

6 Marx's *Grundrisse* and the ecological contradictions of capitalism

John Bellamy Foster

Introduction

In *The Eighteenth Brumaire of Louis Bonaparte* Marx famously wrote: 'Men make their own history, but they do not make it just as they please; they do not make it under circumstances chosen by themselves, but under circumstances directly encountered, given and transmitted from the past' (Marx 1979: 103). The material circumstances or conditions that he was referring to here were the product of both natural and social history. For Marx production was a realm of expanding needs and powers. But it was subject at all times to material limits imposed by nature. It was the tragedy of capital that its narrow logic propelled it in an unrelenting assault on both these natural limits and the new social needs that it brought into being. By constantly revolutionizing production capital transformed society, but only by continually alienating natural necessity (conditions of sustainability and reproduction) and human needs.

Recent research has revealed that an ecological–materialist critique was embedded in all of Marx's work from *The Economic and Philosophical Manuscripts* of 1844 to his *Ethnological Notebooks* of the late 1870s to early 1880s (see Burkett 1999; Foster 2000; Dickens 2004). This can be seen in his materialist conception of nature and history, his theory of alienation (which encompassed the alienation of nature), his understanding of the labour and production process as the metabolic relation between humanity and nature, and his co-evolutionary approach to society–nature relations.

Nevertheless, because Marx's overall critique of political economy remained unfinished, these and other aspects of his larger materialist conception of nature and history were incompletely developed – even in those works, such as *Capital*, volume 1, published in his lifetime. Moreover, the relation of his developed political–economic critique in *Capital* to the wider corpus of his work was left unclear. The *Grundrisse* has therefore become an indispensable means of unifying Marx's overall analysis. It not only stands chronologically between his early writings and *Capital*, but also constitutes a conceptual bridge between the two. At the same time it provides a theoretical–philosophical viewpoint that is in some ways wider in scope than any of his other works.

The form of the *Grundrisse* – the fact that Marx composed it as a set of notebooks primarily for his own self-edification in preparation for his critique of political economy – has made it a difficult work to interpret. One way to understand his general theoretical approach is in terms of the relation between ‘production in general’ – a conceptual category introduced in the opening pages of the *Grundrisse*, originally conceived as the basis of its ‘first section’ (Marx 1973: 320) – and specific historical modes of production. The latter included pre-capitalist economic formations and capitalism’s immediate historical pre-supposition, i.e. primitive accumulation – together with capitalism proper.

Marx used the concept of production in general as a basis from which to develop his general theory of needs, which encompassed both natural prerequisites and historic developments – the production of new needs manifested in new use values. It was the conflict between production in general (as represented by use value) and specifically capitalist production (as represented by exchange value) that pointed to capitalism’s historical limits and necessary transcendence. A crucial part of the argument in the *Grundrisse* was the distinction between this approach to nature–society and that of Malthus.

The nature–society or ecological dialectic embodied in the *Grundrisse* can thus be seen in terms of five interrelated realms:

- 1 the attempt to construct a materialist critique encompassing both production in general and its specific historical forms;
- 2 the articulation of a theory of human needs in relation to both society and nature – pointing beyond the capital relation;
- 3 the analysis of pre-capitalist economic formations and the dissolution of these forms through primitive accumulation, representing changing forms of the appropriation of nature through production;
- 4 the question of external barriers/boundaries to capital; and
- 5 the confrontation with Malthus on population and the earth.

Production in general and natural–historical materialism

The starting point for Marx’s critical ontology in the *Grundrisse* was that of production in general. Production in the most concrete sense was always historically specific, i.e. production at a definite stage of social development. Nevertheless, an understanding of these specific forms gave rise to a more general, abstract conception, that of the ‘production process in general, such as is common to all social conditions, that is, without historic character’ (Marx 1973: 320). ‘All epochs of production’, Marx wrote,

have certain common traits, common characteristics. *Production in general* is an abstraction, but a rational abstraction in so far as it really brings out and fixes the common element and thus saves us repetition. . . . For example. No production possible without an instrument of production, even if this instrument is only the hand. No production without stored-up, past labour,

even if it is only the facility gathered together and concentrated in the hand of the savage by repeated practice.

(Marx 1973: 85–6)

Production in general in Marx's analysis was tied to the production of use values. Use value 'presupposed matter,' and constituted the 'natural particularity' associated with a given human product. It existed 'even in simple exchange or barter'. It constituted the 'natural limit of the commodity' within capitalist production – the manifestation of production in general as opposed to specifically capitalist production (Marx 1973: 267–8).

Closely related to production in general, was labour in general. 'Labour,' Marx wrote in *Capital*,

is, first of all, a process . . . by which man through his own actions, mediates, regulates and controls the metabolism between himself and nature. . . . It [the labor process] is the universal condition for the metabolic interaction [*Stoffwechsel*] between man and nature, the everlasting nature-imposed condition of human existence.

(Marx 1996: 187, 194; translation according to Marx 1976: 283, 290)¹

This approach to nature and production first appeared in the *Grundrisse*, where Marx discussed the metabolic 'change in matter [*Stoffwechsel*]' associated with 'newly created use value' (Marx 1973: 667). Just as this metabolic relation constituted the universal condition defining production, so the alienation of this metabolism was the most general expression of both human alienation and alienation from nature, which had its highest form in bourgeois society. As Marx explained:

It is not the *unity* of living and active humanity with the natural, inorganic conditions of their metabolic exchange with nature, and hence their appropriation of nature, which requires explanation or is the result of a historic process, but rather the *separation* between these inorganic conditions of human existence and this active existence, a separation which is completely posited only in the relation of wage labor and capital.

(Marx 1973: 489)

It was the historical alienation of human beings from nature under capitalist production rather than their unity in production in general that therefore required critical analysis.

Here Marx was building on an earlier materialist–dialectical conception presented in his 1844 *Economic and Philosophical Manuscripts*, where he had written that:

Nature is man's *inorganic body* – that is, insofar as it is not itself human body. Man *lives* on nature – means that nature is his *body*, with which he

must remain in continuous interchange if he is not to die. That man's physical and spiritual life is linked to nature means simply that nature is linked to itself, for man is a part of nature.

(Marx 1975: 276)

This dialectic of organic–inorganic relations was derived from Hegel's *Philosophy of Nature* and was rooted ultimately in ancient Greek philosophy. In this context organic meant pertaining to organs; inorganic referred to nature beyond human (or animal) organs; the 'inorganic body of man' to the extension of the human body by means of tools. (The Greek *organon* encompassed both organs and tools; seeing the former as 'grown-on' forms of the latter, whereas tools were the artificial organs of human beings.) 'In its outwardly oriented articulation', Hegel wrote, 'it [the animal] is a production mediated by its inorganic nature' (Hegel 1970: vol. 3, 185; Foster and Burkett 2000).

In the *Economic and Philosophical Manuscripts* Marx gave this a more materialist reading, arguing that:

the life of the species, both in man and in animals, consists physically in the fact that man (like the animal) lives on inorganic nature; and the more universal man (or the animal) is, the more universal is the sphere of inorganic nature on which he lives.

(Marx 1975: 275)

This was carried forward into the *Grundrisse* where he referred to 'the natural conditions of labour and of reproduction' as 'the objective, nature-given inorganic body' of human subjectivity. 'The earth', he stipulated, is 'the inorganic nature of the living individual.... Just as the working subject appears naturally as an individual, as natural being – so does the first objective condition of his labour appear as nature, earth, as his inorganic body' (Marx 1973: 474, 488).²

The *Grundrisse* is full of acknowledgements of nature's limits, natural necessity, and the co-evolution of nature and society. The planet itself had evolved, taking on new emergent forms, so that the 'processes by means of which the earth made the transition from a liquid sea of fire and vapour to its present form now lie beyond its life as finished earth' (Marx 1973: 460). With the development of industrialized agriculture, Marx argued – foreshadowing his analysis of the metabolic rift in *Capital* – 'agriculture no longer finds the natural conditions of its own production within itself, naturally, arisen, spontaneous, and ready to hand, but these exist as an independent industry separate from it'. It now requires external inputs, such as 'chemical fertilizers acquired through exchange', the importation of Peruvian guano, 'seeds from different countries, etc.' In this sense a rift had been created in the natural metabolism (Marx 1973: 527).³

The theory of needs and the transcendence of capital

There was in Marx's view no exclusively natural character to human needs and identity. But there were nevertheless natural prerequisites to human existence, and a natural substratum to production in general. 'Use value', he wrote, is the 'object of ... satisfaction of any system whatever of human needs. This is its [wealth's] material side, which the most disparate epochs of production may have in common' (Marx 1973: 881). Hence all commodity production necessarily consisted of use value as well as exchange value. The natural prerequisites of production, embodied in use values, could be transformed but not entirely transcended through human production. Human needs, 'scant in the beginning', were, in their specifically human character, historically changing needs, developing 'only with the forces of production', erected on top of this natural substratum (Marx 1973: 612). New needs were produced through the continual transformation of both the human relation to nature and of human beings to each other – and hence of human species being. The development of production was therefore nothing but the historical development of human needs and powers in interaction with nature.

Not only do the objective conditions change in the act of reproduction, e.g. the village becomes a town, the wilderness a cleared field etc., but the producers change, too, in that they bring out new qualities in themselves, develop themselves in production, transform themselves, develop new powers and ideas, new modes of intercourse, new needs and new language.

(Marx 1973: 494; see also Lebowitz 2003: 30–2)

Neither natural history nor social history could be conceived as static; each was complex and forever changing, embodying contingent, emergent, and irreversible aspects, and above all interconnectedness (see Foster 2000). The metabolic relation between human beings and nature was thus necessarily a co-evolving one, in which the dependence of human beings on nature was an insurmountable material fact. Moreover, the future depended on the *dynamic sustainability* of this historically changing relation, in forms that provided for 'the chain of successive generations' (Marx 1998: 799).

This outlook was integral to Marx's materialist conception of nature and history as developed in his work in his work as a whole. In the *German Ideology* Marx and Engels observed that:

the first premise of all human history is, of course, the existence of living human individuals. Thus the first fact to be established is the physical organisation of these individuals and their consequent relation to the rest of nature.... All historical writing must set out from these natural bases and their modification in the course of history through the action of men.

From such natural prerequisites of history, Marx and Engels proceeded to human history proper: production, as the specifically human relation to nature,

was not only the mere satisfaction of needs but the creation at the same time of new needs. (Marx and Engels 1976: 31). These might be far removed from their original natural bases. ‘Hunger is hunger’, Marx observed in the *Grundrisse*, ‘but the hunger gratified by cooked meat eaten with a knife and fork is a different hunger from that which bolts down raw meat with the aid of hand, nail and tooth’ (Marx 1973: 92).

Under the regime of capital this dialectic of needs production became inverted, so that the production of use values, reflecting the fulfilment of old needs and the positing of new ones on natural foundations, existed only as a means not an end; while the pursuit of exchange value became the sole object of production. Capitalism created open, endless dissatisfaction, since the pursuit of exchange value as opposed to use value had no natural or social point of satisfaction, but led only to a drive/craving for more. Thus a treadmill of production was generated in which production appeared ‘as the aim of mankind and wealth as the aim of production’. This contrasted with the ‘loftier’ if still ‘childish world’ of the ancients, in which human satisfaction was still the object of production, albeit from ‘a limited standpoint’ (Marx 1973: 488).

In the alienated, upside-down world of capital, the dominant necessity driving all others was the unquenchable desire for abstract commodity wealth, which was nothing but the limitless desire for more commodity production. This meant that the original conditions of production – land and even human beings – became mere accessories to production. Generalized commodity production disrupted all original human–natural relations, all relations of sustainability and community, in the ceaseless drive for production for production’s sake, wealth for wealth’s sake. But ‘when the limited bourgeois form is stripped away’, Marx asked, ‘what is wealth other than the universality of individual needs, capacities, pleasures, productive forces, etc., created through universal exchange? The full development of human mastery over the forces of nature, those of so-called [external] nature as well as of humanity’s own nature?’ (Marx 1973: 488). Such ‘human mastery’ was of course not about the robbing of nature but the realization of a wealth of human needs and powers through human production, and not for a single generation, but for successive generations.

Pre-capitalist economic–ecological formations and primitive accumulation

Marx’s very detailed (to the extent then possible) treatment of pre-capitalist economic formations in the *Grundrisse*, was meant to lead into the analysis of capitalist development itself, as part of a general historical understanding. Hence that section of the *Grundrisse* had the heading: ‘Forms which Precede Capitalist Production (Concerning the process which precedes the formation of the capital relation or of original accumulation)’ (Marx 1973: 471). It was preceded by a section headed ‘Original Accumulation of Capital’.⁴ Moreover, the section on pre-capitalist forms ended with the reconsideration of the original, primitive accumulation of capital arising out of these historical precursors, making it clear

that the original basis for accumulation and capitalism's simultaneous dissolution of all earlier economic formations was the central issue here.⁵

The discussion of pre-capitalist economic formations focused on the communal nature of these formations (already substantially broken down in the class societies of the ancient and feudal worlds). Marx's analysis of 'original' or 'primitive' accumulation was thus concerned with the *dissolution* of these remaining communal and collective forms and the complete alienation of the land – providing the ground for the emergence of the modern proletariat and the self-propelling process of capital accumulation. As he wrote in *Capital*, 'private landownership, and thereby expropriation of the direct producers from the land – private landownership by the one, which implies lack of ownership by others – is *the basis of the capitalist mode of production*' (Marx 1998: 798, emphasis added). The main presupposition of capitalism was the dissolution of all previous connections to the land on the part of the direct producers. It was 'the historic dissolution of . . . naturally arisen communism' as well as 'a whole series of economic systems' separated from 'the modern world, in which exchange value dominates' (Marx 1973: 882).

The *Grundrisse* provided a trenchant analysis of these processes of dissolution. What was primarily at issue was the '*Dissolution of the relation to the earth – land and soil – as natural conditions of production – to which he [the human being] relates as to his own inorganic being*' (Marx 1973: 497). Living labour, which was originally connected to and in community with the land was now defined by the fact that the earth was the worker's 'not property', i.e. his (and her) 'not-landownership . . . the negation of the situation in which the working individual relates to land and soil, to the earth as his own'. This prior communal relation to the earth was now 'historically dissolved' in its entirety by capitalist relations of production (Marx 1973: 498–9). The forcible expropriation of the earth:

'clears,' as Stuart says, the land of its excess mouths, tears the children of the earth from the breast on which they were raised, and thus transforms labour on the soil itself, which appears by its nature as the direct wellspring of subsistence, into a mediated source of subsistence, a source purely dependent on social relations. . . . There can therefore be no doubt that *wage labour* in its *classic form*, as something permeating the entire expanse of society, which has replaced the very earth as the ground on which society stands, is initially created only by modern landed property, i.e. by landed property as a value created by capital itself.

(Marx 1973: 276–7)

The result was 'a dialectical inversion' in which property was entirely on the side of capital, establishing the right of property over alienated labour, which existed only for (and through) its exploitation (Marx 1973: 458). In this dissolution of the traditional relation to the land the labour force was 'released' as formally free labour power, without any recourse for survival except to offer itself

up for exploitation by capital. ‘In bourgeois economics’, Marx wrote, ‘this appears as a complete emptying-out . . . universal objectification *as total alienation*, and the tearing-down of all limited, one-sided aims as sacrifice of the human end-in-itself to an entirely external end’ (Marx 1973: 488, emphasis added).⁶

Barriers and boundaries: capital’s absolute limits

For Marx capital was self-expanding value, inseparable from accumulation. As he explained in the *Grundrisse*, ‘If capital increases from 100 to 1,000, then 1,000 is now the point of departure, from which the increase has to begin; the tenfold multiplication, by 1,000% counts for nothing’ (Marx 1973: 335; see also Mészáros 1995: 568). The increase, from whatever starting point, is all, since it is from this increase that profits are obtained.

This meant that capital had constantly to revolutionize its appropriation of both nature and human labour power. ‘Capital’, the *Grundrisse* stated,

is the endless and limitless drive to go beyond its limiting barriers. Every boundary is and has to be a barrier for it. Else it would cease to be capital – money as self-reproductive. If ever it perceived a certain boundary not as a barrier, but became comfortable with it as a boundary, it would itself have declined from exchange value to use value, from the general [abstract] form of wealth to a specific, substantial mode of the same. . . . The quantitative boundary of the surplus value appears to it as a mere natural barrier, as a necessity which it constantly tries to violate and beyond which it constantly seeks to go.

(Marx 1973: 334–5)

Here Marx was relying on the dialectical treatment in Hegel’s *Logic* of the nature of limits (barriers) to growth or expansion (Hegel 1969: 131–7; Hegel 1975: 136–7). A seeming absolute boundary that can be completely overcome is in reality a mere barrier. Nevertheless, capital’s ability to overcome all spatial and temporal, and all natural, limits, e.g. through the ‘annihilation of space by time’ – to treat these as mere barriers (rather than boundaries) to its own self-expansion – was more ideal than real, generating constantly expanding contradictions (Marx 1973: 539). In perhaps the most penetrating passage ever written on the dialectic of natural limits under capital, Marx stated in the *Grundrisse*:

Just as production founded on capital creates universal industriousness on one side . . . so does it create on the other side a system of general exploitation of the natural and human qualities, a system of general utility, utilising science itself just as much as all the physical and mental qualities, while there appears nothing *higher in itself*, nothing legitimate for itself, outside this circle of social production and exchange. Thus capital creates the bourgeois society, and the universal appropriation of nature as well as of the

social bond itself by the members of society. Hence the great civilizing influence of capital; its production of a stage of society in comparison to which all earlier ones appear as mere *local developments* of humanity and as *nature-idolatry*. For the first time, nature becomes purely an object for humankind, purely a matter of utility; ceases to be recognized as a power for itself; and the theoretical discovery of its autonomous laws appears merely as a ruse so as to subjugate it under human needs, whether as an object of consumption or as a means of production. In accord with this tendency, capital drives beyond national barriers and prejudices as much as beyond nature worship, as well all traditional, confined, complacent, encrusted satisfactions of present needs, and reproductions of old ways of life. It is destructive towards all of this, and constantly revolutionizes it, tearing down all the barriers which hem in the development of the forces of production, the expansion of needs, the all-sided development of production, and the exploitation and exchange of natural and mental forces. But from the fact that capital posits every such limit as a barrier and hence gets *ideally* beyond it, it does not by any means follow that it has *really* overcome it, and since every such barrier contradicts its character, its production moves in contradictions which are constantly overcome but just as constantly posited.

(Marx 1973: 409–10)

The juggernaut of capital therefore sees all of nature as a mere object, an external barrier to be beaten down, surmounted, or circumvented. Commenting on Bacon's (1993: 29, 43) maxim that 'nature is only overcome by obeying her' – on the basis of which Bacon proposed to 'subjugate' nature – Marx observed that for capitalism the discovery of nature's autonomous laws 'appears merely as a ruse so as to subjugate it under human needs'.⁷ He thus decried the one-sided, instrumental, exploitative relation to nature associated with contemporary social relations. Despite its clever 'ruse', capital is never able fully to transcend nature's limits, which continually reassert themselves with the result that 'production moves in contradictions which are constantly overcome but just as constantly posited'. No thinker in Marx's time, and perhaps no thinker up to our present day, has so brilliantly captured the dialectical complexity of the relationship between capitalism and nature.⁸

This argument takes on added significance for us today at a time when, as István Mészáros claims, we are witnessing 'the activation of capital's absolute limits' (see Mészáros 1995: 142). This takes various forms but is most apparent in the ecological realm. The problem, as Mészáros explains, is that 'neither the degradation of nature nor the pain of social devastation carries any meaning for its [capital's] system of social metabolic control when set against the absolute imperative of self-reproduction on an ever-extended scale' (Mészáros 1995: 173). All of this is inherent in the alienating character of capital, which is rooted in the alienation of the human metabolic relation to nature. 'Under the capitalist modality of metabolic exchange with nature', Mészáros writes, 'the *objectification*

of human powers necessarily assumes the form of *alienation* – subsuming productive activity itself under the power of a *reified objectivity*, capital’ (Mészáros 1995: 759). In the present age of planetary environmental crisis, capital is increasingly giving evidence of its ultimate ‘destructive uncontrollability’, imperilling civilization – or worse, life itself (Mészáros 2001: 61; Foster 2007: 2).

Sustainability in relation to the earth was a requirement of production in general, but one which capitalism was compelled to violate. As Marx explained in *Capital*, what was required from the standpoint of production in general was ‘a conscious and rational treatment of land as permanent communal property, as the inalienable condition for the existence and reproduction of the chain of human generations’. Instead capitalism brought ‘the exploitation and the squandering of the powers of the earth’. The problem came down to capitalism’s tendency to:

provoke an irreparable rift in the interdependent process of social metabolism, a metabolism prescribed by the natural laws of life itself. The result of this is a squandering of the vitality of the soil, which is carried by trade far beyond the bounds of a single country (Liebig).

(Marx 1998: 799; translation according to Marx 1981: 949)

Writing in the nineteenth century, Marx focused on the robbing of the soil of its nutrients, particularly nitrogen, phosphorus, and potassium, and the shipment of these often hundreds and thousands of miles, where, instead of being recirculated to the soil, they ended up as wastes polluting the air, water, and land (Marx 1998: 799). A ‘restoration’ of the nature–society ‘metabolism’, Marx argued, was therefore a historical requirement of production in general, but one which could only be fulfilled in a society of associated producers (Marx 1996: 505–8; translation according to Marx 1976: 636–9).

The ‘total alienation’ to which capitalist society pointed tended to pull the rug out from under it, creating ever greater conflicts between production in general and specifically capitalist production. Such a theory of *total alienation* (*Après moi le déluge!*) required as its negation a theory of total liberation: a revolutionary struggle to unleash human potential in ways that did not contradict the wealth of capacities that resided within all human beings and all generations, and that safeguarded the earth.⁹ The goal of production, Marx believed, should be ‘the cultivation of all the qualities of the social human being, production of the same in a form as rich as possible in needs, because rich in qualities and relations’ (Marx 1973: 409). Yet, this was a future that could only be materialized in a society in which the associated producers rationally controlled their metabolic relation to nature.

Malthus and overpopulation

The distinctiveness of Marx’s ecological materialism, when contrasted with the much more limited view of bourgeois political economy, was evident in his critique of Malthus, which took its sharpest most developed form in the *Grundrisse*. Marx’s foremost objection to Malthus was that he presented his population

law as a transhistorical imperative of human existence in general, applying equally to all types of society and taking only one form. In contrast, Marx, who was much more inclined to speak literally of ‘overpopulation’ than Malthus (whose strictly equilibrium model of population perpetually pressing on food supply, largely excluded any concept of overpopulation as such [see Foster 2000: 92–3]), saw this as related to production under specific historical conditions, and not inherent in production in general as Malthus supposed. As Marx stated in the *Grundrisse*, ‘in different modes of social production ... there are different laws of the increase of population and of overpopulation ... How small do the numbers which meant overpopulation for the Athenians appear to us!’ Malthus’ theory was guilty of abstracting

from these specific historic laws of the movement of population, which are indeed the history of the nature of humanity, the *natural* laws, but natural laws of humanity only at a specific historic development... Malthusian man, abstracted from historically developed man, exists only in his brain; hence also the geometric method of reproduction corresponding to this natural Malthusian man.

(Marx 1973: 604–6)

Malthus’ whole argument, Marx contended, rested on a logical sleight of hand. Malthus made the innate tendency toward a geometric rate of increase of human population into an iron law while treating those predominantly social–historical barriers that checked this growth as mere contingent factors. Conversely, the barriers that checked the growth of plants and animals were treated as absolute, overwhelming any natural tendency to geometric increase on their part, so that their rate of increase was at most arithmetic. Yet, Malthus in the end had no real explanation for his claim that plants and animals (the human food supply) could not also increase at a geometric rate, especially when helped along by the scientific techniques in agriculture. Nor was he able to explain why human beings were to be viewed as abstractly natural beings in this respect, rather than also social beings for whom population increase was historically conditioned.¹⁰

The truth was that conditions of human reproduction under capitalism had more to do with employment/unemployment and thus the question of relative surplus population (the reserve army of labour constantly reproduced by capital), than any inherent, natural law. Although Marx did not deny problems of population and food supply, he saw these, in contrast to Malthus, as socially constituted and went on to investigate the particular crises of agricultural production introduced by capitalist society and how these might be overcome by rational science.

‘The physical composition of the soil’, Marx noted, ‘suddenly drops out of the sky in Ricardo’ and the other classical economists, such as Malthus (Marx 1973: 267). The secret, however, was to see its earthy co-evolution in conjunction with human cultivation. Although human beings had an inherent relation to

nature through their need to meet their subsistence needs and hence through production, this was an evolving natural and historical relation, and not as Malthus himself claimed a divine, preordained fact resulting from ‘the gracious designs of Providence’ (Malthus 1970: 201–12).¹¹

The laws of production and exchange under capitalism, Marx observed, were ‘indifferent’ to a worker’s ‘organic presence’. Rather capitalism promoted a distinctive social and historical relation to population, designed always to produce relative surplus population – the main lever to accumulation. Capitalism’s main presupposition was the dissolution of the relation between the population and the land, and hence between the population and food production (Marx 1973: 604–5). The population problem could not therefore be isolated from the absolute domination of private property, which forcibly separated human beings from the earth and the reproduction of the most basic necessities of life, creating an earth that was for them non-property, non-landownership, and non-earth – while also generating through this same process of expropriation a mass of proletarians who had no means of livelihood except through the sale of their labour power.

Socialism (communism) was to be distinguished from capitalism, in Marx’s conception, by its return at a higher level to the requirements of production in general, through the promotion of many-sided needs under a society of associated producers. Such free development required that ‘socialized man, the associated producers, govern the human metabolism with nature in a rational way, bringing it under their collective control ... accomplishing it with the least expenditure of energy and in conditions most worthy and appropriate for their human nature’ (Marx 1998: 807; translation according to Marx 1981: 959). The universality of the new society was to be found not just in the development of the wealth of human needs and potentials for all individuals without exception, but also, and just as importantly, in its rational regulation of the human metabolism with nature. Just as the alienation of society under capitalism had its original basis in the alienation of nature, so socialism could only transcend the former by transcending the latter, and creating a genuine community with the earth.

Notes

- 1 The significance of both labour in general and production in general was recognized by Georg Lukács. In the former, he observed, Marx abstracted ‘from all the social moments of the labour process, in order to work out clearly those moments ... *common to all processes of labour*’ (Lukács 2000: 98). While an identical logic was evident in the concept of production in general.
- 2 For a systematic analysis of this part of Marx’s analysis see Foster and Burkett (2000).
- 3 For treatments of Marx’s theory of metabolic rift see Foster (1999: 366–405); Foster (2000: 155–63); Burkett (2006: 202–7). Paul Burkett discusses how the development of science, e.g. with respect to agriculture, in Marx’s conception, gave new insights into production in general, the understanding of which was formed by ‘the *natural-scientific study* of human production and its natural conditions across different modes of production, and not just capitalism’ (Burkett 2006: 89–90).

- 4 These and the other subheadings in the *Grundrisse* were added by the 1939–41/1953 editors based on the index he provided to his seven notebooks (see Marx 1973: 66).
- 5 For a useful discussion of this part of the *Grundrisse* see Hobsbawm (1964).
- 6 Edward Wakefield's theory of colonialism argued that the only way to create a basis for industrial wage labour in the colonies was to first create monopolies in the land to prevent workers from escaping into small subsistence plots. This view was, according to Marx, of 'infinite importance' in understanding the presuppositions of capitalism (Marx 1973: 278).
- 7 Bacon's complex notion of the domination and subjugation of nature, while frequently expounded in the form of metaphors drawn from the domination within society, was compatible with notions of sustainability insofar as it demanded that society follow 'nature's laws'. The Baconian ruse was that nature could be mastered through its own laws. But nature's laws *if followed completely* nonetheless put restrictions on production – those necessitated by reproduction and sustainability. For a discussion of the full complexity of the Baconian view in this respect see Leiss (1974).
- 8 This paragraph borrows from John Bellamy Foster, 'The Communist Manifesto and the Environment', in Panitch and Leys (1998: 169–89). Michael Lebowitz has demonstrated that Marx pointed to two kinds of barriers to capital, leading to accumulation of contradictions and crises: general barriers common to production in general, and thus having to do with natural conditions, and more specific historical barriers immanent to capital itself (see Lebowitz 1982).
- 9 '*Après moi le déluge!* Is the watchword of every capitalist and of every capitalist nation. Hence Capital is reckless of the health or length of life of the labourer, unless under compulsion from society' (Marx 1996: 275).
- 10 Although Malthus later attributed the law of arithmetic increase with regard to food production to the classical theory of rent and diminishing returns, he did not employ this argument in any of the numerous editions of his *Essay on Population*, but only in his later *Summary View of the Principle of Population*. Consequently Marx was to rule it out as an argument in the formation of Malthus' population theory (see Marx 1973: 608; Foster 2000: 142–4).
- 11 Early works on ecological Marxism, particularly the work of Benton (1989), criticized Marx for failing fully to incorporate a concept of natural limits, and compared Marx unfavourably to Malthus in this respect. Benton's interpretation, however, was later overturned by the much more systematic treatment of Marx's analysis by Burkett (1998a and 1998b). What becomes clear is that Marx's analysis was far more theoretically sophisticated and concrete than the Malthusian suprahistorical conception, even with regard to natural limits, and population itself.

References

- Bacon, Francis (1993) *Novum Organum*, Chicago: Open Court.
- Benton, Ted (1989) 'Marxism and Natural Limits', *New Left Review*, 178: 51–86.
- Burkett, Paul (1998a) 'A Critique of Neo-Malthusian Marxism', *Historical Materialism*, 2: 118–42.
- Burkett, Paul (1998b) 'Labor, Eco-regulation and Value', *Historical Materialism*, 3: 119–44.
- Burkett, Paul (1999) *Marx and Nature: A Red and Green Perspective*, New York: St. Martin's Press.
- Burkett, Paul (2006) *Marxism and Ecological Economics*, Boston: Brill.
- Dickens, Peter (2004) *Society and Nature*, Malden, MA: Polity.
- Foster, John Bellamy (1998) 'The Communist Manifesto and the Environment', in Leo Panitch and Colin Leys (eds), *The Socialist Register*, New York: Monthly Review Press.

- Foster, John Bellamy (1999) 'Marx's Theory of Metabolic Rift', *American Journal of Sociology*, 105(2): 366–405.
- Foster, John Bellamy (2000) *Marx's Ecology: Materialism and Nature*, New York: Monthly Review Press.
- Foster, John Bellamy (2007) 'The Ecology of Destruction', *Monthly Review*, 58(9): 1–14.
- Foster, John Bellamy and Burkett, Paul (2000) 'The Dialectic of Organic/Inorganic Relations', *Organization & Environment*, 13(4): 403–25.
- Hegel, G.W.F. (1970) *The Philosophy of Nature*, vols 1–3, Atlantic Highlands, New Jersey: Humanities Press.
- Hegel, G.W.F. (1969) *The Science of Logic*, London: George Allen and Unwin.
- Hegel, G.W.F. (1975) *Hegel's Logic*, Oxford: Oxford University Press.
- Hobsbawm, Eric J. (1964) 'Introduction' in Karl Marx, *Pre-Capitalist Economic Formations*, New York: International Publishers.
- Lebowitz, Michael (1982) 'The General and Specific in Marx's Theory of Crisis', *Studies in Political Economy*, 7: 5–25.
- Lebowitz, Michael (2003) *Beyond Capital: Marx's Political Economy of the Working Class*, New York: Palgrave Macmillan.
- Leiss, William (1974) *The Domination of Nature*, Boston: Beacon Press.
- Lukács, Georg (2000) *A Defence of History and Class Consciousness: Tailism and the Dialectic*, London: Verso.
- Malthus, Thomas (1970) *An Essay on the Principle of Population and A Summary View of the Principle of Population*, Harmondsworth: Penguin.
- Marx, Karl (1973) *Grundrisse: Foundations of the Critique of Political Economy*, Harmondsworth: Penguin.
- Marx, Karl (1975) 'Economic and Philosophic Manuscripts of 1844', in *Marx and Engels Collected Works*, vol. 3: *Works of Marx, March 1843–August 1844, Works of Engels, May 1843–June 1844*, Moscow: Progress Publishers.
- Marx, Karl (1976) *Capital*, vol. I, New York: Vintage.
- Marx, Karl (1979) 'The Eighteenth Brumaire of Louis Bonaparte', in *Marx and Engels Collected Works*, vol. 11: *Marx and Engels 1851–1853*, Moscow: Progress Publishers.
- Marx, Karl (1981) *Capital*, vol. II, New York: Vintage.
- Marx, Karl (1996) 'Capital, vol. I', in *Marx and Engels Collected Works*, vol. 35: *Capital, Vol. I*, New York: International Publishers.
- Marx, Karl, (1998) 'Capital, vol. III', in *Marx and Engels Collected Works*, vol. 37: *Capital, Vol. III*, New York: International Publishers.
- Marx, Karl and Engels, Friedrich (1976) 'German Ideology', in *Marx and Engels Collected Works*, vol. 5: *Marx and Engels April 1845–April 1847*, Moscow: Progress Publishers.
- Mészáros, István (1995) *Beyond Capital*, New York: Monthly Review Press.
- Mészáros, István (2001) *Socialism or Barbarism*, New York: Monthly Review Press.