The Oppression of Nature and the Latent Transhumanism of Marxism

James Steinhoff
Institute of Communication, Culture, Information and Technology,
University of Toronto Mississauga

ABSTRACT: In this paper, I argue that Marxism is inherently transhumanist because it entails a drive to de-reify nature, including the human being. I argue that the logic of Marxism also requires the temporal inversion of historical materialism, and its projection into the future. This is the transhumanism of Marxism. It is predominantly latent today. Marxists have largely been reluctant to conduct the temporal inversion of their historical materialist perspective, and in doing so have accepted an arbitrarily reified notion of the human. Transhumanists have not. I link Marxism and transhumanism through an ontological concept of suffering. Suffering encapsulates the materialist ontological relation between nature and the human. By tracing how suffering is articulated in both Marxism and transhumanism, I argue that we can get an idea of how to fully work out Marxism's temporal inversion and revive its latent transhumanism.

KEYWORDS: Transhumanism, Marxism, suffering, nature, futurism, materialism, posthumanism, pessimism

Introduction

In this paper, I argue that Marxism is inherently transhumanist because it entails a drive to de-reify nature, including the human being. From a Marxist perspective, nature ought to be, like religion and capital, considered a barrier to human self-production. This does not mean that Marxism should devalue the natural realm (i.e. ignore ecological concerns). It means that as a historical materialism, Marxism has no time for essences and is dubious of putative facts of nature; it insists that such facts are historically-specific, arising within particular social (geographic, economic, technological) contexts. Marxism thus denies, for instance, the truth of the early political economist Adam Smith's (1961) claim that the division of labour in capitalism exists because of a "propensity in human nature … to truck, barter and exchange one thing for another" (29). Marxism argues that this propensity to exchange was historically produced and is in no way a fact of nature. With this sort of critique Marxism enacts both its historicism and its materialism. I argue, however, that the logic of Marxism also requires the temporal inversion of historical materialism, and its projection into the future. This is the transhumanism of Marxism. It is predominantly latent today. Marxists have largely been reluctant to conduct the temporal inversion of their historical materialist perspective, and in doing so have accepted an arbitrarily reified notion of the human. Transhumanists have not.

I have argued previously that Marxism and transhumanism have substantial parallels in terms of some of their central philosophical categories, including those of the human, nature and technology (Steinhoff 2014). This is not a position widely held by Marxists or transhumanists. Transhumanist Nick Bostrom (2005b) describes Marx as a major historical contributor to a contemporary "bioconservative" movement, by which he means "transhumanism's opposite." From a Marxist perspective, Jeff Noonan (2016) argues that the parallels I draw between transhumanism and Marxism are "superficial" because the orientations of

the two frameworks are programmatically opposed (41). Against Bostrom, I argue that bioconservatism is inconsistent with Marxism and against Noonan, I hold that the similarities between the two run deep. Here I focus on one particular similarity: the concept of suffering. While I link Marxism and transhumanism through the concept of suffering, it is not primarily from an ethical standpoint, but rather an ontological one. Suffering encapsulates the materialist ontological relation between nature and the human. By tracing how suffering is articulated in both Marxism and transhumanism, I argue that we can get an idea of how to fully work out Marxism's temporal inversion and revive its latent transhumanism.

First, I show that suffering, for Marx, derives from both social relations (e.g. class, exploitation) and nature (the finite, corporeal human mode of being).[1] I argue that despite Marx's example, Marxists have, with few exceptions, tended to concern themselves with suffering derived from the social, rather than natural, domain. Then I consider two exceptions to this rule: the Bolshevik revolutionary and theorist Leon Trotsky (1957) and the Italian Marxist philologist Sebastiano Timpanaro (1975; 1979).[2] Trotsky presented an explicitly transhumanist understanding of communism, founded on a pessimistic comparison drawn between capital, religion and nature as anti-human, oppressive forces. Five decades later, Timpanaro appraised nature in similarly pessimistic terms, though unlike Trotsky, he did not believe that communism could overcome the suffering imposed by it. Timpanaro discerned the transhumanism of Marxism but refused to embrace it. This, I suggest, was because his materialism was incompletely ramified. Unlike Trotsky, and Marx himself, Timpanaro did not extend the logic of the Marxist, materialist conception of the human into the future.

Next, I extract from transhumanist writers a conception of transhumanist suffering, which is centrally

concerned with the future. Transhumanist suffering validates a whole domain of nature-inflicted suffering which is largely off limits for Marxists, for whom it should be stoically accepted, or ignored, while focusing on socially-inflicted suffering instead. Transhumanist suffering suggests how Marxism could, and I argue should, augment its struggle against capital and religion with the struggle against nature. In the concluding section, I consider Marx's notion of ruthless criticism and Werner Bonefeld's notion of a wholly negatory critical theory as theoretical grounds for this expanded struggle.

Marxist Suffering

What is a Marxist conception of suffering? Ashok Vohra (1983) reads Marx through Buddhism and understands Marx as holding that the cause of suffering is greed. Marx's great contribution is, however, to have shown precisely that capital is more than a mere collection of greedy capitalists. Capital is rather a system which continually reproduces itself by selectively eliminating social relations which do not advance the valorization of value. Greed is a surface level manifestation of the immanent drive of capital to valorize. As Michael Heinrich (2004) puts it "the fact that the individual capitalist constantly attempts to increase his profit is not rooted in any psychological trait like 'greed.' Rather, such behaviour is compelled by the competitive struggle among capitalists" (88). Marx was no Buddhist, yet he was not unconcerned with suffering, which is a major theme in Marx's *Capital*. Suffering is central to the so-called immiseration thesis, or the notion that the enrichment of capital tends to entail the immiseration of labour. In his discussion of the "General Law of Capitalist Accumulation" Marx asserts that the "accumulation of misery [is] a necessary condition, corresponding to the accumulation of wealth" (Marx 1990, 799; see also Benanav and Clegg 2018). Suffering is also central to Marxism according to scholars who read Marx as an ethical thinker. According to Andy Merrifield (1999) "Marx's concept of suffering takes the point of view of those who do suffer and who, under an alternative social system, might suffer and feel differently" (85). On this reading, the idea that under communism people might suffer differently is "the central philosophical tenet upon which Marx's

---

1   It is probably impossible to categorically demarcate the natural and non-natural. As John Durham Peters (2015) notes, it is "hard to say where nature begins and artifice ends" (33). Indeed, my argument, and Marxist thought generally, hinges on this distinction being, at the minimum, fuzzy. The distinction will ultimately be overcome in the course of the argument.

2   Other explicit exceptions that could be cited include the Irish scientist J.D. Bernal (1929) and the Russian philosopher-scientist Alexander Bogdanov (1922). Less explicit, but suggestive, options include Lukács (1971), Mészáros (1970), Vogel (1996), Schmidt (2014).

mature critique of political economy is founded, and it remains implicit in his later writings" (Merrifield 1999, 85). Similarly, Eugene Kamenka (1969) attributes to Marxism a negative utilitarian ethics, based on the notion "that all men want to remove suffering" (51).

However, as already noted, I am not pursuing an ethical argument here, and I do not believe that was Marx's intention either (see Heinrich 2004, 35-36). Rather I am interested in how suffering is implicated in a Marxist perspective at a foundational ontological level. My concern is with suffering deriving from nature, an underestimated, though I suggest fundamental, aspect of Marx's materialist theorization of the human. Focusing on this aspect casts Marxism as a kind of philosophical pessimism. Pessimism is characterized by the belief, in the words of arch-pessimist Arthur Schopenhauer, that "human life is dispositionally incapable of true happiness, that it is essentially a multifaceted suffering and a thoroughly disastrous condition" (2010, 349). For pessimists, suffering is broadly conceived and is not eradicable; all "efforts to banish suffering do nothing more than alter its form" (Schopenhauer 2010, 341). Pessimism is generally not well regarded. As Eugene Thacker (2015) notes, it is considered "the lowest form of philosophy, frequently disparaged and dismissed, merely the symptom of a bad attitude" (3). In both Marxist and transhumanist circles a dim view is taken of pessimism. Indeed, both are more likely to be associated with an excess of optimism.[3] But both materialist perspectives, by placing suffering deriving from nature in a place of ontological priority, take up a pessimistic orientation. In Marx's case, this is most apparent in his youthful writings on the relations between the human and nature.

In *The German Ideology*, Marx and Engels wrote that a materialist analysis should begin with consideration of "the corporeal organisation of human beings" although they never elaborated precisely how to do so (quoted in Fracchia 2005, 39). There is a clue, however, in the *Economic and Philosophic Manuscripts of 1844's* description of the human as possessing a dual aspect. The human is a "natural being" made up of two aspects: it is both "an *active* natural being" defined by

"tendencies and abilities" as well as a "corporeal, sensuous, objective ... *suffering*, conditioned and limited creature" (Marx 1978a, 115). The latter of these, the conditioned, suffering nature of the human, is a result of the fact that the "essential" objects of human need "exist outside him, as *objects* independent of him" (Marx 1978a, 115). This privational formulation of the inherent human dimension of suffering can be compared to Schopenhauer's (2010) assertion that: "All willing springs from need, and thus from lack, and thus from suffering" (219-220). The human exists on the basis of the "material substratum furnished by nature without human intervention" (Marx 1990, 133). However, the human exists in a state of suffering because the material substratum does not immediately meet its needs.

The tendencies, abilities and needs which define the human are not essentially fixed but change as the human adapts to new material conditions and transcends its previous ways of existing (Mészáros 1970, 119-120). Marxism thus conceives of the human as "a bootstrapped, self-reinforcing loop of social cooperation, technoscientific competences and conscious awareness" which through "social activity transforms its natural basis" (Dyer-Witheford 2004, 6). Human nature is a historical process of change. The human is a natural, biological creature but also a historical and social being. This does not, of course, mean that nothing remains constant in the human. As Marx (1993) puts it in *Grundrisse*: "Hunger is hunger, 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" (92). Humans must intake energy to survive, but that energy may come in various forms: "if some people refuse to eat what others consider a delicacy, the fact is that both have a minimum caloric requirement" (Fracchia 2005, 37). The basic suffering nature of the human remains over time, although it is modulated differently in different contexts, and some modulations seem preferable to others. While suffering is not going to be eliminated, it may be to some degree ameliorated.

By considering suffering in light of its amelioration, we look towards the future, and from a Marxist perspective, to communism. In a famous passage from *Capital* Volume III, Marx suggests that communism

---

3   See Verdoux (2009) for a rare argument for a pessimist transhumanism.

consists of humans collectively and consciously taking control of their relations with nature:

> The realm of freedom really begins only where labour determined by necessity and external expediency ends; it lies by its very nature beyond the sphere of material production proper. … Freedom, in this sphere, can consist only in this, that socialized man, the associated producers, govern the human metabolism with nature in a rational way, bringing it under their collective control instead of being dominated by it as a blind power; accomplishing it with the least expenditure of energy and in conditions most worthy and appropriate for their human nature. But this always remains a realm of necessity. The true realm of freedom, the development of human powers as an end in itself, begins beyond it, though it can only flourish with this realm of necessity as its basis. (Marx 1991, 958-959)

Communism, the "development of human powers as an end in itself," has as its precondition the control of the contingencies of nature, under collective human volition, presumably primarily via the application of technology.[4] Marx's relationship with technology as a whole is ambivalent, but such passages show a promethean dimension to his thought, where technology is an essential aspect of revolutionary thought and practice (Wendling 2009, Chapters 3 and 4). Since the human is part of nature, the governance of the human metabolism with nature must also include the human being itself and its passive, suffering aspect. Yet, Marx never addressed how that aspect of the human is to be regarded in relation to the "true realm of freedom." This connection would be taken up by Soviet Marxists.

Self-Harmonization

Soviet Marxism amplified the technological prometheanism present in certain moments of Marx's writings. In 1918, after Lenin signed the Brest-Litovsk treaty with the Central Powers, ending Russia's participation in the first industrialized war, he mused that "without machines … it is impossible to live in modern society. It is necessary to master the highest technology or

be crushed" (quoted in Bailes 1978, 49). Lenin also considered that without "grasp[ing] all the science, technology and art, we will not be able to build life in a communist society" (quoted in Bailes 1978, 52).

For Trotsky, technology was essential not only to combat capitalist imperialism and organize communist society, but to overcome the contingencies of nature via what E.O. Wilson (1998) would later call "volitional evolution" (299). According to Trotsky (1957): "Communist life will not be formed blindly, like coral islands, but will be built consciously, will be tested by thought, will be directed and corrected." An analogy is drawn here between the contingency of nature and the invisible hand of the market, which the Soviets aimed to replace with a centrally planned economy. Trotsky, however, referred to conscious control not only of an economic system, but also of the human body. In his account, we can see a more developed conception of the corporeal, needy aspect of the human that Marx outlined. Trotsky suggests that under communism:

> Man at last will begin to harmonize himself in earnest. … He will try to master first the semiconscious and then the subconscious processes in his own organism, such as breathing, the circulation of the blood, digestion, reproduction, and, within necessary limits, he will try to subordinate them to the control of reason and will. Even purely physiologic life will become subject to collective experiments. The human species, the coagulated *Homo sapiens*, will once more enter into a state of radical transformation, and, in his own hands, will become an object of the most complicated methods of artificial selection and psycho-physical training. (Trotsky 1957)

Ultimately, communist humanity will reproduce itself as a "higher social biologic type" (Trotsky 1957). Marxists commonly deride capital and religion for holding back the potential of human beings, but something else is going on here. Trotsky's contemporary human is described as "coagulated," its changing nature bogged down not only by capital and religion, but by nature itself. Trotsky is not referring only to the changing manifestations of persistent material needs, such as hunger. While he recognizes there are "necessary limits" on the extent to which the human

---

4 For a very different, ecological reading of Marxian passages such as this (and a truly remarkable book overall) see Foster (2000).

may be changed, these seem to be quite far off. Even "purely physiologic life," presumably referring to physical processes occurring in the body below the level of consciousness, are within the purview of communist revolution. Communism would need "technical means" to achieve this aspect of revolution: "ancient man, clear in thought but poor in technique, was confined. He could not as yet undertake to conquer nature on the scale we do today, and nature hung over him like a fate" (Trotsky 1957).

Trotsky's transhumanist pronunciation is motivated by a pessimistic view of the corporeal, needy aspect of the human. He speaks of the human's "extreme anatomical and physiological disharmony" and the "extreme disproportion in the growth and wearing out of organs and tissues" (Trotsky 1957). Biological frailty imparts to humanity "a pinched, morbid and hysterical fear of death, which darkens reason and which feeds the stupid and humiliating fantasies about life after death" (Trotsky 1957). Volitional evolution is positioned in the same historical register as social revolution: "The human race will not have ceased to crawl on all fours before God, kings and capital, in order later to submit humbly before the dark laws of heredity and a blind sexual selection!" (Trotsky 1957). Here social and natural factors are equated as barriers to communism. Like religion and capital, nature is an oppressive, anti-human force.

While Trotsky should not be interpreted as representative of Marxism as such, his transhumanist perspective is one expression of the notion of the communist new man, which was once widely popular in Marxist circles. The notion of the new man derives from the fundamental Marxist notion that "the mode of production of material life conditions the social, political and intellectual life process in general" (Marx 1978b, 4). The basic idea is that once humans were free of the system of capital, which limits their development, a wholly new type of collectivist human could be created through practices of education, labour and direct technological intervention. For the Soviet psychologist Lev Vygotsky (1994), following the social liberation of humanity from capital, the species "undoubtedly will rise to a higher level and transform [its] very biological organization," produc-

ing a "new man" which will "resemble the old kind of man … in name only" (182-183). The Argentine revolutionary Che Guevara (2005) proclaimed that "We will make the human being of the 21st century. … We will forge ourselves in daily action, creating a new man and woman with a new technology."

As Yinghong Cheng (2009) puts it, the new man represented "a new stage in human evolution" in the Marxist imaginary (3). While the notion of the new man was undoubtedly advanced as an ideological counterforce to the hegemony of capitalist individualism, it also included a plan for the physiological revision of the human being. The new man has largely disappeared from Marxist discourse along with the transhumanism of Marxism. The underlying pessimism which motivated it, concerning suffering imposed by nature, did not, however, entirely disappear along with it.

Marxist Pessimism

The path I want to trace towards a revived transhumanism of Marxism proceeds via an idiosyncratic reader of Marx, the philologist Sebastiano Timpanaro, whom Anderson (1989) suggests is "more finally pessimistic, with a classical sadness, than ... perhaps any other socialist thinker of this century" (92).[5] Timpanaro points the way towards the transhumanism of Marxism by arguing for its impossibility. His work is distinctive because it trenchantly insists that suffering imposed by nature should be a central Marxist concern. He described his intent as elaborating "an ever more accurate definition of the links between the struggle for communism and the struggle against nature – without, however, identifying the two in a simplistic way" (Timpanaro 1975,

5   A different kind of Marxist pessimism was developed by Frankfurt School theorists such as Theodor Adorno, Max Horkheimer and Herbert Marcuse. Perry Anderson (1989) holds that between 1920 and 1960 these thinkers lost confidence in a revolutionary future; in its place developed a "pervasive melancholy" (89) and "subterranean pessimism" (88). The increasingly hegemonic reach of capital led the critical theorists to believe that their contemporary capitalism was a "completely administered, integrated, one-dimensional society" which no longer offered any possibilities for revolution (Postone 1993, 85). Technology was no longer the means by which communism would ameliorate the suffering imposed by nature. Speaking of Adorno and Horkheimer, Anderson (1989) argues that it became a dubious idea that "man's ultimate mastery of nature" would lead to a "realm of deliverance beyond capitalism" (89). The central object of pessimism was no longer nature, but attempts to dominate nature, which, the critical theorists held, would lead to the domination of the human, whether in capitalist or socialist hands.

11-12). Class struggle and the struggle against nature are connected by a theoretical orientation he dubbed "materialist pessimism" (Timpanaro 1975, 20). This is not, however, a pre-existing pessimism that is run through a Marxist wash and comes out materialist. On the contrary, it is a pessimism which derives, according to Timpanaro, from the fundamental premise of materialism: that all that exists is composed of matter/energy and nothing else. He defines materialism as:

> above all acknowledgement of the priority of nature over 'mind', or if you like, of the physical level over the biological level, and of the biological level over the socio-economic and cultural level; both in the sense of chronological priority … and in the sense of the conditioning which nature *still* exercises on man and will continue to exercise at least for the foreseeable future. (Timpanaro 1975, 34)

The primacy of the physical does not mean Laplacian determinism or crude mechanistic Marxism in which superstructure is strictly determined by economic base. It refers to the suffering aspect of the human, or "the element of passivity in experience" which obtains regardless of the social relations humans exist within (Timpanaro 1975, 34). Recognition of this, Timpanaro (1975) said, "remain[s] somewhat in the shadows in Marxism" (21). He argued that fundamental natural forms of suffering such as illness, decay and death ought to be recognized by Marxism as "nature's oppression of man" (Timpanaro 1975, 67). In his argument for this we see once again the comparison of social and natural forces:

> Marxists put themselves in a scientifically and polemically weak position if, after rejecting the idealist arguments which claim to show that the only reality is that of the Spirit and that cultural facts are in no way dependent on economic structures, they then borrow the same arguments to deny the dependence of man on nature. (Timpanaro 1993, 75)

According to Timpanaro, Marxists have evaded the problem of natural suffering in two contradictory ways. Some have held that under communism, "sickness, old age and death, although they will continue to exist, will no longer be experienced as ills. Man

will be stripped of his own individualism and feel at one with society, eternal through it" (Timpanaro 1975, 17). This is the notion of the new man as ideology. Other Marxists have argued that once scientific and technological progress is no longer immured in the logic of capital, it will experience a new flourishing that will mitigate or eliminate such problems (Timpanaro 1975, 18). This is the notion of the new man as a technological-scientific project, as expressed by Trotsky.

Timpanaro was dubious of both responses. He held that while the first was a "noble wish" it "belongs to a pre-Marxist, a stoic and idealist way of overcoming physical ill, which instead of eliminating it in practice denies it in the realm of ideas" (Timpanaro 1975, 17). His forceful riposte is that if this is an acceptable response, there is no reason for it to not also apply to "social ills," including the ignominy of capitalist class society (Timpanaro 1975, 17). In reply to the second response, he asserts simply that the passive element of the human cannot be entirely eliminated:

> While it is possible to foresee a future in which man's oppression by man will be eliminated (even if one cannot afford any idle confidence in the certainty of this prospect), one cannot imagine a future in which the suffering caused by the disparity between certain human biological limits and certain human aspirations … can be radically eliminated. Of course, many individual diseases will be cured, the average length of the human life will be prolonged, technical means will be developed which increase man's power in particular areas. … But these will always be reformist, and not revolutionary, forms of progress. Man's biological frailty cannot be overcome, short of venturing into the realm of science fiction. (Timpanaro 1975, 61-62)

Passing over the suggestive reference to science fiction for now, we see that for Timpanaro, while a struggle against natural suffering is entailed by Marxism, it is not forecasted to be a successful struggle. Marxism is opposed to suffering derived both from social relations and nature, but nature poses an insoluble problem. A gap between biological limits and human aspirations will always remain:

Old age remains a highly unpleasant fact. And no socialist revolution can have a *direct* effect on the fundamental reasons that account for its unpleasantness. … Communism does not imply, in and of itself, a decisive triumph over the biological frailty of man, and it appears to be excluded that such a triumph ever be attained (unless one wishes to indulge in science-fiction speculation). (Timpanaro 1975, 63)

The dissolution of capital, the disappearance of wage labour and the value-form and the establishment of conditions for the free development of all humans will not make the natural processes by which muscles atrophy, lungs collapse, bladders fail and brains degrade any less unpleasant. While new medical techniques will be invented and more and more problems ameliorated, the fundamental fact remains that ultimately, humans will continue to suffer. Nevertheless, the suffering imposed by nature "must be confronted … materialistically – if Marxism is to be not simply the replacement of one mode of production by another, but something far more ambitious: the achievement of the greatest possible degree of happiness" (Timpanaro 1975, 21). Marxism entails the technological revision of nature and the effort to mitigate the suffering imposed by it. Even though this project cannot be completed, a trajectory towards reconfiguring suffering is required. Marxism must accept the suffering of nature as ineluctable even as it struggles against it. It is a doomed project; a prometheanism so pessimistic it becomes fatalistic.[6]

But where exactly should the line be drawn between the technological overcoming of nature and science-fictional speculation? Timpanaro does not specify, but senescence and death are certainly presented as inevitable. Of course, the line between technological reality and science fiction is always moving. Science fiction becoming reality is a foundation of

transhumanist thought. So why does Timpanaro draw his line short of, say, radical life extension or mind uploading? Obviously a person's technological imagination depends on all kinds of subjective and contextual factors. But we can also point to a theoretical reason.

Kate Soper rejects Timpanaro's materialist pessimism because she sees it as treating the biological as an "ontological category, and tends to identify materialism with the recognition of this ontological realm" (Soper 1979, 93). Soper's problem is with how Timpanaro asserts, as a materialist, the primacy of matter over mind. This is problematic, holds Soper, because the "effects [of nature] never exist concretely in a pure natural or biological form but only in the content given them by socio-economic relations" (Soper 1979, 92). Her contention is that, if one accepts Timpanaro's point of view, "it is all too easy to say of human society at any point: 'that is the human condition,' and thereby to naturalize it, to collapse the difference between natural and social determinants operating within the social order" (Soper 1979, 95-96). Soper's point is that since all knowledge of nature is mediated by a given social context, there is no way to establish directly the facts of nature. Therefore, Timpanaro's pessimism is based on a false objectivity and all his perspective can offer is a particular view of nature from a specific time and place.

On the other hand, Soper asserts that Timpanaro is right to counter idealism by "pos[ing] the question of the extent to which Marxism either inherently or in its contemporary 'distortions' supports a false reduction of natural to social determinants" (Soper 1979, 72). Here we might think of György Lukács' (1971) claim that: "nature is a social category" (130). Soper thus wants to avoid both naturalizing social factors and socializing natural factors. How is one to do this? Her solution is to appeal to the historical dimension of historical materialism. From a historical perspective, "human culture comprises a single order in which one never discovers purely 'natural' or purely 'social' elements instantiated concretely" (Soper 1979, 62). Against Timpanaro's "givens" which are actually "never given as such," Soper endorses an ontological blurring which applies even to death, which "though it comes to all … comes in a thousand different ways" (Soper 1979, 95). Timpanaro's pessimism is thus evaluated, like other

---

6   Robert Dombroski (2001) argues that Timpanaro's pessimism "flaws his objectivity" because materialism should "remain an activity grounded in the relational conditions of reality. It passes from science to ideology the very moment it represents a political and ethical viewpoint" (342). Here we see precisely the first Marxist response to the suffering imposed by nature, calling for stoicism and ideological overcoming of nature, which Timpanaro dismissed. For Dombroski, a Marxist ought to be completely neutral concerning illness and death. Timpanaro's riposte that the same logic should then also apply to social conditions producing illness and death stands as an effective rebuttal.

pessimisms, as pathological, and particularly so in the Marxist context because it ignores historicity and thus the inextricable sociality of nature.

But what happens if we temporally invert Soper's historicizing logic in which natural and social factors are inextricably fused? Timpanaro precisely grasps Marx's passive aspect of the human, pessimistically highlighting the suffering that nature imposes on the human. But, as Soper correctly points out, Timpanaro underestimates the extent to which the natural is social and thus he posits particular sufferings, such as senescence and death, as more or less essential, more or less facts of nature. Soper refuses to essentialize particular sufferings because they are, while certainly natural, inextricably tied up with social relations. Her critique of Timpanaro is thus implicitly futural. What is the particular influence of the social on the natural phenomenon of death today? What about in 500 years? For Soper, it is impossible to say. It is impossible, from a Marxist perspective (or any perspective not committed to essentialism) to establish the necessity of particular sufferings imposed by nature because one must always remain open to the future conversion of putative natural facts into social ones. It is unlikely that Soper's critique was intended to persuade Timpanaro to accept the science fiction scenarios he derided. Yet, I argue that this is precisely what her argument, and a Marxist logic, entails. The historical dimension of historical materialism contains its temporal inversion, extrapolating its logic of social/natural interpenetration into the future as well as the past.

Consider Marx's materialist theory of the human, which recognizes the interpenetration of the natural and the social; the human is a recursive process, not an essence. He thought this out primarily via the historical dimension. The substratum furnished by nature is reproduced differently over the course of human history as technologies, cultures and modes of production change. This processual view of the human entails a potentially infinite process, which is impossible to plot in advance. The significance of this impossibility is visible in Marx's musings on a communist definition of wealth. Once the "limited bourgeois form" of wealth is "stripped away" it will be possible to think of wealth in a much broader sense, including the "full devel-

opment of human mastery over the forces of nature, those of so-called nature as well as of humanity's own nature" (Marx 1993, 488). The mastery of nature is the precondition for another definition of communist wealth as the "absolute working out of [humanity's] creative potentialities, with no presupposition other than the previous historic development, which makes this totality of development, i.e. the development of all human powers as such the end in itself, not as measured on a predetermined yardstick" (Marx 1993, 488). The human has no fixed essence, so its future incarnation remains unknowable and unpredictable, obscured beyond an event horizon constituted by possible interpenetrations of the natural and social yet to come. Wealth in this communist sense is what humans *do not* have now and what they *might* have in the future. It is impossible to say for certain what the development of all human powers as an end in itself would look like. Timpanaro's materialist pessimism is thus not materialist enough. Timpanaro's project of struggle against nature should not have halted at an arbitrary point determined by his present day technology. The struggle against nature opens onto an uncertain future.[7]

Most Marxists have been reluctant to conduct the temporal inversion I have extracted from Marx and Soper. One no longer hears about a new communist human being. Accelerationism comes closest in recent Marxian discourse, and includes transhumanist themes, including technological augmentation of the body. While some accelerationist work, such as Srnicek and Williams (2015), leans towards transhumanism, it does so while omitting discussion of the necessity of class struggle (Brown 2016). Xenofeminists, on the other hand, clearly recognize the oppression of nature: "If nature is unjust, change nature!" (Laboria Cuboniks 2018). Admirably, they do so while also recognizing the necessity of class struggle. Regardless, this paper focuses on explicitly Marxist works and cannot include adequate discussion of the accelerationist current.

The point I wish to make is that unlike Marxists, transhumanists have conducted the temporal inversion I have suggested, and have been readily working out its consequences. Drawing on their ruminations, we can

---

7 This does not mean replacing a pessimistic appraisal of nature with a triumphalist technological optimism, as I argue below.

sketch a notion of transhumanist suffering which illustrates how to think materialistically about the future of suffering. Transhumanist suffering may then function as a guide for rebooting Timpanaro's pessimistic appraisal of nature into a revived transhumanism of Marxism.

Transhumanist Suffering

Transhumanism refers to a variety of positions united by an interest in "fundamentally improving the human condition through applied reason, especially by developing and making widely available technologies to eliminate aging and to greatly enhance human intellectual, physical, and psychological capacities" (Transhumanist FAQ, nd). Transhumanism is compatible with diverse political and philosophical views, though it has been predominantly associated with libertarian and liberal democratic politics and materialistic and scientistic philosophical views (Hughes 2012).[8] Transhumanists sometimes describe their goal as the human species obtaining control over its own evolutionary trajectory (Huxley 1957). In addition to enhancing human capacities and increasing lifespans, many transhumanists have even more ambitious goals, including overcoming "involuntary suffering, and our confinement to planet Earth" (Humanity+ 2009).

For transhumanists, the locus of suffering is primarily the natural, rather than the social, realm and it derives centrally from the human body. Transhumanists argue that "aging is a disease" (Vita-More 2020) and that "in some ways, human minds and brains are just not designed to be happy" (Transhumanist FAQ, nd). The amelioration of suffering is expected to come primarily from technological progress. Few transhumanists would disagree with the idea that the "extensive suffering that remains in the human world" can and should be "alleviated through sustained scientific advance" (Kurzweil 2005, 396). As Hughes (2007) puts it, transhumanists "generally believe that most forms of suffering, such as mental and physical illness, unwanted death, cruelty and poverty can be overcome

with human technological mastery and the advance of liberal democracy" (15). Thus, transhumanism can be understood as a project of the aggressive technological revision of nature, primarily routed through a market economy.

Transhumanism is not, as many critics make it out to be, aimed at achieving some kind of perfection (Idhe 2010; Mahootian 2012; Noonan 2016; Tirosh-Samuelson 2018). James Hughes (2007) correctly calls the criticism concerning perfection "specious, since no proximate transhumanist project of transcendence would leave posthumans without any challenges or limitations" (15). An exception here is Ray Kurzweil, whose millenarian moments exhibit a belief in a godlike future state. As far as I know no other transhumanists, excepting religious transhumanists like the Mormon Transhumanist Association, advocate such a perfectionist position. Transhumanism is more accurately conceived as a project of "improving nature's mindless 'design,' not guaranteeing perfect technological solutions" (More 2010, 139).

In general, it is safe to say that transhumanists tend to think more in terms of bodies and technologies than classes and modes of production, and in terms of technological, rather than social, revolution. For Nick Bostrom:

> There are limits to how much can be achieved by low-tech means such as education, philosophical contemplation, moral self-scrutiny, and other such methods proposed by classical philosophers with perfectionist leanings ... or by means of creating a fairer and better society, as envisioned by social reformists such as Marx or Martin Luther King. (Bostrom 2005a, 9)

The transhumanist philosopher David Pearce (1995) asserts similarly that "no amount of piecemeal political and economic reform, nor even radical social engineering, can overcome ... biological reality." He argues that "attempts to build an ideal society" will founder on the flawed biological machinery of the human, whether they are "utopias of the left or right, free-market or socialist, religious or secular, futuristic high-tech or simply cultivating one's garden" (Pearce 2007). The primary barrier to transhumanist revolution

---

8   While some transhumanists, such as Kurzweil, imagine the social relations in their transhumanist futures to be staunchly capitalist market economies, and libertarian transhumanists describe transhumanism as "under siege from socialism" (Istvan 2018), yet others are members of the Democratic Socialists of America (Murphy 2018).

is the human body, rather than the social relations those bodies live amongst. Conceived as a barrier, the body is the central cause of suffering. But what distinguishes a transhumanist conception of suffering from more conventional conceptions? I suggest it is infrastructural and expansive.

Infrastructurality

By calling transhumanist suffering infrastructural, I mean that it is a conception of suffering in which suffering derives from the material subsystems of the body which are the foundations for human life. Suffering derives from processes and structures existing far below the level of consciousness and can only be ameliorated by intervening at that infrastructural level. For instance, consciousness (whatever it is) depends for its existing, at the minimum, on the infrastructure of the brain's neural networks and the limbic system. Pathologies of consciousness, from an infrastructural perspective, are to be addressed by intervening directly in the functioning of those physical systems.

Pearce demonstrates the infrastructurality of transhumanist suffering with his version of transhumanism called abolitionism. Pearce identifies as a negative utilitarian and holds that transhumanism should aim to minimize the total amount of suffering in existence, aiming towards its abolition. Pearce (1995) argues that we should use technologies including nootropics, nanotechnology and genetic engineering, to "eliminate aversive experience from the living world" by "eradicat[ing] completely" the "biological substrates of suffering" for all entities capable of suffering. Pearce traces the origins of suffering to the "hedonic treadmill" proposed by psychologist Philip Brickman and social scientist Donald Campbell. Brickman and Campbell (1971) argued that pleasure is essentially relativistic, in that increased levels of pleasure entail the need for further levels of pleasure if pleasure is to continue being experienced. Essentially, their argument is that there is no final solution to the problem of suffering because pleasure always recedes into the distance as its novelty fades. Pearce holds that the experience of the hedonic treadmill results from our bodily infrastructure, adapted for evolutionary success, not the absence of suffering. The precise structure of Pearce's

perspective is not of interest here. The point I want to draw attention to is that, in contrast to a perspective which considers suffering as deriving from and possibly being ameliorated by social factors, and in contrast to a perspective that sees suffering as deriving from the body, but possibly being ameliorated by discursive social practices like therapy, mediation, religion or philosophy, abolitionist transhumanism targets molecular and chemical processes for its interventions. For Pearce (1995), suffering derives from "our corrupt code" and the "Darwinian pathologies of consciousness" and may be overcome via the "neurochemical precision-engineering of happiness."[9]

Hughes (2007) correctly points out that the abolitionist position is not held by all transhumanists, "many of whom worry that such perceptual and mood regulation might lead to a Panglossian conviction that there is nothing about the world that needs correction" (15-16). However, a less totalitarian but still very infrastructural approach to ameliorating suffering imposed by nature is ubiquitous in transhumanist thought; few transhumanists would object to the claim that the "roots of suffering are planted deep in your brain" and that therefore a significant reworking of its systems is necessary and desirable (Bostrom 2008, 4). Timpanaro did not possess such an infrastructural conception of suffering. He held that technological progress would cure diseases and increase lifespans, but he did not imagine that the subjective experience of suffering might be eliminated by rewiring its physical infrastructure nor that the processes of senescence leading organisms to necessarily perish might be reengineered.

Expansivity

Transhumanist suffering is expansive because it is a conception of suffering which refuses to be defined in relation to any essentialist conception of the human. Transhumanism's open-ended materialist conception of the human is shared by Marxism, but the former expects that the human will be dramatically technologically reconfigured and this entails that suffering has a vast temporal dimension which extends into the future.

---

9   Such a state of engineered bliss, Pearce argues, would not be one of stoned withdrawal from the world but one of increased freedom: "many dopamine-driven states of euphoria can actually enhance motivated, goal-directed behaviour in general" (Pearce 1995).

The contemporary human is a "work-in-progress" (Bostrom 2005a, 4) capable of perceiving and understanding only a "minute subspace of what is possible or permitted by the physical constraints of the universe" (Bostrom 2005a, 5). Many possible modes of being are thus beyond the comprehension of contemporary humans. Progress towards them is required to even discern if and whether they exist and whether or not they are desirable. Transhumanism thus demands practical investigation or "the quest to develop further so that we can explore hitherto inaccessible realms of value" (Bostrom 2005a, 9).[10] The transhumanist view of the human and its possible modes of being has (at least) two expansionary consequences for a conception of suffering. First, it expands the scope of contemporary human suffering. Second, it implies an inconceivable posthuman manifold of suffering.

First, to consider the human as what technologically might come to be is to confront what it is currently not. As Bostrom (2005a) puts it, the "limitations of the human mode of being are so pervasive and familiar that we often fail to notice them, and to question them requires manifesting an almost childlike naiveté" (5). Transhumanism thus reveals dimensions of suffering that are not typically regarded as such, or are treated as necessary burdens to bear rather than problems to ameliorate. Death is perhaps the most dramatic of these, semantically supercharged as it is by millennia of religious and secular apologetics. Transhumanist gerontologist Aubrey de Grey (1999) contrarily refers to death not as an eternal condition of human existence but as "negligible senescence" which could be overcome by engineering (189). But there are also more prosaic forms of suffering, such as a scholar's mental incapacity to retain everything she's read and written, especially in light of the failure of a hard drive that was not backed up. While, as Nietzsche would likely point out, it would be undesirable to have flawless memory, few academics, at least, would object to an increased capacity.

Secondarily, since the vast majority of transhumanists do not believe in achieving a state of perfection, the expansivity of suffering implies that they believe that

any future modes of posthuman being will come with their own, likely currently inconceivable, dimensions of suffering. If it is the case that the human "cognitive makeup may foreclose whole strata of understanding and mental activity" (Bostrom 2005a, 6), then the dark side of posthuman modes of being is an expanded conception of suffering as privation or deformation of those very modes. The possibility of suffering will always be renewed as the human transforms into a posthuman state. While Kurzweil's rather religious Singularitarian transhumanism spends little time considering this sort of possibility, it is implicit in the open-endedness of transhumanism. More cautious transhumanists thus advocate "careful, incremental exploration of the posthuman realm" (Bostrom 2005a, 9) rather than full throttle acceleration into the future.

In sum, transhumanist suffering demonstrates the temporal inversion I have extracted from Marx and Soper. Applied to Timpanaro's pessimism, it extrudes it from a barrier into a path. An infrastructural conception of suffering drawn from the contemporary human is projected into the indefinite future of the human that builds itself. Contemporary forms of suffering imposed by nature are not natural facts that are to be heroically, yet fruitlessly, assailed. Instead, they are to be investigated as contingencies which might be overcome, without any expectation of a perfected state awaiting at the end of history. Transhumanist suffering thus compels one to adopt a posture of perpetual negation towards the existing world, rather than accepting, at an arbitrary point, its current state as natural. A posture of negation is not foreign to Marxism. It has a long history of directing negation at social relations, but it has forgotten how to negate the putatively natural.

Conclusion: The Ruthless Criticism of Nature

In a letter to his friend Arnold Ruge, Marx (1843) described a distinction between his own perspective on communism and that of the "dogmatists." He held that it should be admitted that no one has an "exact idea what the future ought to be" and that therefore "we do not dogmatically anticipate the world, but only want to find the new world through criticism of the

---

10 Considering transhumanism's predominantly favourable appraisal of capitalism, this might be provocatively interpreted to mean "hitherto inaccessible realms of surplus-value," though Bostrom intends value in a more general sense here.

old one." Although undeniably advocating a futural perspective, Marx put the exact details of the future beyond an event horizon. He went on to suggest an immediate goal of the "*ruthless criticism* of all that exists, ruthless both in the sense of not being afraid of the results it arrives at and in the sense of being just as little afraid of conflict with the powers that be" (Marx 1843, emphasis original). However, Marxism has tended not to subject nature to ruthless criticism.[11] Nature, and the suffering imposed by it, have been accepted as, well, *natural*. Marxism neglected its latent transhumanism and it was left to the transhumanists to ruthlessly critique nature.

To conclude, I consider how one might conduct the ruthless criticism of nature by drawing on Werner Bonefeld's negationary Marxist approach. Like most Marxists today, Bonefeld is not concerned about what Timpanaro called the oppression of nature, but rather with suffering imposed socially by the domination of capital. Yet, his striking language offers a convenient means, if shifted to the context of the oppression of nature, to articulate its ruthless criticism. Bonefeld (2014) refers to communism as the "society of human purposes," highlighting its connection to human volitional evolution (226). Like Marx, he refuses to positively define communism, asserting that it "can be defined in negation only" (Bonefeld 2014, 226). The society of human purposes represents a historical rupture; it "stands in opposition to all hitherto history" (Bonefeld 2014, 220). What Bonefeld calls critical theory, and what Marx might have called ruthless criticism, can only be critical if it:

> refus[es] to be taken in by a philosophy of progress that in its entirety is tied to existing social relations. It therefore refuses to 'sanction things as they are.' Its conception of society is entirely negative. … It therefore does not sign up to the idea of a progressive future. Instead, its 'objective goal is to break out of the context from within.' … Its reality is entirely negative (Bonefeld 2014, 221).

For Bonefeld, communism is wholly alien to our contemporary, inverted world of capital. Thinking that

aims to achieve such a new way of social being can only begin by negating the existing world. Bonefeld's negatory salvo could easily be redirected against nature, as the notion of transhumanist suffering shows us. How is it possible that Marxists endorse the current state of suffering imposed by nature today as natural? Should not a Marxist goal be to *denaturalize nature*, just as it is to denaturalize religion and capital? What is desirable in nature cannot be decided in advance, but only by collective humanity investigating its technological and social options and implementing them, or not. Pearce (1995) argues that the technological abolition of suffering will eventually become a "social policy issue. Passively or actively, we will have to *choose* just how much unpleasantness we wish to create or conserve … in eras to come."[12] Materialism, whether transhumanist, Marxist, or both, should refuse to accept, without collective investigation, whether our diverse sufferings are indeed inevitable or desirable. Ray Brassier (2014) puts it well: "we should be very wary of anyone telling us our suffering means something" (481).

Musing on a definition of wealth under communism, Marx describes a situation where the human "strives not to remain something he has become, but is in the absolute movement of becoming" (Marx 1993, 488). A materialist perspective entails this processual view of the human as that which produces itself. Marxism has rightly pointed out this self-productive aspect of humanity and how it is inhibited and directed towards stupid ends by capital and religion. The transhumanism of Marxism, latent for a while now, entails that nature's obstruction of the self-production of humanity should also be recognized. Such a Marxism might be conceived, in words borrowed by Timpanaro from his favourite poet Giacomo Leopardi, as a "great alliance of intelligent beings opposed to nature" (quoted in Timpanaro 1979, 49). A denaturalized nature would appear, alongside capital and religion, as an enemy of humanity.

---

11 This is not to say that Marxism has not considered the question of nature; there are many excellent examples of that (Vogel 1996; Burkett 1999; Foster 2000; Schmidt 2014). What I mean is that Marxism tended not to approach nature with the initial attitude of total negation it directs towards capitalist and religious social relations.

12 An interesting avenue for future research concerns delineating which forms of suffering are in fact necessary. Bostrom (2005a) points out that while we can likely transcend "many of our biological limitations" there might be "some limitations that are impossible for us to transcend, not only because of technological difficulties but on metaphysical grounds" (8). The possibility, for instance, that all matter, including the human brain and body, moves in ways rigorously determined by its previous states, and hence that agency is wholly illusory, is a great source of suffering to many, including pessimist horror author Thomas Ligotti (2012), for whom it is a central trope.

References

Anderson, Perry. 1989. *Considerations on Western Marxism*. London: Verso.

Bailes, Kendall E. 1978. *Technology and Society under Lenin and Stalin: Origins of the Soviet Technical Intelligentsia, 1917-1941*. Princeton: Princeton University Press.

Benanav, Aaron, and John Clegg. 2018. "Crisis and Immiseration: Critical Theory Today." In *The SAGE Handbook of Frankfurt School Critical Theory*, edited by Beverly Best. Werner.

Bernal, JD. 1929. *The World, The Flesh, and the Devil*. Bloomington: University of Indiana Press.

Bonefeld and Chris O'Kane. London: SAGE. 1629-48.

Bonefeld, Werner. 2014. *Critical Theory and the Critique of Political Economy: On Subversion and Negative Reason*. London: Bloomsbury.

Bostrom, Nick. 2005a. "Transhumanist Values." *Journal of Philosophical Research* 30: 3-14.

Bostrom, Nick. 2005b. "A History of Transhumanist Thought." *Journal of Evolution and Technology* 14 (1).

Bostrom, Nick. 2008. "Letter from Utopia." *Journal of Evolution and Technology* 19 (1): 67-72.

Brassier, Ray. 2014. "Prometheanism and its Critics." In *#accelerate#: The Accelerationist Reader*, edited by Robin Mackay and Armen Avanessian, 467-488. Falmouth: Urbanomic.

Brickman, Philip and Donald Campbell. 1971. "Hedonic Relativism and Planning the Good Society." In *Adaptation Level Theory: A Symposium*, edited by M. H. Apley, 287–302. New York: Academic Press.

Brown, Nathan. 2016. "Avoiding Communism: A Critique of Nick Srnicek and Alex Williams' Inventing the Future." *parrhesia* 25: 155-171.

Burkett, Paul. 1999. *Marx and Nature: A Red and Green Perspective*. New York: St. Martin's.

Cheng, Yinghong. 2009. *Creating the New Man: From Enlightenment Ideals to Socialist Realities*. Honolulu: University of Hawaii Press.

de Grey, Aubrey. 1999. *The Mitochondrial Free Radical Theory of Aging*. Austin, TX: R.G. Landes Company.

Dombroski, Robert S. 2001. "Timpanaro in Retrospect." *Italica* 78 (3): 337-350.

Dyer-Witheford, Nick. 2004. "1844/2004/2044: The Return of Species-Being." *Historical Materialism* 12 (4): 3-25.

Foster, John Bellamy. 2000. *Marx's Ecology: Materialism and Nature*. New York: NYU Press.

Fracchia, Joseph. 2005. "Beyond the Human-Nature Debate: Human Corporeal Organisation as the 'First Fact' of Historical Materialism." *Historical Materialism* 13 (1): 33-61.

Guevara, Che. 2005. "Socialism and man in Cuba." *The Che Reader*. London: Ocean. First published 1965.

Heinrich, Michael. 2004. *An Introduction to the Three Volumes of Karl Marx's Capital*. New York: Monthly Review Press.

Hughes, James J. 2007. "The Compatibility of Religious and Transhumanist Views of Metaphysics, Suffering, Virtue and Transcendence in an Enhanced Future." *The Global Spiral* 8 (2).

Hughes, James J. 2012. "The Politics of Transhumanism and the Techno-millennial Imagination, 1626–2030." *Zygon* 47 (4): 757-776.

Humanity+. 2009. "Transhumanist Declaration". https://www.humanityplus.org/the-transhumanist-declaration.

Huxley, Julian. 1957. *New Bottles for New Wine*. London: Chatto & Windus.

Idhe, Don. 2010. "Of Which Human Are We Post?" In *H+/-: Transhumanism and its Critics*, edited by Gregory R. Hansell. Xlibris Corporation.

Istvan, Zoltan. 2018. "Transhumanism is Under Siege from Socialism." *The Maven*. https://www.the-maven.net/transhumanistwager/transhumanism/transhumanism-is-under-siege-from-socialism-UzA2x-HZiFUaGOiUFpc0n5g/

Kamenka, Eugene. 1969. *Marxism and Ethics*. New York: St. Martin's Press.

Kurzweil, Ray. 2005. *The Singularity is Near: When Humans Transcend Biology*. New York: Viking.

Laboria Cuboniks. 2018. "Xenofeminism: A Politics for Alienation." https://laboriacuboniks.net/wp-content/uploads/2019/11/20150612-xf_layout_web.pdf

Ligotti, Thomas. 2012. *The Conspiracy Against the Human Race*. New York: Hippocampus.

Lukács, György. 1971. *History and Class Consciousness: Studies in Marxist Dialectics*. Cambridge, MA: MIT Press.

Mackay, Robin and Armen Avanessian. 2014. *#accelerate#: The Accelerationist Reader*. Falmouth: Urbanomic.

Mahootian, Farzad. 2012. "Ideals of Human Perfection: A Comparison of Sufism and Transhumanism". In *Building Better Humans? Refocusing the Debate on Transhumanism*. Edited by Hava Tirosh-Samuelson and Kenneth L. Mossman. Frankfurt am Main: Peter Lang.

Marx, Karl. 1843. "Marx to Ruge." Letters from the Deutsch-Französische Jahrbücher. Marxists.org. https://www.marxists.org/archive/marx/works/1843/letters/43_09.htm

Marx, Karl. 1990. *Capital Volume I*. New York: Penguin.

Marx, Karl. 1991. *Capital Volume III*. New York: Penguin.

Marx, Karl. 1993. *Grundrisse*. New York: Penguin.

Marx, Karl. 1978a. "Economic and Philosophic Manuscripts of 1844." In *The Marx-Engels Reader*, edited by Robert C. Tucker. New York: Norton.

Karl, Marx. 1978b. "Marx on the History of his Opinions (Preface to *A Contribution to the Critique of Political Economy*)." In *The Marx-Engels Reader*, edited by Robert C. Tucker. New York: Norton.

Merrifield, Andy. 1999. "Notes on Suffering and Freedom: A Marxian and Dostoevskian Encounter." *Rethinking Marxism* 11 (1): 72-86.

Mészáros, István. 1970. *Marx's Theory of Alienation*. London: Merlin Press.

More, Max. 2010. "True Transhumanism." In *H+/-: Transhumanism and its Critics*, edited by Gregory R. Hansell. Xlibris Corporation.

Murphy, B.J. 2018. "Why the Transhumanist Movement Needs Socialism." *Medium*. August 17. https://medium.com/s/story/why-the-transhumanist-movement-needs-socialism-b1601ff13ccb

Noonan, Jeff. 2016. "The Debate on Immortality: Posthumanist Science vs. Critical Philosophy." *The European Legacy* 21 (1): 38-51.

Pearce, David. 1995. *The Hedonist Imperative*. Posted online. https://www.hedweb.com/hedethic/tabconhi.htm

Pearce, David. 2007. "The Abolitionist Project." https://www.abolitionist.com/

Peters, John Durham. 2015. "Infrastructuralism: Media as Traffic between Nature and Culture." In *Traffic: Media as Infrastructures and Cultural Practices*. Edited by Marion Naser-Lather and Christoph Neubert. Leiden: Brill.

Postone, Moishe. 1993. *Time, Labor, and Social Domination: A Reinterpretation of Marx's Critical Theory*. Cambridge: Cambridge University Press.

Schmidt, Alfred. 2014. *The Concept of Nature in Marx*. London: Verso.

Schopenhauer, Arthur. 2010. *The World as Will and Representation Volume 1*. Cambridge: Cambridge University Press.

Smith, Adam. 1961 [1776]. *An Inquiry into the Nature and Causes of The Wealth of Nations*. London: Methuen.

Sohn-Rethel, Alfred. 1978. *Intellectual and Manual Labour: A Critique of Epistemology*. London and Basingstoke: Macmillan.

Soper, Kate. 1979. "Marxism, Materialism and Biology." *Issues in Marxist Philosophy* 2: 61-99.

Srnicek, Nick, and Alex Williams. 2015. *Inventing the Future: Postcapitalism and a World Without Work*. London: Verso.

Steinhoff, James. 2014. "Transhumanism and Marxism: Philosophical Connections." *Journal of Evolution and Technology* 24 (2):1-16.

Timpanaro, Sebastiano. 1975. *On Materialism*. London: NLB.

Timpanaro, Sebastiano. 1979. "The Pessimistic Materialism of Giacomo Leopardi." *New Left Review* 116: 29-50.

Timpanaro, Sebastiano. 1993. "On Materialism". In *Design and Aesthetics: A Reader*, edited by Jerry Palmer and Mo Dobson. London and New York: Routledge.

Thacker, Eugene. 2015. *Cosmic Pessimism*. Minneapolis: Univocal

Tirosh-Samuelson, Hava. 2018. "In Pursuit of Perfection: The Misguided Transhumanist Vision." *Theology and Science* 16 (2): 200-222.

The Transhumanist FAQ. nd. https://whatistranshumanism.org/.

Trotsky, Leon. 1957. *Literature and Revolution*. New York: Russel & Russel.

Verdoux, Philippe. 2009. "Transhumanism, Progress and the Future." *Journal of Evolution and Technology* 20(2): 46-69.

Vita-More, Natasha. 2020. "The Transhumanist Manifesto". https://humanityplus.org/transhumanism/

Vogel, Steven. 1996. *Against Nature*. SUNY.

Vohra, Ashok. 1983. "The Notion of Suffering in Buddhism and Marxism." *Dialectics and Humanism* 10 (4): 97-101.

Vygotsky, Lev. 1994. "The Socialist Alteration of Man." In *The Vygotsky Reader*, edited by R. van de Veer and J. Valsiner. London: Blackwell. First published in 1930.

Wendling, Amy E.. 2009. *Karl Marx on Technology and Alienation*. Basingstoke/New York: Palgrave Macmillan.

Wilson, Edward O. 1998. *Consilience: The Unity of Knowledge*. New York: Knopf.