

The Dialectics of the Biosocial: Addressing Ontological Dualism and Contemplating Transhumanism

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ABSTRACT: In the context of a critical review of the assumptions of the philosophical and cultural movement known as ‘Transhumanism,’ this paper addresses the difficult question of what is human nature, or the nature of being human. And, whether this ‘nature’ is purely a phenotypic quality shared with all biological life, and as such open to biological modification and transformation? Or does human nature constitute a quite different and unique set of attributes? What Marx identified as ‘species being,’ characterised by a very different understanding of transformation, that of productive activity or praxis.

KEYWORDS: Species Being, nature, ontological dualism, praxis, materialist monism, transcendentalism

Introduction: ‘Transformations’

Transhumanism is the name badge adopted by the cultural and philosophical movement concerned with enhancing humanity through emergent bio- and information technologies. Whilst this is a broad coalition, it would appear to share little common ground with the objectives of revolutionary Marxism, not least because of its generally uncritical approach to the commodification of human biomaterial. The question posed in this paper is whether it is possible to look beyond the contradictory impulses underpinning many of the manifestations of transhumanism, in order to engage with the implications of its key concern, the technological acceleration of the evolutionary development of humanity? Or to put it another way, is a transhumanist future understood

in terms of the transcendence of human biological limits so that all may live a life free of debilitating illness and able to maximise their cognitive potential, so far removed from the socialist ideal of achieving a common creativity and purpose, free from the forced demands of labouring for necessities and wants?

Assessing the idea of human transformation necessarily focuses attention on the relationship between the human and the natural, and how this has traditionally been conceptualised in Western Philosophy. Liberal humanism, which has been the dominant theme of such discourses since the Enlightenment, represents human nature as a quality quite distinct from, if not antagonistic to, nature per se. It was arguably the development and expansion of the capitalist system

of commodity production from the late eighteenth century onwards that gave material form to Descartes' original binary myth of nature as external, controllable, and reducible. Nature was to be distinguished from the realm of the social, wherein humanity was presented as its opposite, non-reducible, rational, and having free will. But for Marx, the concern was less the question of how society and nature related to one another, than how these two aspects of the whole ever got separated in the first place? In addressing this form of ontological dualism, Marx's philosophy of praxis sought to identify the historical conditions that led to the construction and reproduction of this form of idealism, and in doing so charted a very different materialist understanding of human history.¹

In critically examining the transhumanist goal of overcoming human-nature dualism, this paper assesses the monistic assumptions that underpin visions (both humanist and anti-humanist) of an enhanced and directed evolutionary pathway for humanity. The paper is therefore required to pose a number of foundational questions such as what constitutes human nature, and what is the nature of being human? Is human 'nature' a phenotypic quality, one that is open to biological and technological mediation, or does it constitute a quite distinct and unique set of attributes, a 'species being'? The latter is the conception that Marx drew upon in elucidating his own materialist understanding of the capacity of human productive activity or praxis to bring about social transformation. This analysis of transhumanism is therefore interwoven with an assessment of Marx and Engel's own understanding of the dialectical unity of nature and humanity.

Humanism, Marxism, and Ontological Dualism: A Brief Sketch

Western humanist thought, stretching back as far as the Enlightenment, has traditionally represented the human condition as shaped 'by the existence of two

distinct ontological spheres of reality, the material-natural and the cultural-ideational, presented as 'incommensurable and absolutely distinct from one another' (Smith 2009, 376). This form of dualism was manifest in Descartes' separation of the human mind and corporeal body, with the latter described as a 'statue, an earthen machine.' While for Kant, reason served to draw a line between 'facts and values' ('what is' and 'what ought to be'), so separating humanity from the external world of nature. Outside of reason, nature was deemed by Kant to simply be a 'thing-in-itself' with no inherent causal powers. Emergent in the early nineteenth century, the hegemony of ontological dualism subsequently became institutionalised within the social structures of civil society. These social institutions served to legitimize and reproduce the social inequalities that formed the bedrock for capitalist relations of production, as both necessary and non-transformable. Value rationality and the material world of the commodification of labour and the exploitation of natural resources were presented as distinct and unconnected one from another (Smith 2009, 360-363). The social and environmental problems that were seen to arise 'indirectly' from the relations of production, were therefore presented as potentially amenable to resolution through progressive scientific and technological processes of innovation, in combination with a system of moral education.

By the early twentieth century, logical empiricist philosophy or 'positivism' had emerged to challenge the Kantian notion of *a priori* understanding, and in doing so sought to promote the idea of a 'unified scientific method' that could be applied to the understanding of both social and natural phenomenon. Yet where the methods of positivism were applied by natural scientists to explain aspects of the human world, then the result has typically been the subversion and reduction of the social to the natural. As such, Positivist science has long been criticised as inadequate to an understanding not only of the social world but also the complexities of the natural world. The 'unified' methodology of science has had little or nothing to say about the social and political biases of scientists that are carried into the laboratory. It was

1 It should be stated at the very beginning of this paper, that there will be no engagement with the theoretical anti-humanism of Louis Althusser and the debates of the 1960s concerning whether there was indeed an 'epistemological break' between the Hegelian humanism found in 'early' Marx of the *Thesis on Feuerbach* and the 'late' Marx of *Capital*. These debates were arguably academically sterile at the time, and remain so today.

not until the last decades of the twentieth century, that the commodification of science research and innovation began to be seriously questioned.

In marked contrast to this ontological dualism, Marx understood that human beings have always evolved and interacted with the world that surrounds them, and in turn, transformed nature through its collective productive labour. In *The German Ideology*, he set about dismantling idealist representations of humanity as separate and distinct from nature. By presenting the relationship between humanity and nature in dialectical-materialist terms, Marx also reflected the historically shifting modes and relations of production: “The unity of man with nature has always existed in industry and has always existed in varying forms in every epoch according to the lesser or greater development of industry” (Marx 1974, 63). Two decades later, in *Capital* (Volume 1), Marx states that: “Labour is, first of all, a process between man and nature, a process by which man, through his² own actions, mediates, regulates and controls the metabolism between himself and nature” (Marx 1976, 283). It is on this basis that human labour should be understood as much a physical quality that interacts with its environment, as it is the ‘social substance’ of labour power. Here, Marx utilises the notion of ‘species being’ to draw attention to this combination of corporeal bodily properties interacting with an external nature that can be controlled through labour power.

However, humanity becomes separated from praxis within the capitalist social relations of production. The human capacity to reflect and act upon the natural and social world becomes distorted, resulting in an emergent process of alienation from species being. As Marx explains in the *Economic and Philosophical Manuscripts*: “Estranged labour turns man's species-being, both nature and his intellectual species powers (*consciousness*), into a being alien to him and a means of his individual existence. It estranges man from his own body, from nature as it exists outside of him, from his spiritual essence, his

human essence” (Marx 1975, 328, italics not in original). While in *Capital* (Volume 3), he explains that the capitalist relations and conditions of production mediate the interdependence of the material-natural and human conscious activity or agency, “provok[ing] an irreparable rift in the independent process of social metabolism, a metabolism prescribed by the natural laws of life itself” (Marx 1981, 949). So it follows that the process of alienation, a concept reflective of Marx’s humanist conceptualisation of the dialectical contradictions that underpin capitalist relations of production; is “at one and the same time the estrangement of humanity from its own laboring activity and from its active role in the transformation of nature” (Foster 2000, 73).

Yet Marxist thinking post-Marx, has not been immune to its own dualist assumptions. The Second Communist International was characterised by its representation of historical materialism as a purely disinterested study of the economic contradictions of capitalism. And, even by the 1950s and 1960s, many influential Marxist thinkers continued to assert the view that it was economic forces that ‘overdetermined’ the actions and the course of human history, presenting the natural and physical aspects of human existence as mere epiphenomenon. This form of economism, often combined with an uncritical scientism and technophilia, had an undue influence within Marxist politics throughout much of the twentieth century. The failure to build upon Marx and Engel’s own dialectical understanding of the relationship between nature and society frequently led to an uncritical endorsement of the untrammelled benefits of technological innovation and industrial expansionism for human progress.

However, in more recent decades, arising from a greater awareness of the social and environmental consequences of unrestrained technological expansionism and the over-exploitation of natural resources, there has been a return by many socialists to Marx’s and Engel’s original critique. Rather than replicating the purely mechanical criticism of what capitalism is doing to nature that is posed by the environmentalist movement, which inadvertently reinforces the separation of nature and society, the dialectical legacy

2 Marx’s use of gendered pronouns are clearly representative of the norms of his time. Outside of direct quotations, I have attempted to be consistent in my use of gender inclusive pronouns when they are required.

of Marx poses a different set of questions concerning the unification manifest in the understanding of capitalism-in-nature and nature-in-capitalism; “this allows us to grapple with a new set of relations, hitherto obscured by the dualism of Nature/Society” (Moore 2015, 13).

Overcoming Dualism (1): The Transhumanist Pathway

We now move onto a consideration of the key components of transhumanist philosophy and its key objective of enhancing and transforming the ‘natural’ dimensions of humanity. The constituents of ‘trans,’ used as a prefix to indicate a journey from one state to another, is the focus of debate within a range of ontological and epistemological thought. But for transhumanism, a loosely defined cultural and intellectual movement that embraces the potential of biotechnologies, artificial intelligence, and robotics, ‘transformation’ is understood as a ‘redesigning’ of humanity beyond the limits of its current biological constraints.

Transhumanism as both a philosophy and an ideological³ movement, first came to prominence in the early 1990s. But its antecedents lie firmly within classic humanism, and the idea of a progressive process of cultural and educational human refinement. This is a movement very much concerned with the human capacity for self-determination built on rational and ethical principles, but going beyond classic humanist objectives in both means and ends. As such, it has been described as an ‘intensification’ of humanism (Wolfe 2010, xv). The promotion of a technologically engineered acceleration of bio-evolutionary processes, with the goal of achieving an enhanced ‘human-machine,’ can be read as a distinct form of ‘technological singularity.’ Singularity is generally referred to as the state of being achieved when advances in science and technology have reached the point when cognitive enhancement of humans becomes indistinguishable from that of artificial intelligence. According to the futurologist

Ray Kurzweil, who has been credited with advancing this concept, a transhumanist technological evolution represents the continuation of biological evolution to the point at which biology is itself transcended (Kurzweil 2006). It was the sequencing of the whole human genome achieved in 2003, which in turn led onto exponential advances in bioinformatics and the emergence of innovative biotechnologies, that is frequently identified as the point at which human biological transformation moved from being an ideal to a potential reality.

One of the interesting aspects of the genealogy of transhumanist ideas is its link to the emergence of the science of cybernetics, and its association with the early development of space exploration programmes of the early 1960s. In this context, the term ‘Cyborg’ was first proposed by two research scientists in an article that appeared in the journal *Astronautics* in 1960. It was stated that “for the exogenously extended organisational complex functioning as an integrated homeostatic system unconsciously, we propose the term ‘Cyborg’” (Clynes and Kline 1960). The notion of the cyborg anticipated the mechanical adaptations to the human body that were seen as necessary for humans to be able to survive in the hostile and challenging environment of outer space. It is on the basis of this understanding of cyborgism as technological enhancement, rather than the popularist twentieth century notion of the ‘man-machine,’ that the notion of transhumanist technologies can also be understood (Ranisch and Sanger 2014).

Max More, a leading libertarian advocate for an enhanced evolution of humanity, has argued that as a ‘philosophy of life,’ transhumanism must at all times be guided by “life-promoting principles and values” (More 1990). It is on this basis that an ethical transhumanism must also engage “with the study of the ramifications, promises, and potential dangers of technologies that will enable us to overcome fundamental human limitations, and the related study of the ethical matters involved in developing and using such technologies” (More 2013, 3). Here the value that is accorded to human rationality by transhumanism is linked to a programme with the objective of “developing and making widely available technologies

3 Following Gramsci, ideology is conceived here not in the negative, as in a false or inverted version of reality (‘false consciousness’), but positively, as an explanation of reality and that seeks to actively bring about change (see also Larrain 1983).

to eliminate aging and greatly enhance human intellectual, physical, and psychological capacities” (More 2013, 5).

For More, transhumanism represents an ideological commitment to shift the hegemonic axis of classic humanism from a dualist introspection to a monistic future: “Where creatures with similar levels of sapience, sentience, and personhood are accorded similar status no matter whether they are humans, animals, cyborgs, machines, or aliens” (More 2013, 13). It is a philosophy that is wedded to a belief in the capacity to progress science and technology to the point at which humanity itself is able to transcend and escape its bonds of materiality and embodiment. That is, a desire to overcome human limits through reason and science, reflecting “a Promethean drive to extend life and increase cognitive capacity” (Young 2005). As such, it can be seen as a humanist philosophy of praxis, but one that rejects traditional dualist categories while embracing a “materialistic monism” (Harman 1998, cited in Naude 2009). This would be a monism predicated on an ontological conception of the universe as consisting solely of matter and energy, combined with the materialist epistemologies of engineering, biology and informatics to construct a technological pathway to human transformation.

Overcoming Dualism (2): Whither the Posthuman Condition?

Alongside a materialistic monism, Harman (1998) also recognised what he termed ‘transcendental monism’ which he linked to a metaphysical interpretation of the trajectory of modern science and technology. This is a form of transcendentalism is associated with ‘matter-energy,’ but not as a material quality of the universe, rather as arising from within, a mind-consciousness: “In this context, consciousness is not seen as the end-product of material evolution but rather consciousness gave rise to the material world” (Naude 2009, 52). Such transcendentalism is arguably a defining feature of many of the 57 varieties of poststructuralist thinking that have coalesced around the notion of the ‘posthuman condition.’ While there are those who embrace anti-humanism and challenge any suggestion of transcendentalism

(for example, see the discussion of Bradotti’s work below), many post-structuralist thinkers are less reticent about their commitment to transcendentalism. Cary Wolfe (2010) for example, devotes a whole chapter in his posthumanist primer to discussing the work of Ralph Waldo Emerson. This is a generally supportive piece that directly acknowledges the influence of Emerson’s ‘romanticised’ critique of modernity as it emerged in the nineteenth century. Wolfe argues that Emerson “directs us not to an ordinary, fixed self-substance (human subjectivity) but toward a *power* and a *process*, not toward the past but toward the future, or rather towards futurity itself, conceived as a horizon ... for the self *only* exists in its becoming” (Wolfe 2010, 248; italics in original, the text in parenthesis is not in original).

Those who recognise the potentiality of a ‘post-human condition’ (from this point on I will use the shorthand ‘posthumanism’) generally share with transhumanism the perception of the human as “a non-fixed and mutable condition...following the onto-epistemological as well as scientific and biotechnological developments of the twentieth and twenty-first centuries” (Ferrando 2013, 26). While both positions share in common the notion of ‘technogenesis,’ a coevolution of technology and humanity, what they do not share is the ontological assumption that human enhancement achieved through the application of science and technology constitutes a transcendence of humanity per se. Posthumanists see the technological pathway as nothing more than the continuation of the failed humanistic project of ‘universalism.’ In contradistinction, the point at which the ‘post-human’ is seen as consummated is the ‘historical moment’ when what it is to be human has become ‘decentred’ from past humanist ideals. Wolfe identifies this moment as the point at which “new modes of thought” emerge as a consequence of our “imbrication in technical, medical, informatic, and economic networks,” and in opposition to the “philosophical protocols and evasions of humanism as a historically specific phenomena” (Wolff 2010, xvi).

While for the philosopher Rosi Braidotti, the ‘post-human’ is realised when the dualism of nature (‘the given’) and culture (‘the constructed’) has been

‘displaced and blurred’ by the cumulative impact of scientific and technological advances that enable a “self-organising (or auto-poetic) force of living matter” to emerge (Braidotti 2013, 3). Braidotti’s position is more self-consciously anti-humanist and therefore anti-transcendentalist, than that of Cary Wolfe. In her reading of what she describes as the ‘post-anthropocentric turn,’ Braidotti draws on Spinoza by way of Deleuze, in adopting a philosophical monism characterised by a ‘vitalist materialism.’ Here matter (the world and humans) is conceived as whole, not as dualistic entities structured according to principles of internal or external opposition (Braidotti 2013, 56). As she herself notes, while Spinoza’s philosophy was for a very long period of time regarded simply as ‘holistic’ and ‘politically ineffective,’ this interpretation changed in French philosophical circles in the 1960s. Deleuze, Foucault, and Lacan, all drew on Spinoza’s philosophy with the intent to “overcome dialectical oppositions, and engendering non-dialectical understandings of materialism ... to define matter as vital and self-organizing ... rejecting all forms of transcendentalism” (Braidotti 2014, 170). One interesting aside here, is that Louis Althusser, the doyen of 1960s ‘structuralist Marxism’ (briefly alluded to above) acknowledged his own debt to Spinoza’s ‘determinist philosophy’ (Thomas 2002, 73).

If transhumanist philosophy is concerned with the techno-scientific enhancement of human beings, then posthumanism emphasises the techno-scientific possibilities of mediating what it is to be ‘human’ at all. For Braidotti, developments in genetic engineering and associated biotechnologies have led onto “a qualitative conceptual dislocation in the contemporary classification of embodied subjects, ... bodies reduced to their informational substrate in terms of materiality and vital capacity” (Braidotti 2013, 97). What she identifies as emergent ‘techno-cultures’ are projected as ultimately submerging antagonistic ‘dualistic’ (class-based) politics. This is because they are seen to “destabilize the categorical axes of difference” upon which existing capitalist power relations are constructed. The “decentering of anthropocentrism” is said to result in a new interconnectivity between the human and “non-human,” the latter held to be a

self-organising hybrid life force, evolving (but not in the Darwinian sense) across a nature-culture continuum (Braidotti 2013, 98). She is however careful not to deny the power of capitalism to opportunistically commodify the “informational power of living matter itself,” a process she describes as the “capitalization of living matter” (Braidotti 2013, 65). But this era of ‘biocapitalism’ is deemed to be ultimately unsustainable because it is seen as predicated on a materiality and individualist subjectivity that lack any relevance for an emergent non-human form of life.

Postulating posthuman futures, whether of the Wolfe or of the Braidotti variety, is typically post-structuralist in its adoption of a flat ontology that conflates causal powers and human agency. As such posthumanism rejects any notion of a voluntarist social transformation, whether that be manifested as a technologically engineered transhumanism, or a collectively organised resistance to the contradictions of the capitalism system. For these anti-humanists, voluntarism is problematised because it is seen to represent the privileging of the human over the non-human. Yet, as the critical realist Doug Porpora has noted, “there is a difference between who we are phenomenologically and what we are ontologically” (2015, 144). That is, while the original concerns of poststructuralist theory may have been to challenge Cartesian dualism and bounded human identities, manifested as posthumanism, it can be seen as rejecting almost entirely the idea of enduring personhood linked to materiality. As such it denies the possibility of critical agency in any process of transformation. Ultimately, therefore, the process of ‘posthumanisation’ appears to be contingent on the same ‘techno-transcendence’ that is elsewhere described by Braidotti as a “misleading tendency” linked to “a consumerist brand of individual liberalism” (2013, 97).

Overcoming Dualism (3): Conceiving ‘Biosociality’ in a Post-Genomic World

Within the field of the biosciences, the 1990s witnessed a shift from whole gene-based theories to DNA-based theories and chemical-molecular models of structure and function. Essentially this marked the transition from traditional genetics to modern genomics that cul-

minated in the sequencing of the whole human genome in 2003. The subsequent exponential growth in what are now collectively known as ‘omics sciences’ represent this new comprehensive rather than partial approach to analysing genetic or molecular human profiles. These developments in ‘post-genomic’ bioscience are linked to therapeutic as well as human enhancement promissory discourses. Therapeutics would include advances in the field of pharmacogenomics associated with delivery of ‘personalised’ medicine, while the human enhancement aspects are linked with the development of genetic engineering techniques and the potential to modify inherited human germlines (Almeida and Diogo 2019).

One key area of development within post-genomic science is the field of environmental epigenetic research concerned with the complex mechanisms of cell identity and processes of cell differentiation. Epigenetics has acquired a significant public profile not least because of “a number of provocative propositions that have caught the attention of the wider public and scientists alike” (Müller *et al.* 2017, 1677). One of the most significant is the conceptualisation of the material environment existing outside of the human body as ‘bioactive,’ leading to the speculative claim that the science of epigenetics could bring to an end the nature and nurture dichotomy. What is indisputable is that developments in post-genomic science have undermined the traditional biomedical model that sought to separate-out ‘exterior’ environmental health risks, from ‘interior’ or genetic risk factors. This form of medicalised dualism has long served to reinforce the notion of disease susceptibility as primarily an individual trait, despite the existence of well-understood epidemiologically identifiable social and economic determinants of health.

As we have seen in the discussion above, many of those who have pursued a transhumanist or posthumanist intellectual pathway have sought to cite the innovations arising from post-genomic bioscience in support of their distinctive monistic philosophies. This has also been the case for those who look to Foucault’s notion of ‘biopower’ to make the case for the emergence of a new order of ‘technologies of self.’ Biopower in its original form has been defined as those

strategies that encompass, “knowledge of vital life processes; power relations that take humans as living beings as their object; and the modes of subjectification through which subjects work on themselves qua living beings” (Rabinow and Rose 2006, 215). In the post-genomic context, biopower is now presented as offering the opportunity for individuals to attain the hitherto unrealised potential, “to transform themselves in order to attain a certain state of happiness, purity, wisdom, perfection, or immortality” (Foucault 1988).

But neo-Foucauldian theory goes much further than highlighting the post-genomic contribution to an understanding of the complexities of human material-natural corporeality. It also identifies an emergent transformation of humanity, a hybridization of the personal, the cultural and the biological. Paul Rabinow and Nick Rose are two of the most well-known proponents of a transformatory process they have termed ‘biosociality.’ But this is not so much a version 2.0 of Foucault’s foundational concept of biopower, but rather is drawn upon as a heuristic that stands in for a radical reappraisal of humanity: “As beings whose individuality is, in part at least, grounded within our fleshly, corporeal existence, and who experience, articulate, judge and act upon ourselves in part in the language of biomedicine” (Rose 2007, 26). Dualism is seen as overcome at the point at which post-genomic science enables the human body to be treated as an “ethical substance” to be worked on to secure a healthier future (Rose 2007, 49). This is a future predicated not so much on the availability and efficaciousness of biomedical interventions, as one which has effected a shift in knowledge-power such that individuals now have the knowledge and crucially the means, to act on information about their personal genetic susceptibilities (their ‘somatic individuality’), to effect their self-transformation. In relation to the future promise of epigenetic science, Nick Rose has claimed that, “[it] marks a recognition of the inseparability of vitality and milieu which could give a crucial role for the social and human sciences in accounting for the shaping of vitality at the molecular level” (Rose 2013, 19).

But there is a caveat, and this concerns the social and economic processes through which the

‘knowledge-power’ (of post-genomic science and technology) is to be realised. Pálsson (2009) has taken this up in terms of the alienation of human relationality that is seen to arise from the commodification of the “natural capacities of the body” through the application of new technologies in an emergent biosocial relations of production. This is a self-declared attempt to marry Foucauldian and Marxian frames of analysis in assessing the impact of these new modes for the “extraction, reproduction and exchange of bodily material” resulting in the creation of what is termed “biocapital.” Pálsson begins his analysis by pointing to the ways in which Marx represented the capitalist labour process of the British factory system in the early nineteenth century as a technical mastery over nature. The consequence being a suppression of the natural constituents of humanity as the capitalist labour process transforms the worker into a “living appendage of the machine” (Marx 1976, 614). But in the context of an emergent productive system of ‘biocapital,’ the very bodies of workers become the object of the labour process. Here Pálsson identifies contemporary limits to an unproblematic application of a Marx’s key concept.

Pálsson cites Marx’s reference (in the *Economic and Philosophical Manuscripts*), to “nature as ‘inorganic body’; that is to say nature *excluding the human body itself*” (2009, 297, emphasis added).⁴ This quote is interpreted to mean that Marx inadvertently reinforces a dualist

understanding of the relation between humanity and nature which becomes problematic in the context of a post-genomic mastery over the production and reproduction of human body parts. These developments are seen to “mudd[y] the clear distinction between things external to our bodily selves and those intrinsic to us. ... With that come difficulties that Marx did not have to confront about what is alienable and what is inalienable from the subject” (Dickinson 2007, 29 cited in Pálsson 2009, 298). The development of a new “biosocial relations of production” is seen to have “revolutionized our capacity to analyze and reproduce bodily material, raising new and fundamental questions as to what constitutes ‘life,’ ‘nature’ the ‘human, and ‘animal’” (Pálsson 2009, 308). This position argues that the technological ability to exploit genetic material, human tissue, and other bio-information constitutes a substantively new form or mode of capitalist production, wherein humans have become indivisible object and subject of the labour process. Certainly over the past two decades there has been an exponential development of ‘biobanks’ that serve as repositories of donated human tissue and DNA for research purposes, and there have been many instances of commercial transactions involving this donated biodata. But do these developments really constitute a new mode of production requiring an extension of Marx’s conception of species-being in which human labour power is now conceptualised as “molecular, cellular, enzygmatic, and genetic” (Pálsson 2009, 302)?

In this section, we have assessed how the Foucauldian notion of ‘biopower’ has been drawn upon in asserting that post-genomic science and associated biotechnologies represent a new ‘power-knowledge’ orientation, enabling new forms of cultural, economic and biological hybridisation to arise. In seeking to move away from Cartesian dualism, these accounts make the false assumption that scientific innovation achieved through the force of human intellect is the prime mover of value creation and social transformation. This form of a priori thinking leads onto a voluntarist and anti-materialist framing of human biological and social advancement, that despite claims to the contrary, fail to break decisively with dualism.

⁴ The translation of the *Economic and Philosophical Manuscripts* that is drawn on by Pálsson is the 1959 Moscow-based Progress Publishers edition. It translates the relevant passage as follows: “Nature as inorganic body, that is to say nature excluding the human body itself.” Pálsson uses the term ‘inorganic body’ to imply a separation from nature as humanity develops the tools to exploit its resources and transform itself into the ‘inorganic’ world of machines and technology. But if the full quote from *Economic and Philosophical Manuscripts* is examined rather than this partial quote it gives a clearer sense of Marx’s original meaning: “Nature is man’s inorganic body, that is to say nature in so far as it is not the human body. Man lives from nature, i.e nature is his body, and he must maintain a continuing dialogue with it if he is not to die. To say that man’s physical and mental life is linked to nature simply means that nature is linked to itself, for man is a part of nature” (Marx 1975, 328). This citation is taken from the later Gregor Benton translation in the 1975 Penguin edition which refrains from the use of the term ‘exclusion.’ On this basis, there is no separation of an inorganic, technised human labouring machine from the natural world which would enable Pálsson to claim with any justification that Marx demonstrates a dualistic understanding of the human body. Although Marx drew an analytical distinction between ‘inorganic’ humanity and nature, this is made precisely in order to emphasise the evolved acquisition of the tools/means of production used to gain control over nature.

The Dialectics of Nature: Challenging Ontological Dualism

In his critique of Kantian rationalism, Hegel argued that in seeking to transform the world (strictly at the level of thought) we must first engage with the potential contradictions of our existing cognitions of that world, and in the process, transform ourselves. But for Marx, dialectical materialism was the ‘exact opposite’ of Hegel’s idealistic dialectic, arguing (in the *Postface to the 2nd Edition of Capital*) that, “the ideal is nothing but the material world reflected in the mind of man and translated into forms of thought” (1976, 102). Dialectical materialism is a realist ontology that acknowledges the existence of an autonomous external and physical world, while recognising the essential relationality of the social and natural worlds. Marx embraced materialism as an active, not a contemplative principle, on the basis that we create “our own distinctly human-natural relations” through our “material praxis” (Foster 2000, 5). Writing in 1880, Engels notes in *Socialism: Utopian and Scientific* that

nature is the proof of dialectics, and it must be said for modern science that it has furnished this proof with very rich materials increasing daily and thus has shown that in the last resort. Nature works dialectically and not metaphysically; that she does not move in the eternal oneness of a perpetually recurring circle, but goes through a real historical evolution. (Marx and Engels 1968, 407)

Written over 140 years ago, this position (and the series of notes written by Engels and published after his death in the 1930s as the ‘*Dialectics of Nature*’) stands as an emphatic challenge both to ontological dualism and to essentialist conceptions of nature as life-force. Engels understood that dialectical thinking is as necessary to the comprehension of natural world processes as it is to an understanding of praxis within the social world.

A key principle of Darwinian evolutionary theory (given due regard by both Marx and Engels) is that nature is a complex system possessing ‘emergent properties.’ So that while there are well understood causative biological processes at work,

for example genetic inheritance, the immersion of these mechanisms within complex natural and social environments can result in unpredictable forms with as yet unknown properties. Darwin’s understanding of the process of evolution of organic life is therefore one of both interaction and contradiction. That is, a set of processes that is as likely to result in negation or the non-adaptive (so-called evolutionary ‘blind alleys’), as it is the adaptive process of ‘natural selection.’ For Engels, this demonstrated that Darwin’s theory was in essence a materialist dialectic applied to the natural world. Nature was an organic totality that could only be understood through an analysis of the dynamic interplay of its parts, just as the parts could only be understood by examining their interaction with the whole. Dialectic thinking directs attention to the processes of development through which these parts come to constitute the whole, and why it is that the parts may take on emergent forms that may be quite distinct from their pre-existing state.

A dialectics of nature raises the question as to whether humans as biological organisms should be conceived as objects of natural evolutionary processes beyond their control, or whether in fact we are emergent subjects of these processes with the capacity to respond proactively to our environment? Eight years after the publication of Darwin’s *Origin of the Species*, Marx was writing in *Capital* about the ways in which human evolution could be traced through the development of tools much more pertinently than the fossil record: “This was because tools represented the development of human productive organs, the evolution of the human relation to nature” (Foster 2000, 201). A hundred and fifty years later, the view that the evolution of human beings is linked to our application of technologies is now a mainstream position within paleontology. And, while debates continue to revolve around the extent to which particular aspects of speech, language, and cognitive processing can be directly attributed to “technological praxis,” the “plausibility of these evolutionary links” is now generally accepted (Stout and Chaminade 2012).

In 1985, the biologists Richard Levins and Richard Lewontin, published a collection of their essays entitled *The Dialectical Biologist*, in which they

presented the idea of the organism as both subject *and* object of evolution, and in particular the role that the organism plays in its own evolution. To quote from one of the essays: “An organism does not compute itself from its DNA. The organism is the consequence of a historical process that goes on from the moment of conception until the moment of death; at every moment gene, environment, chance, and the organism as a whole are all participating. ... Natural selection is not a consequence of how well the organism solves a set of fixed problems posed by the environment; on the contrary, the environment and the organism actively codetermine each other” (Levins and Lewontin 1985, 89). This collection included a series of case studies that sought to demonstrate how biological organisms respond to the particular aspects of their immediate surroundings that are most relevant for their needs. This was in response to the fact that while Darwin himself had placed great emphasis on the ways in which organisms responded to changes in their environment, the post-Darwinian history of biology was seen as having been characterised by the attempt to identify these evolutionary forces as somehow internal to the biological organism, without reference to any external material interactive process. Indeed, up until the post-genomic turn in biology at the beginning of the twenty-first century, the focus was very much on the transmission of nuclear DNA from one generation to the next as constituting a pre-determined path of evolution. Maurizio Meloni has termed this approach ‘hard-heredity,’ while recognising in environmental epigenetics a return to what he terms ‘soft-heredity.’ The latter is the approach that emphasises the role of the broader mechanisms of non-genetic inheritance: “A different style of reasoning ... a radical rethinking of the ontology of the genome and even a dismissal of its role as the prime mover in biological processes” (Meloni 2016, 191).

Throughout his published work, Marx remained committed to a dialectical conception of nature, wherein materialism constituted both an ontological and epistemological category of understanding. At the level of ontology, this was manifest as a realist acknowledgement of the existence of an external, physical world independent of thought. While at the

epistemological level, Marx recognised the unilateral dependence of the social and the human on biological or physical being, the former emerging from the latter (Foster 2000, 6). This was an understanding of the processes of natural history that was neither deterministic nor mechanistic. It is also a position quite distinct from the ‘flattened’ ontology and epistemology found in both transhumanism and posthumanist thought that frequently represents the relationship between humanity and nature in terms of pure teleology.

A Marxist Materialist Monism and the ‘Biosocial’

Constructing a critique of the materialist monism of transhumanism and its assumption of an evolutionary technological singularity is not a mere exercise in philosophical posturing. It requires us to positively engage with Marx’s own materialist monistic understanding of the ‘natural’ productive capacity of humans. That is, the legacy of Marx’s materialist and dialectical ontology that frames humanity’s collective ability to forge its own distinctly non-teleological revolutionary pathway.

In Thesis I of his *Thesis on Feuerbach*, Marx rejects Feuerbach’s materialism on the basis that it is marked by a dualism, where “the thing, reality, sensuousness, is conceived only in the form of the object or of contemplation, but not as sensuous human activity, practice, not subjectively” (Marx 1975, 421). While in Thesis III, Marx goes on to state that

The materialist doctrine concerning the changing of circumstances and upbringing forgets that circumstances are changed by men and that it is essential to educate the educator himself. ... The coincidence of the changing of circumstances and of human activity or self-changing can be conceived and rationally understood only as *revolutionary practice*. (Marx 1975, 422, italics in original)

The human activity of practice or mediation is therefore central to what has been described as Marx’s own monistic materialist ontology (Mészáros 2005, 87). But this is not a monism of individual ‘human essence’ abstracted from historical and natural processes. For Marx, human essence exists as a

material reality constituted as “the ensemble of the social relations ... [where] all social life is essentially *practical*” (Marx 1975, 423, italics in original). While Marx analytically differentiates between the human subject and the object of activity, this is a distinction that in reality is mediated by practice. A dialectical unity constituted by the social relations of production as they play out within an historical and materially grounded ‘objective totality.’

In Marx’s materialist conception of history, real living individuals are conceived as ‘the true subject of history.’ The course of human relations, from one historical stage to the next, is seen to reflect choices made and actions undertaken, but always contingent on material circumstances. To cite Marx’s celebrated statement which opens *The Eighteenth Brumaire of Louis Napoleon*: “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 1968, 96).

In contrast, the material monism of transhumanist which claims to be both organic and non-organic/machine in orientation, it is in practice a teleological version of human history culminating in an anticipated ‘end of humanity’ that is incapable of escaping the embrace of the dualism it claims to overcome. As such it can be described as a philosophy of ‘contemplation’ that is unable to escape the logic of its implicit anti-realism. While in reference to its assumption of technological linearity, Alondra Nelson, whose work has focused on the idea of an ‘Afrofuturism,’ has noted in a recent interview that:

There is psychic comfort in linearity; it makes us feel like we’ve harnessed the world, that we’ve got control over the world. Linearity makes it possible for one to get caught up in a sense of inevitable social, political progress. ... I think part of the trauma of living under the raw racism, misogyny, and xenophobia of the Trump era derives from feelings of stalled progress and doused expectations. From an overinvestment in a progress narrative – particularly with regards to racial politics, issues of gender equality and equity – without sufficient attention to the fact that there’s the falling backward as much as there are leaps forward, and understanding that that is an inevitable part of the social dynamic. The great mythos of American

life is the idea that we’re always improving, always moving forward. And the great story of science and technology is that it is also always leaping forward to good ends. (El-Hadi 2020)

While talk of the necessity of moving backward as well as forward does not constitute an embrace of a dialectic understanding of history per se, the situation described by Nelson does acutely identify the contradictions that underpin capitalist ideologies of ‘progress.’ As the philosopher Sean Sayers has argued:

A complete and revolutionary social transformation is needed before our present alienation can be overcome and before we can begin to be at home with our own powers and creations. Only then will we finally be able to recognize that the “genie” of our technology and industry is in fact an emanation of *ourselves* – of our own powers and selves in alienated form. And only then will we be in a position to begin to take conscious social control of these powers and use them in a free and conscious way for our own real benefit. (Sayers 2005, 615)

While transhumanism is able to recognise the human capacity for technological innovation and scientific progress in its goal of liberation from bodily limits, it is incapable of acknowledging the ways in which this same capacity has also been deployed in the exploitation of humanity and the natural environment that we share in common with all life. This is reflective of the essential ahistoricism of transhumanist philosophy. Yet, the recognition that bodily limits and constraints are not fixed is a position that socialists should not easily dismiss. Post-genomic science, and in particular the field of environmental epigenetics, is increasingly (and inadvertently) providing the evidence of the ways in which the human body is constituted and interpenetrated by the social and economic relations of production under capitalism. This new understanding of what constitutes the ‘biosocial’ under capitalist relations of production offers a further basis on which to challenge the oppressive system we all live within. But ultimately it is not biological and cognitive transformation that will liberate human productive and creative potential; alienation and dualism can only be overcome in the overturning and transforming of the capitalist system of production.

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