

10: The Law of Value and Marxian Political Ecology¹

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CAN LEFTIST ENVIRONMENTALISTS learn from Marxian political economy? Or is Marxian political economy part of "a stock of intellectual capital...that is demonstrably obsolete," as Nancy Folbre (1989) suggests?

My aim here is not to present a systematic critique of Folbre's interesting discussion; I come not to bury Folbre but to use her ideas to develop lessons both for and from Marxian political ecology.² I believe that this fits her goal — to her goal — to stimulate us to re-think and clarify Marxian political economy.

I hope to show that even Marx's law of value (a.k.a. the "labour theory of value") can say something new about environmental issues.³ This "law," frequently seen either as a set of matrix models using simultaneous equations to calculate prices or as a welter of obscure jargon, often seems too abstract if not downright irrelevant. Here I try to bring the discussion down to earth by presenting the law of value as a heuristic that sheds light on questions often ignored by the usual "labour theory of value" and other theories.

This chapter first states my interpretation of the purposes of Marx's law of value ("LoV") and then applies this LoV to ecological issues. The application of this conception reveals the dynamic of capitalism towards both the increasing destruction of nature and the increasingly overt socialization of production (in order to prevent that destruction). However, the actual results that we will see depend on environmentalist and other struggles against the depredations of capital.

What Is Value For?

A crucial question that is seldom probed and that Marx himself hardly addressed in print is: what are the *purposes* of the LoV? My purpose is not to engage in a long exegesis of Marx's work to discern

these aims. Rather, I will simply make theoretical assertions based on my readings. Readers can judge for themselves the accuracy of my assertions, and, more importantly, the relevance of these points to ecological issues.

To Folbre, the LoV "provides no effective guide to ecologically sustainable production." In my reading, Marx did not see the LoV as a tool for *any type* of policy-making under either capitalism or socialism. We cannot rule out the possibility that the LoV has something to say about policy, but Marx's *Capital* is hardly a contribution to the field of public policy. Further, just because a theory has no implications for creating an ideal government policy does not mean we should throw it out. After all, there are other goals for theory and other available theories, if one must make policy (and, more importantly, if one has the power to do so). The LoV is not — and should not be — the only heuristic that Marxists or other leftists use. No defence of the LoV — or of Marxism in general — should be seen as implying that one should shut one's mind.⁴

What, then, are the purposes of the LoV? The Sraffian critique of the common vision of Marx's value theory as a way to calculate prices is very strong. Ian Steedman's *Marx after Sraffa* (1981) provides the *reductio ad absurdum* of the LoV as a "labour theory of price" in the tradition of David Ricardo: if we see values as tools for calculating prices we get ambiguous results and find that "labour values" are redundant. I believe, however, that such a price-calculation theory is far from Marx's intent. Thus I have returned to Marx's original term (LoV), to stress its distinction from the Ricardian theory (see Devine 1990).

Marx's goals for the LoV were to analyse the societal nature and laws of motion of the capitalism; another way of saying this is that the LoV summarizes the method of analysis that Marx applies in *Capital*. The LoV is part of what Imre Lakatos (1970) terms the "hard core" of tautologies and simplifying assumptions that is a necessary part of any research program.⁵ The quantitative aspect of value should be seen as a true-by-definition accounting framework to be used to break through the fetishism of commodities — allowing the analysis of capitalism as a social system. Prices, the accounting framework most used by economists, both reflect existing social relations and distort their appearance. It is necessary to have an alternative to prices if one wants to understand what is going on behind the level of appearances: looking at what people do in production (that is: labour, value) helps reveal the social relations between them.

My reading suggests that the main purpose of the LoV is to answer a number of questions:

1. What are the basic principles of commodity production, that is, the nature of value, use-value, and exchange-value?
2. Where do profits come from under capitalism?
3. How are prices determined? Why do they deviate from values under capitalism?
4. Why and how are profits distributed among capitalists?
5. How are prices connected to values, and individual profits connected to aggregate surplus value, despite the price-value deviation?
6. What are the laws of motion of capitalism?

In this vision, the value-price deviations of point 3 and the commodity fetishism that results therefrom are just as important to the LoV as the value-price connections emphasized by the "transformation problem" literature (point 5). So instead of the calculation of prices from given values, there are both *contrasts* and *connections* between the social reality (values) and the appearances seen by individual participants in the system.

For any theory, it is as important to note its limits as it is its uses. Here it should be noted that seeing the LoV as a tool of social-scientific analysis means that it is by definition *incomplete* for the purposes of understanding the natural environment: since human society is but a small part of nature, socio-analysis must be complemented by knowledge from the natural sciences. These dimensions, however, are not treated in any detail in this article.

Value and Ecology

1. *Value and Use-Value.* In the first three chapters of *Capital* and in related works, Marx critiqued, summarized, clarified, and extended the classical analysis of value, use-value, and exchange-value, drawing out new insights about the nature of commodity production in general and of capitalism in specific. My intention here, however, rather than summarizing his work, is to fill an apparent lacuna that directly relates to the environment.⁶

A gap seems to exist in Marx's LoV concerning the role of external costs (externalities). Marx, of course, never used this concept, referring instead to the much more complex concept of *socialized production*. The "socialization of production" involves two types of phenomena. One is "latent" socialization, connections among individuals that are external to, and not regularized in, voluntary contracts or institutions (formal or informal organizations). This includes the fami-

liar direct or technical externalities (such as pollution costs), pecuniary externalities, and macrosocietal relationships such as "conservation principles."⁷ These types of socialization are often not obvious or even visible to people in the economy or to economists. The second type is "overt" socialization, which includes non-market relations in the production process (such as corporate bureaucracies), the role of government in production, or community and family organizations. For these, the existence and nature of social relations among individuals are much more apparent.

Marx assumed that production was socialized (in both ways) and did not separate out technical externalities for any special consideration. The mainstream concept of "externality" only arises if one starts (as did the neoclassicals) with the idea that most or even all commodities are entirely private in their impact, that is, they can be totally contained within the voluntary exchange relationship. But its origin does not rule out the fact of this concept having a role in Marxism. Although modern Marxists have embraced it, however, I have not yet seen externalities integrated into the LoV.

Marx's view of production as socialized — that is, that an individual commodity's value depended on societal standards — should not deceive us into counting external costs as part of a commodity's value.⁸ Under capitalism, and more generally under commodity production, appropriation of the commodity, income, and profit is *individualized*, and it is this status that is relevant here. Value depends only on the labour-time spent to produce a product as a commodity: as a use-value for sale. In quantitative terms, the value of a commodity does not include the labour-time that goes into cleaning up the messes of or responding to the environmental disasters resulting from the good's production and/or use. Nor does this value include the labour spent dealing with the medical problems caused by pollution. Rather, value is the socially necessary abstract labour-time ("Snalt") needed simply to produce the commodity so that it can be brought to market and sold. As with prices, external costs only count as part of value if capitalists are forced to internalize them (that is, pay for them).

As a result, although a commodity must have use-value to some individual (in order to sell, realizing its value), its value and thus its exchange-value and price do not automatically reflect use-value from either a non-purchaser's or the society's viewpoint. That is, there is often a contradiction between use-value and exchange-value.⁹ What is good for humanity (societal use-value) in the short or long run does

not correspond — and often contradicts — what sells in the market and what thus motivates capitalists (exchange-value). This is not simply a moral contradiction of "ought" versus "is". As made clear by Engels (1880) and as developed below, this contradiction is related to the contradiction between socialized production and individualized appropriation. This tends to lead to the increasingly overt socialization of production, the slow abolition of atomized relationships among people.

This discussion sheds light on Folbre's criticism of economists (including leftists) who often use measures of Gross Domestic Product — because this is an inadequate measure, given the omission of household labour, environmental impacts, and the like. Folbre suggests that what should be used, instead, is a measure that does not have these flaws, such as the Net Economic Welfare (NEW) of Nordhaus and Tobin (1972).¹⁰

Given this interpretation, however, the Marxian LoV would suggest that instead of jettisoning one or the other, we should utilize *both* GDP and the NEW. The GDP is a measure of aggregate exchange-value (in price terms).¹¹ The NEW represents an effort to measure aggregate use-value. The contrast between the two dramatizes the difference between use-value and exchange-value. GDP is clearly more relevant to the description of business activity in any commodity-producing society (including capitalism) and plays a role in determining the economy's behaviour on the macro level; in a society dependent on market relations, GDP is a clear determinant of the availability of jobs and livelihood.¹² But to the extent that it can actually be measured, the NEW is important from an ethical or socialist perspective.¹³ Crudely put, the GDP versus NEW conflict quantifies the common "jobs versus the environment" problem, on the aggregate level.

2. *The Origin of Profits.* Now we move from issues of commodity production in general to those specific to capitalism: generalized commodity production, under which labour power is a commodity. In line with this, we also move from measures of total market transactions (such as GDP) to issues of profits and surplus value. For Marx, in discussing capitalism at the macrosocietal level during any period of time, profits arise only from the exploitation of wage labour. Here consider a short time-period (call it a "Week") in order to abstract from the role in which prices and decisions based on prices feed back to affect values; thus, values are taken as given during a Week.¹⁴ This is true for the social formation as a whole, if we assume that no sur-

plus labour is "imported" from other modes of exploitation, including household production (assumption A1). The exclusion of surplus arising from household production (along with feudalism and so forth) is a common simplifying assumption of many Marxian analyses. Although based on an analysis that is far from compelling, it will be made here to simplify matters.

While the Marxian LoV centres on the exploitation of wage labour, Folbre admires the fact that in a Sraffian matrix model of price determination, "nature, like labour, can yield a surplus." But it is a mistake to attach any ethical meaning to a sector's production or non-production of surplus value or of a surplus — or to see that the Marxian proposition in some way "writes off" nature. Just because nature, in the Marxian view, produces no surplus value does not imply that nature is (or should be) either ethically or empirically unimportant to socialists or capitalists.¹⁵ In fact, since exploitation and surplus value are concepts referring to human interactions (social relations), all it says is that the relationship between capitalism and nature is not a relation among people.

One implication of the long (and perhaps fruitless) debate on "unproductive" labour is that "productive" is an "ethical value" only from the point of view of capital as a whole.¹⁶ In much of *Capital* Marx deliberately viewed capitalism from its own perspective: one's labour is "productive" only if one serves capital by producing surplus value during a Week. The ethical meaning of productive labour might be seen as analogous to that of a "productive cough," which gets that label because it produces sputum. That production is beneficial to the body, but hardly pleasant. Similarly, the fact that a commodity has a positive value is an "ethical plus" only from the perspective of commodity production. These points restate the distinction between value and use-value.

Further, the Sraffian view that nature (or steel or peanuts) produces a surplus is simply a result of unexplained assumptions about coefficients in the technical input-output matrix. Because the coefficients have no theory behind them, they can be parts of interesting mathematical models, but form incomplete theories. Marx presents social and economic reasons why the "technical" input-output coefficients should be such that labour produces surplus value (1967a). He further argues that although the purchase (and sale) of commodities other than labour power may be profitable to individuals, it will not produce surplus value on the societal level.

On the macrosocietal level, in this view, nature is to capitalists unimportant as a source of profits during any Week. But that does not apply on the micro level: as any real estate agent knows, owning "a piece of nature" can be quite profitable. The natural fertility of the soil can raise the productivity of labour, allowing an individual to receive "land rent."

Whatever nature's value to capitalism, it definitely has use-value and is used to produce use-values. More profoundly, nature is both the origin and the home of humanity. Humanity might be seen as nature's largest parasite, a parasite quite dependent (so far) on the host's health. Going beyond any given Week, nature has an important ultimate effect on profits; environmental degradation does not simply hurt workers, because it can eventually make capitalist production more costly and thus less profitable.

3. *Price-Value Deviation.* To Folbre, the LoV "by its very definition" ignores the exhaustion of the many goods that require no labour for extraction. This can be seen to be inaccurate if we re-examine the LoV. A "typical" commodity has both a value and a price. Its value is the Snalt needed to produce or reproduce it.

Prices differ from these values because society's aggregate product is divided into diverse use-values, which are appropriated individually. In very simple terms, market prices are determined by the competition of particular capitals (and other commodity sellers), that is, by the supply of and the demand for use-values — while values are not. Values are determined by the latent socialization of labour: for inter-industry relations, values are determined under assumptions that simulate what capitalism would be like if it formed "one big factory," with no competition of capitals.¹⁷ That is, values reflect the latent socialized nature of production, under "capital in general," abstract capital.

Implicit in this (and in the following discussion) is the simplifying assumption (A2) that the value of money is constant and equals unity (hours of Snalt per peso). Thus, we can talk of price-value equality (or deviation) rather than proportionality (or deviation from proportionality).

Returning to Folbre's point, we must examine non-typical commodities. The LoV does not ignore goods that require no labour for extraction. It is quite possible for a use-value to have no value but a positive market price. Such is the case of uncultivated lands and raw materials yet to be extracted (pieces of nature).¹⁸ Such so-called "free

goods" as air are really no different: they have no value but have a price, which in this case equals zero.¹⁹

Whether for typical or atypical commodities, price-value deviations obscure the class nature of capitalism: the fact that on the micro level price differs from value and a capitalist's claim on profits does not equal the surplus value produced by his or her workers makes it very difficult for individuals inside the system (including economists) to understand either capitalism as a social system or the source of profits. This results in what Marx dubbed "the fetishism of commodities" or, in volume III of *Capital*, "the illusions created by competition." These illusions are not "false consciousness" in the sense of ignorance or ideology based on self-interests or religion, but instead are accurate perceptions of capitalist reality as seen from the inside. Indeed, we live and act on the basis of fetishism: "the ordinary consciousness of the agents of production themselves" determines their actions, so that it is prices and profits — not values or surplus value — that play a role in determining behaviour (Marx 1967c:25).

4. *Profit distribution.* Price-value differences lead to a distribution of profits to individual capitalists that is typically out of proportion to the surplus value produced by their workers. The key ecologically relevant issue of such profit distribution is that of land rent: income received from the ownership of a "piece of nature." To understand this, consider in greater detail deviation between prices and values and rents. This deviation involves three steps.

First, as seen in the so-called "transformation problem," prices of production (long-run equilibrium prices when capital moves easily between sectors) differ from values due to interindustry competition. Capital mobility between sectors causes prices of production to differ from values when (a) different sectors use varying technologies ("compositions of capital"); (b) the rate of surplus value is positive; (c) labour mobility tends to equalize the rate of surplus value between sectors; and (d) capitalists want to receive profits in money terms (instead of in value), in proportion to their money capital invested. All of these conditions normally apply under capitalism: therefore values and prices of production typically diverge.

Here we will ignore the deviation between production-price and value, so that the relative magnitude of values can affect individual behaviour by changing prices. The composition of capital is thus assumed uniform and positive across sectors, so that attribute (a) is denied. Attributes (b), (c), and (d) will be accepted as true. In fact,

rates of surplus value are assumed to be totally equalized, exaggerating attribute (c). Together these form assumption A3.

This very high-level abstraction means that the existence of Marx's "absolute rent" is ruled out. The theory of absolute rent is controversial, while it applies best to countries that are not fully capitalist. Thus it is no loss to drop this type of rent in the present context.²⁰ In any event, it seems to have implications quite similar to that of monopoly rent.

In the second step, *market* prices (actual, empirical prices) differ from prices of production, the "centres of gravity" for market-price fluctuations. Such occurs whenever profit rates are prevented from equalizing between sectors, whether temporarily or permanently. Capitalism is a dynamic system with all sorts of strains, and frictions, and is typically in disequilibrium, so we should rarely see market prices equal to prices of production (which equal market values by assumption).

In this case, capitalists can claim profits differing from the amount of surplus value produced by their workers because of barriers to entry that prevent equalization of the profit rate between sectors, leading to prices being realized above the prices of production. When a capitalist benefits from (relatively) permanent barriers to entry, monopoly profits are appropriated. Here our concern is *monopoly rent*: the owner of a "piece of nature" gets a profit because of barriers to entry into his or her field implies the existence of a vested interest in maintaining nature, in keeping further capitalist accumulation out: the holder of a piece of nature does not want further competition which only drives down prices and profits. One can see this in the existence of private nature reserves and parks. In Marx's view, however, the normal process of capitalist development tends to abolish monopoly rent; after all such rent creates an incentive to discover ways to enter. But new monopolies can and do arise, as capital is concentrated and centralized, so this type of nature-preserving rent cannot be dismissed completely. It does seem unlikely, however as market relations become increasingly dominant. Such nature reserves are increasingly the realm of state and other non-profit-seeking organizations.

If the monopoly rent is not perceived as permanent, the result changes. With such transitory rents, the incentive exists to exploit nature as intensively as possible. For example, when the Israelis knew that they were going to be abandoning most of the Sinai peninsula to Egypt, they sped up production from the wells to drain the ground of as much petroleum as possible. The way in which the dynamics of

capitalism keep on threatening established monopoly and oligopoly positions (especially since the 1970s, with the globalization of capitalism) suggests that this story of transitory monopoly is increasingly more relevant than the ecology-friendly theory of permanent monopoly.

The next kind of rent, or the third step, does not presume the existence of monopoly in the usual sense of that word (limits to entry to a product market), but is instead based on yet another deviation in value theory, between individual and market value and their price equivalents. A capitalist can have a special advantage compared to others in the market and so receives differential rent because a product's individual value differs from its market value. The labour-hours necessary to produce the commodity in an individual workplace can be lower than the average for the industry as a whole, that is, the socially necessary abstract labour-time needed. From a societal viewpoint, a worker who gets the job done faster does not produce less value: a low "individual value" is not the same as low market value. Rather, it is the average labour-time in the market that determines the market value of the commodity (or, in short, its value). The difference between the individual value and the value is differential rent. Given A3, the individual production cost marked up with the society's average profit rate (a notional price reflecting individual value) differs from the price of production while the low-internal-cost company receive differential rent in the form of an above-average profit rate.

Ownership of an especially fertile "piece of nature" can lower the private labour-time necessary to produce a commodity below the social average; and thus the individual value below the market value: a worker maintaining a water wheel on the fall line of a river used to power a grain-mill is more productive than one using a hand-mill, because of the gift from nature. The owner of the piece of nature (access to the river) receives the equivalent of the market value in income, even though the production has a lower internal cost than that. Value exceeds individual value except for the highest cost (highest individual value) producer. The difference is differential rent.

There are two subcases of differential rent:

i) *Differential rent I* (Ricardian): the owner of a "piece of nature" gets a profit due to a "free gift" from nature, which raises labour productivity and allows an above-average profit rate. In this case, there exists an incentive to exploit the resource as intensively as possible. The capitalist seems to be receiving a "free lunch" from nature, and so rushes to use it and acquire as many free lunches as possible

before others can do so. There is an incentive to harvest fish and cetaceans from the ocean as much as one can. This easily becomes a feeding frenzy, as with gold rushes and destruction of the rain forests (or a combination of the two, as in Brazil).

ii) *Differential rent II* (technological): this rent results from investment, which raises the soil's (nature's) yield to the capitalist. Because there is an investment cost, there is no rush of the sort implied by differential rent I. But normal capitalist competition (the expand-or-die drive) implies a hustle to get this type of rent: a business that falls behind in competition (by not investing) would lose out and fall into the fringe of bankrupt companies, overworked petty bourgeois, or out of the capitalist class altogether.²¹ This push would be intensified where investment allows capitalists to find and tap "differential rent I." For example, one drills for oil in hopes of "hitting the jackpot." The possibility of so doing encourages this type of investment.

These microeconomic generalizations are not totally unfamiliar. What is different about the Marxian view arises from their role in the totality of capitalist society.

5. *Macrosocietal Links*. Unbeknownst to most of its participants, capitalist production represents a unified social system of production. In short, though it does not seem so to individual participants, production is (latently) socialized. The socialization of production is represented by values, while appropriation of the product is done through prices. In Marx, there are some basic "conservation principles" that link values and prices on the aggregate level. Following the so-called "new solution" to the transformation problem (cf. Devine 1990), and assumptions A1 and A2:

A. the total realized value of the aggregate product (net of intermediate costs and depreciation) = the total realized price of that product.

B. total surplus value realized = total realized profit.

These are hardly the only "macrosocietal links" in Marx's *Capital* (consider his reproduction schemes of volume II), but are the major ones as far as price-value relations are concerned.²²

By conditions A and B, individual profit claims that exceed surplus value production (i.e., the rents discussed above) represent a redistribution from those capitalists who are unable to claim profits as high as their capital's surplus value production. During a given Week, we see a fixed supply of labour power, a fixed level of labour

productivity and intensity, and a specific state of class relations, so a fixed amount of surplus value exists to be distributed among capitalists. Rents — whether monopoly or differential — therefore represent a deduction from this pool: *ceteris paribus*, industrial, commercial, and banking profits are hurt to the extent that rents rise. For monopoly rent, a barrier to entry that keeps profits in a sector above the average for the society is also a barrier to exit from other industries, which keeps their profit rates below average. In the case of differential rent, however, there is a similar result. The above-average profit rate of the mill with access to the river corresponds to a below-average profit rate for the mill without such advantages.

The redistribution pushes non-rent-earning capitalists to either squeeze labour more or try to get rents for themselves (by grabbing pieces of nature) or to do both. They do not necessarily follow a strategy that raises aggregate surplus value, since they do not understand the conditions necessary for its production. The second option is one more factor impelling capitalism to be aggressive towards the environment. While it is true that such an invasion tends to make monopoly rents disappear, the transitory rents earned from invasion are usually sufficient motivation. After all, they can be capitalized and thus used as a basis for further appropriation of income and accumulation of capital. The first option — attacking the working class — is common enough, but as with invading nature, it has its costs and risks. So capitalists are encouraged to pursue a diversified strategy. That is, the competition among capitalists promotes attacks on both nature and labour. To the extent that it is difficult to abuse nature, labour will be attacked, and vice versa.

6. *Dynamics.* This competition is by its very nature dynamic, so we must get beyond a single Week. The issue of laws of motion brings up two contradictions noted above. First, as discussed in Part 1, a contradiction exists between use-value and exchange-value. Commodity sellers are not concerned with the use-value of commodities except to the extent to which selling them earns the sellers exchange-value, or price. This is amplified under capitalism: capitalists are concerned with getting as much profit as possible, with use-value a secondary concern at best. Unlike in the neoclassical vision in which "externalities happen" typically for technical reasons and capitalists respond passively, profit maximization means that "external costs are created."²³ Commodity production involves the active effort to find ways to externalize internal costs. E.K. Hunt (1980) calls this phenom-

enon the "Invisible Foot": in a reversal of Smith's Invisible Hand, the self-interested actions of individuals maximizes the "illth" of nations — and of nature. This also means that capitalists are constantly trying to internalize external benefits. This — the growth of corporations' non-marketized or internal operations — is one factor encouraging the overt socialization of production.

This first contradiction might be seen as being one of capitalism versus humanity and/or nature; the second, related, contradiction is within the capitalist class: as discussed in Part 5, a contradiction exists between socialized production as represented by values and surplus value and individual appropriation as reflected in prices and profits. Even though the production of surplus value depends on certain conditions existing at the societal level (class relations), capitalists appropriate profits as individuals. They do not act on values or surplus values (which are not even perceived) but on the microcategories of prices and profits. They act on the basis of commodity fetishism, and thus fight over the distribution of a pool of surplus value that is fixed in magnitude during any Week. Unbeknownst to individuals, the effort to get rents is a "zero-sum game" on a macrosocietal level. Each capitalist's success at gaining a special advantage and resultant rents (or quasi-rents) is at the expense of other capitalists.

Given these possible conditions necessary for the exploitation of labour, in parallel, we must also posit some sort of notional conditions for harmony between a society and nature. Just as with the conditions for successful exploitation, individual capitalists do not act in terms that automatically maintain harmony. Instead, they act simply for themselves, pushed by the expand-or-die imperative. The conflict between capitalism's drive and the conditions necessary for harmony with nature define the "ecological crisis" under capitalism.

In more poetic terms, capitalist competition is like that of professional weightlifters. In the absence of central constraints, each of the athletes invests in anabolic steroids in order to gain a relative advantage. Those who do not take the drug increasingly find that they are losing to those who do; and they must choose to either join in drug abuse or lose the game. In the end, most of the advantage gained by the weaker athletes is lost when the stronger also start taking steroids. Given the negative side-effects of steroids, this competition is self-destructive — both to the group and the individuals (cf. Hoberman 1991).

An alternative to environmental devastation would be the development of technology that raises the productivity of labour by the

application of newly discovered science and technology. (For example, companies could save on labour, thanks to the invention of "window envelopes," which avoid the problem of sending the wrong letter to recipients of large mailings of bills and the like.) *Ceteris paribus*, this boosts the profit rate, without causing significant pollution. But as long as nature offers the "free lunch" of "differential rent I", there is an incentive for an individual capitalist to follow a diversified strategy, combining the abuse of the environment and the use of such harmless technical change. (Just as the weightlifters take drugs and exercise, the window envelopes have plastic in their windows.) This is encouraged by a long history of "successful" abuse of nature as in the United States, where the natural limits on capitalist accumulation were reached only recently. The habit of nature-beating is hard to break, especially when institutionalized. Even where environmental destruction tends to destroy the supply of natural "free lunches," new technology can inadvertently encourage the expansion of that supply. For example, the development of computer technology (which is not in itself destructive to nature) has encouraged the demand for minerals that must be mined from the ground.

This vision of a dynamic market process suggests that the mainstream debate between those who advocate the creation of artificial markets to fight externalities by selling licences to pollute and those favouring regulatory "command and control" techniques is beside the point. No matter what the method of control, individual firms would struggle to find ways to mine loopholes in the law, to develop new ways to externalize internal costs, to influence legislators in their favour, and to move internationally to find pliable Third World governments willing to accept pollution (for a bribe or for promises of "jobs"). These mainstream proposals ignore the fact that capitalism is a "moving target," always changing its forms and locations of environmental destruction. For example, if hydrocarbon emissions are severely restricted (to fight global warming), new types of pollution will be invented.

The advance of the capitalist juggernaut indicates that major changes are in the making. One can posit two main options for long-term trends: a drastic collapse and increasingly overt socialization of production. Within these two options of course, there are variations.

First, the environmental crisis could drastically undermine the worldwide ability to produce wealth. This would destroy not only capitalism but also the possibilities for socialism. Global warming,

inadequate supplies of oxygen, epidemics of skin cancer, environmentally induced weakening of individuals' auto-immune systems, and similar problems could impose a universal poverty that would rule out the abundance that Marx saw as necessary to allow socialism to be realized. Marx did not foresee this problem, which would prevent the realization of socialist goals, not to mention the goals of feminists, anti-racists, and other progressive forces. This is an environmentalist version of Rosa Luxemburg's "socialism or barbarism": the abolition of capitalism and the establishment of socialism are seen as necessary to save the earth.

This disaster may not be realized because the steady increase in environmental costs will begin to feed back to squeeze profits, slowing down accumulation and creating stagnation before the environmental Armageddon is reached. Just as over-fishing eventually destroys the supply of fish and hurts the fishers, so too does excessive pollution hurt the capitalists. Raw material prices would rise, along with maintenance costs: the smog in Athens does not simply destroy the Parthenon, all other buildings must be painted more often. On top of this, pollution raises the workers' cost of living, as clean water and air become more expensive and environment-related health problems grow. An increased cost of reproduction of labour power would bring workers to push more intensively for higher wages. This may not result in higher wages, because the outcome of such wage struggles cannot be determined ahead of time. Class antagonisms would be heightened, although they might not be manifested as overt class struggle but as social alienation: instead of encouraging them to blame the system or their bosses, a decline in living standards can push workers to punish their spouses, their children, their neighbours, other ethnic groups, or themselves (with alcohol and drug addiction). It is possible, however, that wages would rise for another reason: pollution can decrease the world supply of labour power as environmental pollution makes people more prone to plagues. The result would be higher wages for the survivors, as with the Great Plague of the fourteenth century. This can squeeze profits (just as the lords' rents fell after the Plague).

In this kind of pollution crisis, the pressure for government-organized programs of pollution clean-up and medical services becomes stronger. This reduces the supply of labour power available to the commodity-producing (and capitalist) sector, encouraging wages to rise. It also means more taxes, which come either directly out of profits or out of wages. In the case of taxation on wages, which capitalists would prefer, workers require a greater pre-tax wage just

to maintain the same standard of living. As before, this does not automatically mean higher wages, but it might encourage greater class antagonism. Either way, there is a tendency for profits to be squeezed by environmental destruction. This squeeze is shown indirectly in the increasing cost of keeping the effects of environmental ruin out of the homes and playgrounds of the rich.

The first option of the progressive raping of nature directly reflects the contradiction between use-value and exchange-value, feeding back to contradict the long-term interests of the capitalist class: the capitalists foul their own very large nest, in which we are all forced to live. The second option arises as efforts are made to reconcile contradictions within the capitalist class: the more farsighted sectors of that class such as the Trilateral Commission) push to prevent the long-term effects, just as the athletic associations strive to restrain the weightlifters. State intervention on a world scale may be encouraged — as in the rules against the use of CFCs and in the abortive "Law of the Sea." These initiatives seem unlikely to be successful, given the division of the world system into competing nation-states and the hegemonic rule of *laissez-faire* ideology in recent years. Encouraging this competition is the increasing ability of transnational corporations to "whipsaw," that is, to get localities to fight for the jobs and other benefits arising from investment. The transnationals can induce governments to compete to weaken anti-pollution laws.

But if environmental costs are beginning to squeeze profits, one can imagine that worldwide anti-pollution efforts might be instituted, as part of some sort of world government. In the limit, one could imagine that all beneficial externalities would end up being internalized by businesses — just as the city square has become the enclosed and air-conditioned shopping mall — and all costs externalized and put under government aegis. In this scenario, all wild animals that could live in zoos would be there or in state-owned nature reserves. Some might be in amusement parks, as with the dolphin shows at various "sea worlds."

This option is one where the latent socialization of capitalist production has become overt and institutionalized. The distribution of many costs and benefits would have been exempted from the fetishism of commodities, as production has become increasingly de-commodified. Such socialization thus becomes politicized and conflictual: competition among capitalists produces commodity fetishism and moderates class struggles (since few workers see the societal nature of the capitalist system), but to the extent that total overt

socialization is attained, these illusions become attenuated. If this trend is realized, the unified and socialized nature of the system becomes obvious, and people can more successfully fight for democratic control over the degree and form of socialization. The capitalists would attempt to push the costs of socialization onto workers, while workers and their allies would push to control the terms of socialization and to avoid paying these costs. Threats of this kind of conflict may prevent the establishment of world environmental controls. Alternatively, the world government may find itself forced to utilize authoritarian means to maintain its power.

This move towards the "total overt socialization" option does not necessarily cure the environmental problem, unless the capitals are combined and centralized to a large degree: the active externalization of internal costs is integral to capitalist competition, while there is always an incentive for individual capitalists to become free riders, to pollute even though it conflicts with the elite-defined "public interest." This suggests that total socialization would involve a merger of the state and capital — a merger hardly sufficient to deal with the environmental crisis. Many Third World "state capitalist" governments have abused the environment in an extreme way. Similarly, in Eastern Europe the old Stalinist governments — which merged the state and capital in a different way — imitated capitalism's abuse of the environment. In their desperation to catch up with advanced capitalism, they often polluted to a greater extent than did capitalism.

Given the competition among capitals and resistance to politicization, the most likely result is uneven development on a world scale. In some areas (the Third World, the former Stalinist nations), the environmental cataclysm would dominate. The total socialization option is most likely to occur in the richer nations, but socialization cannot be total if limited to some areas: even the rich areas suffer from the pollution created by the poorer zones, while "unfair competition" from the areas where costs are more likely to be externalized will undermine the anti-pollution efforts of the richer nations. This encourages harmonization downward, as Third World pollution standards become general. On a smaller level, this is threatened as a result of the North American Free Trade Agreement, in which Mexico's low standards will be slowly generalized and extended to all of North America.

This discussion suggests that there is no automatic tendency for the "laws of motion" of capitalism to cure the environmental catastrophe. Instead, a strong and active international environmentalist

movement is the best cure for environmental problems, at least in the short run. This movement would be most effective with a working-class base: that class receives the brunt of pollution's effects and the "jobs versus environment" clash must be addressed in order to actually battle the environmental disaster. Such movements can fight to set the terms of future overt socialization of production. Ultimately, this involves the establishment of a democratic socialism — a non-capitalist system that abuses neither nature nor labour.

Conclusion

Marx's Labour Theory of Value, then, is indeed relevant to environmental problems. I will leave to the reader the task of answering the question as to whether the application of the value heuristic has actually added anything new to the ecological literature: is there nothing new under the smog?

Given the abstract level of the discussion here, there are many stones left unturned and questions unasked. I have considered issues of gender, ethnicity, imperialism, and even class relations in only the most superficial way, if at all. Thus, this article can only serve as a prelude to further research and analysis.

Notes

1. An earlier version of this paper was presented at a Union for Radical Political Economics session at the Allied Social Sciences Associations convention, New Orleans, January 3, 1992. Thanks to Ted McGlone and the other discussants for their useful comments. Of course, all high crimes and misdemeanours are my own.

2. Thus, I do not summarize her broadside except to note that her paper summarizes one Sraffian perspective and in some ways mirrors a feminist critique of Marxism.

3. This is far from the first Marxist article on the environment. See, for example, articles by Katherine Yih's and John Bellamy Foster's articles in *Monthly Review*. See also many articles in the journal *Capitalism, Nature, Socialism*; especially O'Connor (1988).

4. I embrace Georg Lukács's (1971) view that Marxism (or "orthodox Marxism") refers to a method of analysis (a set of questions) rather than a pre-determined array of answers (a dogma). I thus differ from the "analytical Marxist" school, of Roemer et al., which sees "Marxism" as a set of substantive claims about the world that are independent of methodology, a dogma that can be confronted by facts and logic in a simple way.

5. As Ted McGlone points out, it is strange to invoke both the dialectical Lukács and the semi-positivist Lakatos. However, in a dialectical manner, I aim to understand Marxian political economy by looking at it not only from the inside (Lukács) but also from the outside (Lakatos).

6. "Use-value" refers to the possible utility that a commodity's properties can provide. Value refers to the socially necessary abstract labour-time ("Snalt") necessary to produce it. Exchange value refers to the form of appearance of value, in exchange (in prices and the like).

7. Pecuniary externalities include (for example) the impact of a factory closing on the profits of small business in its town. That this phenomenon gets so little emphasis in the economics literature (it hardly showed up in my informal survey of microeconomics textbooks) reveals an ideological bias.

8. The "societal standards" here refers to the determination of a commodity's value by the average labour needed to produce it in its industry rather than by the labour "embodied" in the good (its individual value).

9. This contradiction has a long tradition in the socialist and Marxist traditions (socialism has been defined as "production for use rather than for exchange"). It does not show up explicitly in *Capital*, but can be seen in the contradiction between the value of labour power and its use-value (the production of surplus value).

10. This lead has been followed by several authors since then; Miller (1990) provides a survey with a focus on environmental issues.

11. In terms of the "new solution to the transformation problem" (cf. Devine 1990), there is a relatively simple relationship between GDP and the aggregate product in value terms. See conservation principle A.

12. In fact, existing measures of GDP should be purified to make them better measures of business activity through the market. Currently, various countries attempt to have GDP to measure use-values in some cases. For example, the imputed rent on owner-occupied houses, though important to NEW, should not be counted in GDP (Keynesian analysis agrees here: a measure of monetary exchanges is better if the issue is aggregate demand). Marglin (1984:chs. 17-18) applies this view when testing alternative theories of saving.

13. The key problem here is how to add up qualitatively different use-values. One problem is that the Tobin-Nordhaus NEW uses prices for weighting both marketed and non-marketed goods. Thus it reflects, rather than transcends, capitalist class relations. Using values as weights would have the same effect since, as noted, they do not include the cost of the mess created by externalities. For aggregation, an accurate NEW would use shadow prices representing social costs and benefits. These may be impossible to calculate unless the system is organized along socialist lines. See Albert and Hahnel

(1991a:ch.4; 1991b) for one scheme for such calculation. Nonetheless, NEW-type measures are useful wake-up calls for those bemused by GDP.

14. The concept of a "Week" is used to express the diachronic versus synchronic (time-series vs. cross-section) distinction applied to the LoV in Devine (1990). It is not the same as the standard "short run." Rather, a "Week" refers to different processes happening "at the same time."

15. The same can be said for the household. It was assumed (A1) that household labour does not produce surplus value. But this does not mean that household labour should be seen as ethically or empirically unimportant to socialists or even to capitalists. After all, that labour does produce use-values that are quite important, indeed totally necessary to human existence as sane and sentient beings.

16. Although I doubt the usefulness of the concept of "unproductive labour" even from the point of view of analysing capitalism, that issue is beyond the scope of this paper. For one useful survey of this subject, see Gough (1975). As Lebowitz (1992:100-103) makes clear, this concept should be utilized with a contrasting concept of "productive for the workers" or "productive for humanity."

17. As noted, Marx used values to cut through the fetishism of commodities to reveal the social nature of production. In the first two volumes of *Capital*, he assumed that value=price in order to sketch the relationships between "capital in general" and "wage labour in general." In the second volume, he used it to illuminate macrorelations within the capitalist class, without however introducing the full-scale competition of "many capitals." In the third volume he introduces this competition and, with it, price-value deviations. In his unwritten book on wage labour (cf. Lebowitz 1992), he would have considered relations within the working class.

18. It is also true of unique art objects and antiques, because they are impossible to reproduce "[o]bjects that in themselves are not commodities, such as conscience, honor, &c., are capable of being offered for sale by the holders, and thus acquiring, through their price, the form of commodities. Hence an object may have a price without having value" (Marx 1967a:102). Marx goes on to mention uncultivated land, which has a price but no value "because no human labour has been incorporated in it."

19. To a growing extent, air has a positive price: for example; in the smog belt in Los Angeles we pay for air conditioning not only as a way to "beat the heat" but to filter the air. One can allegedly purchase air from vending machines in Tokyo.

20. The existence of absolute rent presumes that the agricultural sector has a lower composition of capital than does industry and that the mobility of capital into agriculture is blocked. For some surveys on Marx's theory of

rent, see Murray (1977) and Fine (1986).

21. This Marxian vision of competition (cf. Marx 1949-section 5) is similar to that of the Austrian school and Schumpeter (but not that of neoclassical or Sraffian theory), in that competition is seen as a dynamic process of battling capitals using any means necessary to jockey for position. It differs from the Austrians and Schumpeter in not idealizing entrepreneurs as demigods (somehow exogenous to the process) and innovation as necessarily good.

22. Marx also assumes that the value-profit-rate = the price-profit-rate. This condition requires too many assumptions to be useful. In fact, the concept of value-profit-rate seems dubious in the LoV, since profit is a price category. When considering value relations, Marx focuses on the rate of surplus value, which is appropriate given the LoV's role in revealing class relations.

23. It is standard in neoclassical economics to assert that the externalization of costs leads to lower internal costs, which in turn lead to lower prices to consumers, so that consumers benefit from pollution. This can be true (in a limited sense, since consumers suffer from the maiming of nature) but ignores the fact that the process takes time, thus ignoring also the existence of transitory profits that give capitalists the incentive to actively seek out polluting technologies and other new ways to abuse nature. Needless to say, it also assumes the utopia of perfect competition, in which no "firm" has any power, even temporary.

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