproduction of labor-power into the consumption of commodities. In the process, we are told, he ignored the contributions of unpaid work (especially domestic work).⁵ This does not seem to be entirely correct. In his classic discussion of “The Working Day,” Marx makes clear that any containment of the reproduction of labor-power within the commodity system would quickly lead to rising labor costs and faltering accumulation. “It would *seem* that the interest of capital itself points in the direction of a normal working day.”⁶ The longer the working day, and the more intensive the work, the greater the “deterioration of human labor-power.”⁷ Not for nothing is capitalism—even *before the era of large-scale industry*—“the first system . . . to provide . . . the impetus for industrial pathology.”⁸ At first glance, such deterioration of labor-power seems to run contrary to capital’s self-interest, since “used up” labor-power must be replaced, an “expensive” proposition.⁹ But, while the “value of labor-power *includes* the value of the commodities necessary for the reproduction of the worker,” the value of these commodities is determined by a *combination* of capitalized and appropriated work—of paid and unpaid work. Valorized labor-power directly determines the value of the commodities necessary for the reproduction of the worker. *At the same time*, unpaid work in reproduction co-determines the socially necessary labor-time that establishes the value of those commodities. This unpaid work/energy, as we have seen, is not limited to the household, but extends to the whole system of Cheap Nature. Necessary labor-time is *co-produced* through capitalization *and* appropriation.

Why *co-produced*? Because capital necessarily draws on zones of uncommodified work (unpaid work); the reproduction of labor-power occurs only *partly* within the zone of commodity production and exchange. To sustain the full costs of household reproduction within the commodity system would

4 Cf. Wallerstein, *The Modern World-System I* (1974).

5 C. Meillassoux, *Maidens, Meal and Money* (Cambridge: Cambridge University Press, 1981); S. Federici, *Revolution at Point Zero* (Oakland: PM Press, 2012).

6 Marx, *Capital*, Vol. I (1977), 377. Emphasis added.

7 *Ibid.*, 376.

8 *Ibid.*, 484.

9 *Ibid.*, 377.

quickly bring the accumulation process to a halt. Fully proletarian households are therefore quite rare in capitalism even today, limited almost entirely to well-paid professional workers (lawyers, doctors, professors, etc.). Historically, even in the heartlands of proletarianization, the reproduction of labor-power has depended on all manner of unpaid work, or work remunerated at a level insufficient to reproduce labor-power *on its own*. The last point is important, because we are dealing with relative *degrees* of unpaid work, shifting configurations of paid and unpaid work in the “semi-proletarian household.”¹⁰ In early twentieth-century America, for example, half of all immigrant women in American cities—at a time when immigrants were the majority in large cities—took in paying boarders, an activity that included all manner of cleaning, cooking, and emotional labor. Indeed, even in mid-sized industrial towns—such as Muncie, Indiana—about half of all working-class families cultivated small vegetable gardens as late as the 1920s.¹¹

There is a temptation to acknowledge this reality of abstract social labor as co-produced through capitalization and appropriation, and at the same time to deny that Marx recognized the problem.¹² And if it were entirely a matter of whether Marx was right—or wrong—it would hardly be worth quibbling about. We would do well to attend to how Marx constructed the argument about the reproduction of labor-power. For Marx consistently moves from *general* abstractions, such as production or population or exchange in general, towards successively more specific, or *determinate*, abstractions.¹³ In an illuminating passage, Marx offers both a general and a determinate abstraction of labor, moving from the former to the latter:

As useful activity directed to the appropriation of natural factors in one form or another, labour is a natural condition of human existence, a condition of material interchange between man and nature, quite independent of the form of society. On the other hand, the labour which posits exchange-value [commodified labor-power] is a specific social form of labour.¹⁴

In *Capital*, we find Marx consistently moving from a “pure” model of capital

¹⁰ J. Smith and I. Wallerstein, *Creating and Transforming Households* (Cambridge: Cambridge University Press, 1992).

¹¹ L. Gordon, “US Women’s History,” in *The New American History*, ed. E. Foner (Philadelphia: Temple University Press, 1990), 271.

¹² Cf. S. Federici, *Revolution at Point Zero* (2012).

¹³ Marx, *Grundrisse* (1973); P. Murray, *Marx’s Theory of Scientific Knowledge* (Atlantic Highlands, NJ: Humanities Press, 1988).

¹⁴ K. Marx, *A Contribution to the Critique of Political Economy*, trans. N.I. Stone (Chicago: Charles H. Kerr & Co., 1904 [orig. 1859]), 33.

accumulation towards more determinate abstractions. The argument in “The Working Day” offers an implicit theory of capitalism’s tendency towards the underproduction of labor-power and the non-market mechanisms for attenuating this contradiction. This is especially evident in his treatment of the reproduction of labor-power. Marx’s initial abstraction of labor-power’s value as defined by the value of commodities is subsequently modified by a new, historically determinate abstraction in which the zone of appropriation is central.¹⁵ Here, “latent” layers of the reserve army of labor are crucial.¹⁶ Having “seized the vital forces of the people at their very roots . . . the degeneration of the industrial population is *retarded only by the constant absorption of primitive and natural* [‘physically uncorrupted’ human] elements from the countryside,”¹⁷ a movement later examined in Marx’s famous discussion of primitive accumulation. Quoting Cairnes with approval, Marx observes that if labor-power can be

*supplied from foreign preserves . . . the duration of [the worker’s] life becomes a matter of less moment than its productiveness while it lasts. It is accordingly a maxim of slave management, in slave importing countries, that the most effective economy is that which takes out of the human chattel in the shortest space of time the utmost of exertion that it is capable of putting forth.*¹⁸

To which Marx adds: “*Mutato nomine te fabula narratur* [The name is changed but the tale is told of you!]. For slave trade, read labor-market, for Kentucky and Virginia [in the slave trade], Ireland and the agricultural districts of England, Scotland, and Wales, for Africa, Germany.¹⁹ For labor-power, read nature. Marx makes the connection directly:

Capital asks no questions about the length of life of labour-power. What interests it is purely and simply the maximum of labour-power that can be set in motion in a working day. It attains this objective by shortening the life of labour-power, *in the same way* as a greedy farmer snatches more produce from the soil by robbing it of its fertility.²⁰

In the same way . . . Here is an insightful dialectical statement about how the capital relation unfolds through the *oikeios*. As we saw in Chapter Three, the

15 Marx, *Capital*, Vol. I (1977), 276–7.

16 Ibid., 796.

17 Ibid., 380.

18 J. Cairnes, *The Slave Power* (London: Parker, Son and Bourn, 1862); Marx, *Capital*, Vol. I (1977), 377.

19 Marx, *Capital*, Vol. I (1977), 376. Emphasis added.

20 Ibid., 378. Emphasis added.

“interdependent process of social metabolism” turns on a singular—but historically differentiated—metabolism of human and extra-human natures. Here we can illuminate the symbolic violence of the Cartesian binary, obscuring the connective tissues between the “shortening of the life” of the worker, and the “robbery” of the soil.

It is difficult to see these connective tissues in most Green Thought. Wake up any environmentalist in the middle of the night and ask: “Where do we see exhaustion and depletion?” The answer is ready-made: in flora and fauna, in soils and resources. But what happens if we invert that answer, and begin from the standpoint of the worker’s exhaustion, and the exhaustion of work-systems? Such an inversion need not be anthropocentric; through it, we may illuminate the unifying relations exhausting human and extra-human natures in the capitalist world-ecology.

If the exhaustion of the worker is paramount, we must ask a crucial question: *Who* is the worker? Not just the wage-worker, to be sure, but all life-activity that “works” within capitalism’s value-relations. As we have seen, some of this work is formal, but much of it is not. A small share of it occurs within factories, offices, and stores, but most of it does not. We may revisit our two major forms of exhaustion—“maxed out” and “wiped out”—first encountered in Chapter Five. Most typical is the former: a given working population becomes *maxed out* when it can no longer deliver a rising stream of work/energy into—or in support of—the circuit of capital. The American working class today is not exhausted in the sense of imminent physical breakdown; it *is* exhausted in its capacity to deliver a rising volume of unpaid work to capital. Its potential for delivering unpaid work is maxed out. The proliferation of “shifts”—a second and third shift in paid and unpaid work—and the neoliberal extension of the workweek give us reason to think that American workers cannot work much more, or much harder.²¹ (On the margins, perhaps, but not more than this.)

Such exhaustion also implicates our second, “wiped out,” moment. This is the specter of an absolute—not just relative—decline in work/energy flows. It can be seen in the sharp rise of mental health problems across the Global North since the 1980s,²² and a cancer epidemic even after the major decline in cigarette smoking, and out of proportion to diagnostic advances.²³ What this means is straightforward: exhaustion takes many forms and cannot be reduced to

21 Cf. Hochschild, *The Second Shift* (1989).

22 HHS [U.S. Department of Health and Human Services], *Health United States 2010* (Washington, D.C.: U.S. Government Printing Office, 2010).

23 M. Davis, *Planet of Slums* (London: Verso, 2006).

biophysical breakdown. Beyond mounting health problems, one could also look at declining fertility—a “baby strike” of proletarian women across the North Atlantic in recent decades, and now extending to industrialized East Asia.²⁴ This suggests that over the course of an accumulation cycle, the relations of reproduction, which were once outside the cash nexus, become progressively monetized. Reproduction becomes channeled through commodity relations, and the share—but not necessarily the mass—of *unpaid* work declines or stagnates. Human nature becomes increasingly capitalized in the old centers of production. That capitalization is hardly without its class politics: the struggle over the terms of the reproduction of labor-power assumes increased salience. Capital becomes increasingly dependent on the *commodified*, rather than the uncommodified, reproduction of life.

Once again we see the tendency of the ecological surplus to fall. Its most obvious indicator is the rising price of the Big Four inputs. Labor, food, energy, and raw materials become more and more expensive.²⁵ The Four Cheaps stop being cheap. This usually does not happen all at once, although this is what we have seen since 2003. The point at which the Four Cheaps stop becoming cheaper and start becoming dear is the *signal* crisis of a phase of capitalism: such crises “signal” the exhaustion of an accumulation regime. For neoliberal capitalism, this signal crisis—far more important than the near-meltdown of the financial system in 2008—began around 2003. Since then, the ecological surplus has been falling, with few signs of an impending reversal. The greatest commodity frontiers have already been exhausted, while the mass of capital continues to rise.

The cyclical resolution of such overaccumulation crises—crises defined by a rising mass of “surplus” capital that cannot be reinvested profitably—has depended upon the cyclical restoration of the Four Cheaps. The falling ecological surplus is therefore closely linked to the contraction of profitable opportunities for investment in the real economy (M-C-M’). Cheap oil, or Cheap labor, or Cheap metals, *make possible* new innovations—such as the railroad and steam engine, or the automobile in their respective eras. (The process is of course cascading, and not a linear process of *first* Cheap Nature, *then* epochal innovation.) The production systems, urban spaces, and infrastructural development implied by these new machines absorbed gigantic volumes of surplus capital. Indeed, the extraordinary history of successive industrializations in the North

24 G. Livingston, and D. Cohn, “The New Demography of American Motherhood,” (Pew Research, 2010), www.pewsocialtrends; *Economist*, “Women in South Korea: A Pram Too Far,” *Economist*, (October 26, 2013).

25 There is, of course, always unevenness between each input, and always geographical variation.

Atlantic between 1790 and 1960—spanning the first, second, and Fordist industrial revolutions—can be told through the ways these epochal inventions (coal/steam, auto/oil) reworked the global *oikeios* and enabled rising contribution of unpaid work/energy. Intriguingly, the information technology “revolution” of the past forty years has been manifestly inadequate in delivering new stream of work/energy, absorbing surplus capital, or advancing labor productivity.²⁶ In making possible those great waves of industrialization, the Four Cheaps are central to the resolution of recurrent overaccumulation crises in historical capitalism. Consequently, the cyclical “end” of the Four Cheaps, in successive accumulation cycles, corresponds to a growing mass of surplus capital with no place to go. The exhaustion of commodity frontiers—and the slowed growth of system-wide unpaid work—is consequently linked strongly to the peculiar forms of financialization that have emerged since the 1970s. As accumulation in the real economy falters, a rising share of capital gravitates towards financial rather than productive activities (M-M’ rather than M-C-M’).²⁷ At some point, of course, these financialized bets on the future must pay off—or the player must go broke.

The ecological surplus—the declining relative contribution of unpaid work to capital accumulation—can decline for several reasons. Among these, five are especially salient. One is that the cash nexus, under conditions of modern territorialism and the extension of abstract social nature, tends to disorganize pre-capitalist arrangements of power and production. Sometimes this dis-organization comes in the form of colonialism, as when the Spanish colonial restructuring of seventeenth-century Peru disorganized village life.²⁸ Such dis-organizations are a cyclical phenomena of the capitalist world-ecology. They were still in play three centuries later, in colonial Africa as capitalist development induced a shift from “rotating” to “irreversible” migration.²⁹ The class struggle itself is a second vector of the falling ecological surplus. Working classes have tended to demand a “family wage”—along with demands for socializing the costs of reproduction, in health care, old age pensions, and education especially.³⁰ This had the effect of “locking in” capital to higher reproduction costs,

26 Foster and McChesney, *The Endless Crisis* (2012); Gordon, “Is US Economic Growth Over?” (2012).

27 M-M’ comes into play during capitalism’s successive financial expansions (see Chapter Six). See Arrighi, *The Long Twentieth Century* (1994); A. Leyshon and N. Thrift (2007), “The Capitalization of Almost Everything,” *Theory, Culture and Society* 24, nos. 7–8 (2007): 97–115.

28 Moore, “Amsterdam Is Standing on Noway, Part I” (2010).

29 Meillassoux, *Maidens, Meal and Money* (1981), 110.

30 Wallerstein, *Historical Capitalism* (1983).

especially in the Global North since the 1970s.³¹ (South-North emigration has been a powerful check on this tendency.) Since then, we have also seen the rise of environmental movements across the world—our third vector. These movements have pushed states to limit pollution, and to clean up the costs of previous pollution. This is the weakest of our vectors until now, because it has been possible—until now—to defer costs in time, to the next generation, and to displace costs over space, from North to South. It is arguably the strongest vector of rising costs in the decades ahead, an issue we explore in the next chapter. A fourth factor is the tendency of radical simplification strategies, such as monoculture, to remove nutrients from agro-ecosystems, and to produce pest- and weed-friendly environments. This tends towards rising energy and toxic inputs, which are themselves increasingly costly. Finally, the falling ecological surplus also implicates the depletion of energy and mineral sources, which, as in agriculture, tend to call forth increasingly costly—and toxic—inputs (e.g., cyanide gold mining, hydraulic fracturing, offshore drilling).

If the declining relative contribution of unpaid work is such a problem, why then does capital tolerate, and at times strongly encourage, the capitalization of reproduction? On balance, capital does so for two big reasons. First, to bring reproduction processes into the circuit of capital allows for particular capitalist agencies (firms) to gain short-run gains in the competitive struggle for shares of world surplus value. A firm needs a regular supply of labor-power no less than raw materials. Second, at a systemic level, the commodification of labor-power, especially during periods of stagnation, increases the consumption of commodities.³² The commodification of food is obviously central here, and the neoliberal experience of “forced underconsumption” (hunger) is scarcely at odds with food’s marketization.

Labor-power is instructive, because it challenges us to think through the differentiated unities of capitalism-in-nature. Capitalism, as Marx suggests, exhausts the soil and the worker through a singular, if uneven, relation. While such exhaustion is absurd, it is not irrational. Over the middle run of a half-century, capitalizing reproduction costs tends to maximize unpaid work. Beyond a half-century, the relative share of unpaid work begins to stagnate, then declines. The capitalized composition of nature rises. The ecological surplus falls. Two consequences ensue: the reproduction costs for capital rise, and capital flows

31 J. Smith, “Transforming Households,” *Social Problems* 34, no. 5 (1987): 416–436.

32 “One of the major forces behind proletarianization has been the world’s workforces themselves. They have understood, often better than their self-proclaimed intellectual spokesmen, how much greater the exploitation [I would say *appropriation*] is in semi-proletarian than in more fully proletarianized households” (Wallerstein, *Historical Capitalism* [1983], 36–37).

towards new labor frontiers. (And often—this is the history of American capitalism especially—labor has moved *towards* the dynamic capitalist centers.) While it would *seem* that the interest of capital itself points in the direction of “sustainable” reproduction regimes, capital’s short-termism and the flexibility of socio-ecological reproduction propel serialized boom/bust sequences in capitalist history—premised on the exhaustive tendencies of capitalization and appropriation. These contradictions are attenuated through the distinctive temporal rhythms of commodity production and socio-ecological reproduction. While the time of paid work is “linear and clock-oriented,” the unpaid work of household reproduction “is grounded in recurring rhythms and patterns of activities that are often cyclical rather than linear, task-based instead of clock-based, and embedded in meaning.”³³ Capital seizes upon the flexibility of reproductive work—up to a point, it can be molded around the disciplines of abstract time—as it invades everyday life, and encompasses more and more work within the logic of abstract social labor. But such flexibility is not infinite. The *real* working day—of paid and unpaid work—cannot be extended without limit.

Commodity production works on a very short time frame. At its longest, this is the business cycle (seven-to-twelve years). Of course, production cycles are even shorter, and have become more so in recent decades, manifested in a profusion of “flexible” forms of capitalist production.³⁴ As Melissa Wright has shown,³⁵ such flexibilization was premised on the rapid appropriation and subsequent exhaustion of women workers across the Global South. The “disposable third world woman worker” became a pillar of Cheap Labor in the neoliberal era.³⁶ As early as the 1970s, 30 percent of South Korean women workers had “a 15-hour or even longer day, [and] disablement as a result of work-accidents . . . increased by an annual average of 17 percent.”³⁷ This was not, of course, a novel development. Seccombe charts a similar trajectory for women and children in the industrializing regions of nineteenth-century England and France.³⁸ What Wright and Seccombe highlight is the historically transient character of cheap labor commodity frontiers. At some point, the

33 M. Hilbrecht, et al., “‘I’m Home for the Kids’: Contradictory Implications for Work-Life Balance of Teleworking Mothers,” *Gender, Work and Organization* 15, no. 5 (2008): 456–7.

34 Harvey, *The Condition of Postmodernity* (1989).

35 M.W. Wright, *Disposable Women and Other Myths of Global Capitalism* (New York: Routledge, 2006).

36 *Ibid.*, 29.

37 A. Lipietz, “Towards Global Fordism,” *New Left Review* I, no. 132 (1982): 33–47.

38 W. Seccombe, *Weathering the Storm* (London: Verso, 1995), 71–80.

flexibility of unpaid reproductive work no longer suffices to sustain a rising ecological surplus.

The implication is banal, but bears emphasis after the “great doubling” of the world’s workforce (actual and potential) since 1990.³⁹ Cheap labor-power is not an eternal condition of capitalist civilization. The provision of labor-power and unpaid work is not merely a “social” question, but a world-ecological question: the value (or cheapness) of labor-power is directly bound up with the unpaid work of humans and the rest of nature. The connection between human labor-power and extra-human work is not distant but intimate, dialectical, immediate.⁴⁰

In place of a Cartesian optic—the “exploitation of labor *and* nature”⁴¹—I would begin with two forms of labor-*in*-nature. One is paid work within the commodity system. The other is unpaid work outside direct commodity production but within the capitalist division of labor. A method premised on the double internality allows us to unify these distinctive moments: whenever we consider labor (labor-*in*-nature) we do best to move immediately to consider nature-*in*-labor, and back again. Labor-*in*-nature is nature-*in*-labor. Work is a co-production of the human and the rest of nature; it is indeed a metabolism, as Marx suggests. And this metabolism takes the form of the law of value—as *connective historical process*—sustained through regimes of abstract social labor and abstract social nature, reproduced through relations of capitalization and appropriation.

This contradictory relation has been one of burning the candle at both ends. On one side we find the production time of capital; on the other side, the reproduction time of life. This strategy works so long as there are plenty of candles to burn, and so long as making new candles is easy. For the lifeblood of capitalism is the life-activity of reproducing human beings who can become workers. If this does not occur “cheaply,” but instead becomes more expensive, the very basis of value—commodified labor-power—becomes a problem. Here the intergenerational reproduction of labor-power enters the stage. Considering the era of the Industrial Revolution, Secombe observes how

Industrial capitalism in the moment of its triumphant breakthrough here revealed its darker side. Private capitalists, under the whip of competition, displayed a ruinous indifference to the most elementary preconditions of the

39 R. Freeman, “What Really Ails Europe (and America),” *The Globalist* (June 3, 2005).

40 Although Green critics have emphasized problems with food, energy and raw materials, labor remains epiphenomenal in their analyses. See, e.g., Heinberg, *Peak Everything* (2007); Foster, *The Ecological Revolution* (2009); J.G. Speth, *The Bridge at the End of the World* (New Haven: Yale University Press, 2008).

41 Foster, et al., *The Ecological Rift* (2010), 80. Emphasis added.

proletariat's life-reproduction, and above all, to women, forced to try to reconcile the antagonistic demands of the daily and generational cycles of labour-power.⁴²

Has it been so different in the long twentieth century?

This “whip of competition” occurs both in production and in the market. It imposes a time-discipline on all capitalist production, but extends far beyond production. Capital's commitment to labor productivity as the metric of wealth reveals capitalism as a *temporal* regime: a system committed to the “annihilation of space by time.”⁴³ The annihilation of space, to be sure, but also the annihilation of life-activity by abstract time: the drive to compel all life-activity to work on the rhythms of capital. The advent of what Thompson calls “industrial time”⁴⁴—which precedes the Industrial Revolution by several centuries—was not just a factory-based phenomenon. It was equally a family phenomenon, and both factory and family transformations were linked tightly with the sugar plantation system, itself organized on industrial time. In nineteenth-century Britain,

food choices were reckoned partly in terms of available time, and not solely in terms of relative cost. [T]he division of labor within the family shaped the evolution of British food preferences; a wife's leaving the house to earn a wage had a restrictive effect on the family diet, even though her work might increase the family income . . . There seems no doubt that [the factory system provided unusual access] to sugar and its by-products [for industrial workers, because these foods allowed] the saving of time, [and therefore partially compensated for the] exhausting jobs it offered women and children. The decline of bread-baking at home was representative of the shift from a traditional cooking system, costly in fuels and in time, toward ‘convenience eating.’ Sweetened preserves [jam], which could be left standing indefinitely without spoiling and without refrigeration, which were cheap and appealing to children, and which tasted better than more costly butter with store-purchased bread, outstripped or replaced porridge, much as tea had replaced milk . . . In practice, the convenience foods freed the wage-earning wife from one or even two meal preparations per day, meanwhile providing large numbers of calories to all her family.⁴⁵

Feminist scholars have frequently suggested the centrality of the contradiction between the reproduction time of life and the reproduction time of capital. But

42 W. Seccombe, “Marxism and Demography,” *New Left Review* I, no. 137 (1983): 44.

43 Marx, *Grundrisse* (1973), 524.

44 E.P. Thompson, “Time, Work-Discipline, and Industrial Capitalism,” (1967): 56–97.

45 Mintz, *Sweetness and Power* (1985), 130.

its implications have yet to be extended to capitalism in the web of life. If we are to grasp the temporal contradiction between life and capital as a limit of capitalist civilization, then we can no longer stay within the Nature/Society binary. It becomes impossible to say that *external* Nature is the limit of civilization—for the very good reason that such limits are co-produced by humans within nature as a whole. Nature is co-produced. Capitalism is co-produced. Limits are co-produced.

If the great concern of environmental historians has, to this point, been space,⁴⁶ it is now possible to consider space-in-time (and time-in-space). Hence, the centrality of work. Central to the law of value is the drive to reduce socially necessary turnover time of capital to zero—an ambition that comes closest to reality in the high-frequency currency trading of the twenty-first century. This drive to reduce the turnover time of capital to zero is, in fact, a pivotal moment in the environmental history of capitalism, reaching beyond the domains of production, exchange, transportation, and communication.⁴⁷ The annihilation of space by time transforms all life and space within the law of value's gravitational pull. Consider, for instance, the “factory farming” revolution in meat production. This revolution effected the transition from the 73-day chicken in 1955 to the 42-day chicken in 1995 in North America.⁴⁸ Perhaps even more dramatically, we can see this revolution in the transformation of pork production in China, where the 12-month pig in 1978 had become a 6-month pig by 2011.⁴⁹ Here the “factory *as* environment” is on full display.⁵⁰

Is it so different for human workers? The danger is to see “factory farming” as an environmental question and “factory production” as a social question. But such dualism simply obscures too many questions in capitalism's production of time, space, and nature. The transition from Fordist to neoliberal meatpacking in the United States—we may recall the nineteenth-century origins of the modern assembly line in American meatpacking⁵¹—was a transition from well-paid and reasonably safe work to low-paid and highly dangerous work after 1980. This transformation not only rendered meatpacking the most dangerous industrial job in America, but radically undermined food safety, as outbreaks of

46 But see Cronon, *Nature's Metropolis* (1991).

47 Harvey, *The Condition of Postmodernity* (1989); Warf, *Time-Space Compression* (2008).

48 W. Boyd, “Making Meat,” *Technology and Culture* 42, no. 4 (2002): 631–64.

49 M. Schneider, *Feeding China's Pigs* (Minneapolis: Institute for Agriculture and Trade Policy, 2011); M. MacDonald and S. Iyer, *Skillful Means: The Challenges of China's Encounter with Factory Farming* (New York: BrighterGreen, 2011).

50 C. Sellers, “Factory as Environment,” *Environmental History Review* 18, no. 1 (1994): 55–83.

51 Cronon, *Nature's Metropolis* (1991).

bacterial contamination proliferated.⁵² Given the centrality of Cheap labor-power, we might also point out the centrality of Latino immigrants in the neoliberal meatpacking sector. The delivery of this Cheap Labor was made possible by a two-pronged class offensive. One was carried out within national boundaries, resulting in the simultaneous destruction of the agrarian petite bourgeoisie and industrial working-class power⁵³—in this case, the medium-sized family pork farmers and highly-organized meatpacking workers.⁵⁴ The other movement of class struggle assumed a neocolonial and neoliberal character, as Mexico's agrarian order was progressively destabilized, especially after 1994. The annihilation of space by time—and its coordinates in the new configuration of space-time and time-space—signals the accumulation of capital, the pursuit of power, and the co-production of nature . . . *all at the same time!*

This acceleration of historical change—the time-space compression of life and space⁵⁵—is hardly of recent vintage. It was part and parcel of the rise of capitalism.⁵⁶ The rise of “abstract time” was central; the annihilation of space by time could occur only when temporality could be grasped as an “independent” variable.⁵⁷ Independent of what? In the first instance, independent of land productivity as the basis of civilization. When power resided in the control of land, as in feudal Europe or Song China, civilizational time was the time of the seasons, of sowings and harvests, births and deaths, of “cataclysms and festivals.”⁵⁸ It was an irregular sort of time. Even here, we should remember that women and men, in power and in everyday life, actively co-produced time; they were not passive subjects of “natural” cycles. Nevertheless, the influence of the latter was strong, and in such civilizations, either the capacity or the motivation (or both) to create abstract time was lacking. Those capacities and motivations would begin to shift in fourteenth-century Europe. The first mechanical clocks appeared at the end of the thirteenth century, and over the long

52 L. Gouveia and A. Juska, “Taming Nature, Taming Workers,” *Sociologia Ruralis* 42, no. 4 (2002): 370–90.

53 K. Moody, *An Injury to All* (London: Verso, 1988); C. MacLennan and R. Walker, “Crisis and Change in U.S. Agriculture,” in *Agribusiness in the Americas*, ed. R. Burbach and P. Flynn (New York: Monthly Review Press, 1980), 21–40.

54 Food and Water Watch, *The Economic Cost of Food Monopolies*, (Washington, D.C.: Food and Water Watch), 2012; P.J. Rachleff, *Hard-Pressed in the Heartland* (Boston: South End Press, 1993).

55 Harvey, *The Condition of Postmodernity* (1989).

56 Moore, “Ecology and the Rise of Capitalism” (2007); Warf, *Time-Space Compression* (2008), 40–77.

57 Postone, *Time, Labor, and Social Domination* (1993).

58 G.J. Whitrow, *Time in History* (Oxford: Oxford University Press, 1989), 110.

fourteenth-century crisis, clocks would become a feature of everyday life in urban-industrial Europe. This transition from clocks to clock-time was indeed novel. This was less a matter of technology than of *technics*—a clock is clock. It becomes clock-time, converging technology, power, and nature, only under definite circumstances.⁵⁹

A civilization premised on money and labor-time called forth a very different kind of time. On balance, European feudalism remained in the pre-modern pattern of boom and bust, premised on dynamics of land productivity, frontier expansion, and lord-peasant relations. But it was also a civilization premised on an extraordinary fragmentation of power and wealth. This allowed for new concentrations of proletarianization and manufacturing, especially from the later thirteenth century, that prefigured the rise of capitalism. “Great clothing towns such as Douai, Ypres or Brussels . . . [could be compared to] one vast factory,” with bells regulating the start and end of the working day.⁶⁰ By the early fourteenth century, bell-time would retreat before the rapid advance of clock-time; this was still something short of abstract time, but it was also something increasingly removed from the agrarian-time of the tenth century. By the middle of the fourteenth century, “the uniform hour of sixty minutes soon . . . [replaced] the day as the fundamental unit of labour time in the textile industry.” The new, time-segmented working day became the object of intense class struggles during the protracted feudal crisis.⁶¹ Indeed, it is in this era of epochal crisis that we find the origins of the idea of labor *productivity* with its sensibility that “time is money.”⁶²

By the end of the fourteenth century, clock-time, with its 60-minute hours, “was firmly established in the major urbanized areas of western Europe, replacing the day as the basic unit of time.”⁶³ And if the first stirrings of abstract time had originated in monasteries, by 1370—at least in France—clock-time was

59 And so, for example, Su Sung, in eleventh-century China, had invented a mechanical clock, but one designed for the Emperor, not for everyday life. J. Needham, et al., *Heavenly Clockwork: The Great Astronomical Clocks of Medieval China*, 2nd ed. (Cambridge: Cambridge University Press, 1986 [1960 orig.]).

60 E.M. Carus-Wilson, “The Woolens Industry,” in *The Cambridge Economic History of Europe*, Vol. 2, eds. M. Postan and E.E. Rich (Cambridge: Cambridge University Press, 1952), 644.

61 G.J. Whitrow, *Time in History* (Oxford: Oxford University Press, 1989), 108; J. Le Goff, *Time, Work and Culture in the Middle Ages* (Chicago: University of Chicago Press, 1980), 43–52.

62 D. Landes, *The Wealth and Poverty of Nations* (New York: W.W. Norton, 1998), 49–50.

63 J. Le Goff, *Time, Work and Culture in the Middle Ages* (Chicago: University of Chicago Press, 1980), 49.

relentlessly secularized: “the new time . . . [had become] the time of the state.”⁶⁴ What distinguished this new time was not simply its linearity and regularity, but the ways in which time was represented as “exterior to life.”⁶⁵ The clock (as *technics*) did for time what Renaissance perspective did for space. It “dissociate[d] time from human events and . . . create[d] the belief in an independent world of mathematically measurable sequences.”⁶⁶

By the advent of the long sixteenth century, the outward thrust of European capitalists and states fused clock-time with “merchant’s time” in its broader sense.⁶⁷ We began to see new forms of world-time—abstract time—that were more than “merely a means of keeping track of the hours.” Abstract time became a means of “synchronizing the actions of men” and nature,⁶⁸ in a new tapestry of money, commodity production, and state power.

This “revolution in time”⁶⁹ underpinned early capitalism’s revolution in space, and the sharp acceleration of landscape change that occurred after 1450 (see Chapter Seven). This acceleration is rooted in the historical relation of value as a utopian project, which has real-world correspondence in the acceleration of environmental change: hence the importance of capital’s correspondence project. This project, as we have seen, seeks to reduce the time of life to the time of accumulation. This is obviously impossible. Nevertheless, the desire for instantaneous capitalism animates the grim compulsions of world accumulation. It is, then, not only the “radical simplification” of landscapes and other natures that reveals the law of value at work; it is also the drive to make the “time of nature” ever closer to the “time of capital.”

This is capitalism’s *correspondence project*, through which capital seeks to remake reality in its own image, and according to its own rhythms. Agricultural landscapes become exhausted because capital must extract unpaid work faster than agro-ecological relations can reproduce themselves. Working classes become exhausted because capital must extract surplus labor as fast as possible. Particular capitalists might gain in the process, but over time, *capital as a whole suffers* because the system-wide capitalization of reproduction costs proceeds apace. The share of unpaid work declines. The ecological surplus falls.

64 Ibid., 50.

65 A.J. Gurevich, “Time as a Problem of Cultural History,” in *Cultures and Time*, ed. L. Gardet, et al. (Paris: UNESCO Press, 1976), 241.

66 Mumford, *Technics and Civilization* (1934), 15.

67 Le Goff, *Time, Work and Culture in the Middle Ages* (1980).

68 Mumford, *Technics and Civilization* (1934), 14.

69 Landes, *Revolution in Time* (1983).

THE RISE AND DEMISE OF CHEAP NATURE: THE NEOLIBERAL MOMENT

Can the tendency of the ecological surplus to fall be seen during the neoliberal era? We may recall that a high world-ecological surplus represents a ratio of low capitalization to high appropriation. This is a necessary condition for the revival of accumulation. The neoliberal “boom” that commenced after 1983 was accompanied—or preceded—by a significant cyclical decline in food, energy, and resource prices. Commodity prices for food declined 39 percent—and metals by half—between 1975 and 1989. Meanwhile, oil stabilized by 1983, for the next twenty years, at a price per barrel about twice that of the postwar era.⁷⁰

But it was not only extra-human natures that became Cheap.

The 1980s revival of accumulation also turned on Cheap Labor. This entailed an accumulation regime that could supply both paid and unpaid work in sufficient volumes to restore accumulation. In formal terms, re-establishing Cheap Labor meant reducing the value of labor-power. This was not easy to accomplish. There were five key dimensions of the neoliberal project to restore Cheap Labor after 1973. The first was wage repression. Bourgeoisies across the Global North began to organize as a class, and moved aggressively against trade unions following the 1974–1975 recession.⁷¹ Wage repression was especially important as labor productivity growth sagged in the 1970s, a deceleration that increasingly looks permanent.⁷² Second, the falling rate of profit in American industry—induced both by labor’s class power and the rising organic composition of capital—led American and other capitalists to move rapidly towards the “global factory” in the 1970s.⁷³ This was a tectonic shift in world history that entailed the simultaneous de-industrialization of core zones and

⁷⁰ P. McMichael, “Global Development and the Corporate Food Regime,” in *New Directions in the Sociology of Global Development*, ed. F. Htel and P. McMichael (Oxford: Elsevier, 2005). M. Radetzki, “The Anatomy of Three Commodity Booms,” *Resources Policy* 31 (2006): 56–64. D. van der Mensbrugge, et al., “Macroeconomic Environment and Commodity Markets,” in *Looking Ahead in World Food and Agriculture*, ed. P. Conforti (Rome: FAO, 2011). MGI [McKinsey Global Institute], “MGI’s Commodity Price Index—an Interactive Tool,” (2014), www.mckinsey.com.

⁷¹ Moody, *An Injury to All* (1988).

⁷² R.J. Gordon, “Revisiting U.S. Productivity Growth over the Past Century with a View of the Future” (Working Paper 15834, Cambridge: National Bureau Of Economics Research, 2010); R.J. Gordon, “Is U.S. Economic Growth Over?” (2012).

⁷³ R. Barnett, *The Lean Years* (New York: Simon and Schuster, 1980); D.M. Gordon, et al., *Segmented Work, Divided Workers* (Cambridge: Cambridge University Press, 1982).

the rapid industrialization of the Global South.⁷⁴ Third, the global factory depended upon the “great global enclosure” that commenced in the early 1980s.⁷⁵ These global enclosures, realized through structural adjustment programs and market liberalization, restructured agrarian class relations worldwide, dispossessing hundreds of millions of peasants worldwide. In China alone, some 200–300 million migrants moved from countryside to city.⁷⁶ This new global proletariat dwarfed any that had come before it. In concert with the opening of Russia, China, and India to the world market, the world proletariat doubled after 1989.⁷⁷ Fourth, this “great doubling” represented an even greater expansion of the female proletariat, adding paid work on top of unpaid work on an unprecedented scale. Neoliberal proletarianization was, in this reckoning, an unprecedented global expansion of Hochschild’s “second shift.”⁷⁸ Finally—and almost universally ignored by environmentalists—Cheap Labor was made possible through a new regime of “forced underconsumption,” manifested in wage repression in the North and declining well-being across the South (China excepted).⁷⁹

By 2003, the world-ecological surplus stopped rising, and began to decline. Registered by the slow-, then fast-moving, commodity boom, this was the signal crisis of neoliberalism as a way of organizing nature. This expression of crisis signals the beginning of a cyclical contraction of the ecological surplus; its clearest indicator was the rising price of metals, energy, and food commodity prices. But this was not just any commodity boom, not least because of its unusual durability—although past its peak in terms of prices (at least for now), it remains a “boom” in the sense that prices remain considerably above their 1980–2000 averages. What does this seemingly endless commodity boom indicate? At a minimum, the peculiar character of this boom—which included more primary commodities, lasted longer, and saw more price volatility than any previous commodity boom in modern world history⁸⁰—indicates an exhaustion of neoliberalism’s Cheap Nature strategy. Notably, neoliberalism’s strategies for reducing the Big Four input prices began to falter at least five years prior to the financial events of 2008. Economists talk of this very long commodity boom as a “supercycle”—a decades-long increase

74 G. Arrighi, et al., “Industrial Convergence, Globalization, and the Persistence of the North-South Divide,” *Studies in Comparative International Development* 38, no. 1 (2003): 3–31.

75 F. Araghi, “The Great Global Enclosure of Our Times” (2000).

76 M. Webber, “The Dynamics of Primitive Accumulation,” *Environment and Planning A* 44, no. 3 (2012): 560–579.

77 Freeman, “What Really Ails Europe (and America)” (2005).

78 Hochschild, *The Second Shift* (1989).

79 Araghi, “Accumulation by Displacement” (2009).

80 World Bank, *Global Economic Prospects 2009* (2009).

in basic commodity prices. But so far, they have invoked an abstract “world of scarcity”⁸¹ rather than consider the possibility that today’s supercycle represents a historical limit to capitalism’s *longue durée* regime of Cheap Nature.

Suggestive of such co-produced limits is the erosion of Cheap Labor. In other words, the signal crisis of neoliberalism is not merely a question of extra-human natures—reflected in the commodity boom—but of human nature too. In China, real wages increased 300 percent between 1990 and 2005.⁸² Manufacturing wages grew six times faster than the rate of inflation, and unit labor costs rose 85 percent between 2000 and 2011.⁸³ Rising unit labor costs are all the more peculiar given the spectacular increase in labor productivity: output per Chinese worker grew 7.2 percent annually between 1993 and 2013.⁸⁴

Meanwhile, the usual strategy of moving to Cheap Labor frontiers—seeking new streams of unpaid work in support of low-wage workers—is in motion, but with diminishing returns. Within China, the government’s “Go West” policy, which aimed to attract industry to the interior, has narrowed labor costs between interior and coastal regions to a “surprisingly . . . paltry wage differential.”⁸⁵ Rural-to-urban migration has slowed considerably in recent years.⁸⁶ By 2012, per capita foreign investment in Cambodia moved ahead of China.⁸⁷ But Cambodia is much smaller than China, which is part of the broader problem: the frontiers are shrinking at the very moment when capital needs ever-greater commodity frontiers to resolve the overaccumulation problem. Meanwhile, the very information and communication technologies that have made possible global production are now also being used in the class struggle:

Workers in Cambodia today have begun syndical action after only a few years, not after twenty-five. There are strikes and pressure for higher wages and benefits, which they are receiving. This of course reduces the value for the multinationals of moving to Cambodia, or Myanmar, or Vietnam, or the

81 Jacks, “From Boom to Bust?” (2013).

82 Midnightnotes.org, “Promissory Notes. From Crisis to Commons” (2009).

83 USDC [United States Department of Commerce], “Assess Costs Everywhere” (2013). Accessed April 24, 2013, acetool.commerce.gov/labor-costs.

84 ILO [International Labour Office], *Global Employment Trends 2014: Risk of a Jobless Recovery?* (Geneva: International Labour Office, 2014), 52.

85 J. Scott, “Who Will Take Over China’s Role as the World’s Factory Floor?” *Saturna Sextant Newsletter* (August 2011), 1.

86 B. Fegley, “30 Years of Double-Digit Chinese Growth,” *From the Yardarm* 7, no. 1 (2013).

87 K. Bradsher, “Wary of China, Companies Head to Cambodia,” *New York Times* (April 8, 2013).

Philippines. It now turns out that the savings of moving from China are not all that great.⁸⁸

The ongoing erosion of Cheap Labor is not exclusively an East Asian story. Less well understood, but no less significant, is the transition across the Global North to a “second (and third) shift”—wage work plus unpaid reproductive labor. This transition enacted and embodied one of the last great commodity frontiers of historical capitalism. Unpaid household work has been a pillar of endless commodification since the sixteenth century.⁸⁹ In the Global North, and especially in North America, after 1970 we witnessed the accelerated proletarianization of women. This marked the demise of the Fordist one-income family and the rise of the “flexible” two-income household. This 1970s acceleration had been prefigured by Soviet developmentalism,⁹⁰ and also by the fast entry of American women into paid work since the 1930s.⁹¹ These, too, were commodity frontiers, marked by the progressive commodification of work-potential and the progressive appropriation of (human) nature’s “free gifts.” Hence the imposition of multiple “shifts,” and the double squeeze on women’s time via the simultaneously operating pressures of capitalization and appropriation; even as early as the mid-1960s a growing number of married American women had traded in their 55-hour work week at home for the 76-hour work week at home and (paid) work.⁹² If this were all—as in Hochschild’s⁹³ rendering of the commodity frontier—there would be little to add. What the theory of the commodity frontier illuminates is not only the pattern of successively paired commodifying/appropriating movements, but the finite opportunities inscribed in each such movement. In the United States, the extraordinarily rapid increase in mothers’ labor force participation—50 percent between 1975 and 1995⁹⁴—was not only a

88 I. Wallerstein, “End of the Road for Runaway Factories?” Commentary 351 (April 15, 2013). Accessed November 14, 2013, www2.binghamton.edu/fbc/commentaries/archive-2013/351en.htm.

89 M. Mies, *Patriarchy and Accumulation* (1986).

90 M. Sacks, “Unchanging Times,” *Journal of Marriage and Family* 39, no. 4 (1977): 793–805.

91 C. Goldin, “Gender Gap,” in *The Concise Encyclopedia of Economics*, ed. D.R. Henderson (2008). Accessed May 1, 2013, www.econlib.org/library/Enc/GenderGap.html.

92 H.I. Hartmann, “The Family as the Locus of Gender, Class, and Political Struggle,” *Signs* 6, no. 3 (1981): 366–94.

93 A. Hochschild, “The Commodity Frontier,” (Working Paper No. 1, Center for Working Families, University of California, Berkeley, 2002).

94 BLS (Bureau of Labor Statistics), “Labor Force Participation Rate of Mothers, 1975–2007,” *The Editor’s Desk*, (January 8, 2009). Accessed May 1, 2013, www.bls.gov/opub/ted/2009/jan/wk1/arto4.htm.

powerful moment of neoliberal wage repression while maintaining effective (consumer) demand; it was also a one-shot deal. The commodity frontier is a one-way ticket. Frontiers, once appropriated and commodified, are no longer frontiers. They do, however, move on, as we have seen in the rollout of the proletarian relation for women across the Global South since the 1980s.⁹⁵

CONCLUSION

The appropriation of unpaid domestic labor and extra-human nature's bounty—*both* unpaid work—is not a residual of real production in capitalism. Rather the cyclical and relentless expansion of the zone of appropriation of unpaid work is, along with the revolutionizing of commodity production, the decisive requirement of accumulation. The imperative faced by capital to expand the zone of unpaid work faster than the capitalization of the *oikeios* is the historical basis through which capitalist power lumped together the epoch-making appropriations of “women, nature, and colonies.”⁹⁶ Without women, nature, and colonies—a stylized list, to be sure—accumulation falters. The appropriation of de-valued work must necessarily outweigh the capitalization of work, lest the costs of the Big Four inputs (labor-power, food, energy, raw materials) begin to rise, and opportunities for accumulation through commodity production and exchange (M-C-M') begin to decline.

The possibility of the “end” of Cheap Labor can only be adequately understood through the central systemic nexus of the capitalist division of labor: the relation between food and labor-power. To this we now turn.

⁹⁵ N. Kabeer, *Marriage, Motherhood and Masculinity in the Global Economy* (IDS Working Paper 290, Institute for Development Studies, University of Sussex, 2007); McMichael, *Development and Social Change*, 5th ed. (2012).

⁹⁶ M. Mies, *Patriarchy and Accumulation* (1986).