



POSTHUMAN LIFE

Philosophy at the Edge of the Human

DAVID RODEN

ROUTLEDGE



Posthuman Life

We imagine posthumans as humans made superhumanly intelligent or resilient by future advances in nanotechnology, biotechnology, information technology and cognitive science. Many argue that these enhanced people might live better lives; others fear that tinkering with our nature will undermine our sense of our own humanity. Whoever is right, it is assumed that our technological successor will be an upgraded or degraded version of us: Human 2.0.

Posthuman Life argues that the enhancement debate projects a human face onto an empty screen. We do not know what will happen and, not being posthuman, cannot anticipate how posthumans will assess the world. If a posthuman future will not necessarily be informed by our kind of subjectivity or morality, the limits of our current knowledge must inform any ethical or political assessment of that future. *Posthuman Life* develops a critical metaphysics of posthuman succession and argues that only a truly speculative posthumanism can support an ethics that meets the challenge of the transformative potential of technology.

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To Marika Zeimbekis, life partner and friend.

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Introduction

Churchland's centipede

Mankind's a dead issue now, cousin. There are no more souls. Only states of mind.

(Sterling 1996: 59)

In his autobiography, Bertrand Russell describes witnessing the philosopher Alfred Whitehead's wife, Evelyn, undergoing great physical pain: "She seemed cut off from everyone and everything by walls of agony, and the sense of the solitude of each human soul suddenly overwhelmed me." Russell portrays this event as akin to a religious conversion. It convinced him that the immense gulf between human beings could only be bridged by selfless love. Having been an imperialist, he was now persuaded that war was wrong and "that a public school education is abominable" (Russell 2009: 137).

Maybe not all of us are as profoundly affected by others' suffering. But Russell's evocation of our loneliness rings true. Surely the expression "I feel your pain" is a self-serving euphemism. Whatever consolation we offer, it seems, the other's pain is theirs alone.

This melancholy insight is supported by an abstract claim about the privacy of conscious experience that most philosophers and lay people seem to accept (Hirstein 2012: 6–7). Even if my empathy is at the Russellian end of the scale, I cannot feel your pain because each experience is unique to the one who has it. Where experiences are qualitatively similar, they are distinct tokens of the same type. I cannot have your experience of hearing Nirvana's "Smells Like Teen Spirit" on your blue MP3 player, though I might have qualitatively identical sensations listening to a cloned MP3 on my pink player.

Things change. We can imagine humans acquiring new technological powers, like the ability to hear dog whistles or withstand the cold vacuum of space. But can we imagine how one could experience the pleasures, pains or thoughts of another? Nothing, it seems, can alter the essential human solitude Russell expresses so eloquently.

Well, maybe not quite nothing.

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In *Consciousness Explained*, Daniel Dennett defines “Philosophers’ Syndrome” as: “mistaking a failure of imagination for an insight into necessity” (Dennett 1991: 401). Perhaps we cannot imagine what it would be like to experience the pleasures and pains of another. But I cannot imagine how it feels to be an octopus either, though there is presumably something this feels like. So perhaps Russell’s “insight” into the essential privacy of consciousness is just an artefact of philosophers’ syndrome rather than a necessary truth.

Here’s a quick and dirty refutation of the privacy thesis adapted from William Hirstein’s book *Mindmelding* (Hirstein 2012: 3). Its first premise is a relatively weak version of materialism, which states that all mental states are identical to physical states:

- 1) All mental states are identical to physical states, as materialists claim.
- 2) *No physical state is private.*

Conclusion: no mental state is private.

(QED)

Clearly, this is much too fast! Some modern dualists claim that physical states have irreducibly subjective properties, so Premise 2) is ambiguous. Others might object that the privacy thesis is so secure that if materialism implies its falsity, then materialism has to go.

But denying the privacy of mental states in this context only means denying that they are *necessarily* private. It may be a contingent fact about humans that they cannot experience the mental states of others. Perhaps the solitude that Russell describes could be dissolved, not by universal love this time, but by a technology that allows brains to share experiences with other brains.

In a seminal article published in 1981, six years after Russell’s autobiography, the philosopher Paul Churchland notes that some human beings are born without a *corpus callosum* – the thick trunk of nerve fibres that allows the cerebral hemispheres of most humans to exchange information. This genetic condition – known as callosal agenesis – is remarkable because its sufferers do not experience significant deficits. Callosal agenesis only shows up in brain scans or surgical procedures. There is no conventional treatment because there does not need to be. Somehow, Churchland reasons, the two hemispheres have learned to share information without this major artery of interhemispheric communication. But if two parts of a human brain can learn to communicate, he asks, might not the same be possible for two or more spatially distributed brains? He proceeds to outline what such an artificial “neural commissure” would be like:

[Let] us suppose that we can fashion a workable transducer for implantation at some site in the brain the research reveals to be suitable, a transducer to

convert a symphony of neural activity into (say) microwaves radiated from an aerial in the forehead, and to perform the reverse function of converting received microwaves back into neural activation. Connecting it up need not be an insuperable problem. We simply trick the normal processes of dendritic arborization into growing their own myriad connections with the active microsurface of the transducer.

Once the channel is opened between two or more people, they can learn (learn) to exchange information with the same intimacy and virtuosity displayed by your own cerebral hemispheres. Think what this might do for hockey teams, and ballet companies, and research teams! If the entire population were thus fitted out, spoken language of any kind might well disappear completely, a victim of the “why crawl when you can fly?” principle. (Churchland 1981: 88)

Evidence from the effects of lobotomies and opiates suggests that areas of the frontal cortex are involved in feeling the unpleasantness of pain, whereas discriminations of the nature and location of pain depend on activity elsewhere in the somatosensory cortex (Hardcastle 2001). Suppose that a Churchland commissure has been fitted between the pain discrimination centres in person A’s head and the pain evaluation centres in person B’s head. Following a “tuning period”, the commissure now emulates the patterns of stimulation that would normally occur between Person B’s pain evaluation centres and her own pain discrimination centres (Hirstein 2012: 157–8). If all this is in place and B kicks A in the shin, she (or her frontal cortex) should feel the affective backwash of A’s pain. Both cry out in response! If such affective tuning became obligatory in Churchland’s neuroculture, not only would libraries and spoken language become things of the past, but violence too. A world in which human brains are suffused in microwaved harmony might be kinder than ours: a Neurotopia with particular excellences in team sports and performing arts.

Perhaps the solitude that Russell saw as definitive of the human condition can be overcome by Brain–Machine–Brain Interfaces (BMBIs) that duplicate the functions of our home-grown commissures (*ibid.*: 161–2).

There is evidence that such technologies may soon be with us. For example, a recent scientific report details an experiment in which brain activity in a rat trained for a simple lever-pressing task was encoded and passed down the internet to an untrained “encoder rat” via a Brain–Machine Interface (BMI) – significantly improving the untrained rat’s score on the same task (Pais-Vieira *et al.* 2013; see also §1.3). Of course, we do not know that these technologies will fulfil Churchland’s happy dreams or others’ nightmares. But current work on neuroprostheses at least holds out this prospect. Perhaps the much-vaunted privacy of human

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consciousness is as technology-dependent as our now dated inability to fly from Paris to New York.

But here's a different perspective on Neurotopia.

Perhaps mental privacy *is* an invariant of human beings. The citizens of Churchland's neuroculture lack this (technology-dependent) property of mind, and thus no longer qualify as human. Neurotopia is an alien civilization whose members are only outwardly similar to human beings. For example, suppose that they share not just perceptual states, such as toothaches, but agency. In this case, evaluations and decisions would be networked between the frontal areas of A's head and B's head, and perhaps between many others. So the inhabitants of Neurotopia would be corporate "human centipedes" whose agency and consciousness is distributed between modified human bodies. With centipedal thinkers, the agency and subjectivity we associate with discrete bodies bleeds into multiply embodied superorganisms.

As Hirstein remarks, there might be analogies between sharing pains using a neural commissure and our empathic responses to witnessing others' pains (Hirstein 2012: 161).

However, while we might imagine feeling the pain and pleasure of another, it is not clear that you or I can imagine our agency distributed over many bodies. There is a sense in which humans *are their bodies*. We experience the world from a single embodied perspective. We die when our bodies die. In contrast, human bodies would be dispensable segments of centipedes. For a centipede, the death of a body would mean the loss of a processing-effector node. This might be traumatic (for reasons that might be best appreciated from its multi-bodied perspective) but not terminal. The centipede's long-term memory and overall goals would need to be available to different bodies just as sensory information is shared between our cerebral hemispheres by the *corpus callosum*. For humans, bodily death is inevitable. For centipedes, the death of the multiple could be deferred so long as the supply of appropriately tooled bodies keeps up.

If we adopt the second perspective on Churchland's neuroculture, we must infer that the centipedes are descendants of humans *that are no longer human as a consequence of technological alteration*.

In contemporary culture, the most common term for such technologically wrought nonhumans is "posthuman". Science fiction writers like Philip K. Dick, Cordwainer Smith, Bruce Sterling and William Gibson have trafficked in posthumans of various sizes and shapes for nearly a century (Sterling's 1996 novel *Schismatrix* is the first fiction in which the word is employed self-consciously). However, Gibson and Sterling have proved to be in the conceptual avant-garde, with commentators from other disciplines running to catch up. Since the mid-1990s, serious

discussion of posthumans has migrated from science fiction to contemporary discourse in bioethics, critical theory, and even to mass media discussions of the long-run implications of advanced technology.

The last point is key to understanding the aims of the present work, I think. In 1818 Mary Shelley could imagine Victor Frankenstein giving life to his creature by obscure, semi-magical means (Graham 2002: 73–7). Now, technologies with the potential to engender posthuman successors to humans may be in the alpha phase. The creation of cybernetic hook-ups between organisms or between organisms and machines is just one example of a possible posthuman-maker. Research in artificial intelligence has produced systems that exhibit a certain independence from human decisions, though not yet in systems whose flexibility and fluidity approaches that of higher animals. Elsewhere, developments in biological sciences may lead to some descendants of humans acquiring physical capacities far beyond the human norm, such as effective resistance to ageing. Some even propose that the long-run future of intelligent beings will be as immortal “uploaded” minds running on vastly powerful computer systems (see my discussion of “soul engines” in §1.3).

Moreover, a number of well supported positions in cognitive science, biological theory and general metaphysics imply that a posthuman succession is possible in principle, even if the technological means for achieving it remain speculative. This is because they converge on the view that modest materialism is basically right: capacities for self-consciousness, language and information processing that distinguish us from nonhumans depend on physical facts about our bodily organization and environment such as the absence of inter-cranial commissures (§2.1). When it becomes possible to technologically intervene in that organization, the higher-level subjective and social properties that depend on it may become fundamentally altered.

For many philosophers and ethicists, the combination of these incipient technological trajectories with the modest claim that subjectivity depends on alterable arrangements of matter suggests that posthuman succession is not merely imaginable but may be possible in the near or medium future (Agar 2010; Fukuyama 2003).

Throughout this work I refer to the philosophical claim that such successors are possible as “speculative posthumanism” (SP) and distinguish it from positions which are commonly conflated with SP, like transhumanism (§1.2). SP claims that *there could be posthumans*. It does not imply that posthumans would be better than humans or even that their lives would be compared from a single moral perspective.

The formulation of SP is problematic, however, and not just because it refers to hypothetical technologies whose precursors may never exist. For example, my argument for the posthumanity of the centipedes presupposed

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that mental privacy was an essential property of humans: a property that something could not lack and be human.

But the assertion that there is a human essence is one that many philosophers – including most avowed “posthumanists”, I suspect – have good reason to reject. Becoming posthuman in the sense that I have articulated it presupposes that there is some matter of fact about being human in the first place. But what kind of fact is it? Is being human really just a matter of satisfying a checklist of essential properties? Thus any philosophical theory of posthumanism owes us an account of what it means to be human such that it is conceivable that there could be nonhuman successors to humans.

The notion of succession is also problematic. Posthumans, such as Churchland’s centipedes, might not be human, but my account assumes that they would be “descendants” of current humans in some sense. This historical-succession relation requires urgent clarification, given that the processes of descent relevant to SP may be unknown to current biology.

Understanding how the relation human–posthuman should be conceptualized is key for understanding SP’s epistemic scope. Are there ways in which we can predict or constrain posthuman possibility based on current knowledge? Some philosophers claim that there are features of human moral life and human subjectivity that are not just local to certain gregarious primates but are necessary conditions of agency and subjectivity everywhere. This “transcendental approach” to philosophy does not imply that posthumans are impossible but that – contrary to expectations – they might not be all that different from us. Thus a theory of posthumanity should consider both empirical and transcendental constraints on posthuman possibility.

What if it turns out that these constraints are relatively weak?

In that case, the possibility of posthumans implies that the future of life and mind might not only be stranger than we imagine, but stranger than we can currently conceive.

This possibility is consistent with a minimal realism for which things need not conform to our ideas about them. But its ethical implications are vertiginous. Weakly constrained SP suggests that our current technical practice could precipitate a nonhuman world that we cannot yet understand, in which “our” values may have no place.

Thus while SP is not an ethical claim, it raises philosophical problems that are both conceptual and ethical-political.

Conceptually, it requires us to justify our use of a term “posthuman”, whose circumstances of application are unknown to us. Does this mean that talk of “posthumans” is self-vitiating nonsense? Does speaking of “weird” worlds or values commit one to a conceptual relativism that is incompatible with the commitment to realism?

If posthuman talk is not self-vitiating nonsense, the ethical problems it raises are very challenging indeed. If our current technological trajectories might result in the world turning posthuman, how should we view this prospect and respond to it? Should we apply a conservative, precautionary approach to technology that favours “human” values over any possible posthuman ones? Can conservatism be justified under weakly constrained SP and, if not, then what kind of ethical or political alternatives are justifiable?

The goal of *Posthuman Life* is to define these questions as clearly as possible and to propose some philosophical solutions to them. Although it would be hubristic for a writer on this topic to claim the last word, my formulations do, I hope, provide a firm conceptual basis for philosophical and interdisciplinary work in this area.

I attempt to achieve this by exploiting contributions of divergent philosophical traditions. As I mentioned, an appreciation of the scope of SP requires that we consider empirically informed speculations about posthumans and also engage with the tradition of transcendental thought that derives from the work of Kant, Hegel, Husserl and Heidegger. It requires a discussion of the implications of intellectual tendencies that oppose transcendental thinking such as philosophical naturalism and certain varieties of poststructuralism, anti-humanism and deconstruction. This ecumenism is justified because none of these traditions are suited to tackling the full range of problems that arise from SP on their own. For example, philosophers working in the Anglo-American tradition such as Dennett and Churchland make claims about time and the contingency of subjectivity that are interpreted at higher levels of conceptual abstraction in work of poststructuralists such as Derrida and Deleuze. At certain points, SP needs to frame its assumptions at this level of generality (see [Chapters 4, 6 and 7](#)).

This continental-analytic approach imposes expository obligations on those of us who work within it. We cannot presume that all our readers will be equally familiar with terms like *différance*, “supervenience”, “deterritorialization”, *Dasein* or “radical interpretation”. So I apply the rule that all key concepts should be explained in terms accessible to a reader unfamiliar with the relevant traditions or discourses. The result is doubtless longer than it might have been, but hopefully more through-argued and accessible to cross-disciplinary audiences than it could otherwise have been.

Here is the plan of the book in summary. *Posthuman Life* begins by explaining some key concepts in debates over posthumanism and the ethics of technological enhancement – “humanism”, “anthropocentrism”, “posthumanism” and “transhumanism” – in [Chapter 1](#).

[Chapter 2](#) is also partly clarificatory. It considers whether the anti-humanist arguments propounded by so-called “critical posthumanists”

undermine futurist accounts of the posthuman like SP. It argues that they do not and, in so doing, clarifies the metaphysical commitments of both SP and critical posthumanism.

Chapters 3 and 4 focus on the transcendental critique of SP. Chapter 3 sets up the critique by co-opting the work of Immanuel Kant, Edmund Husserl, Martin Heidegger, Donald Davidson and Hilary Putnam. Chapter 4 criticizes the transcendentially constrained version of SP from a position that is simultaneously naturalistic and deconstructive.

Chapter 5 addresses the conceptual problems of posthumanism described above by articulating a theory of human–posthuman difference in terms of the “disconnection thesis”.

The disconnection thesis is the theoretical core of *Posthuman Life*. It provides a usable but epistemically modest definition of posthumanity. It highlights our ignorance of the circumstances that might attend a human–posthuman divergence. All the ethical ramifications of speculative posthumanism come from this insight; for it implies that the posthuman can only be understood by making or becoming posthumans.

The final four chapters of the book develop the metaphysical and political implications of the disconnection thesis.

Chapter 6 develops a psychology-free account of agency that allows us to conceptualize posthuman agency without pre-empting the nature of posthuman minds. This is ethically significant in highlighting the disruptive implications of human–posthuman disconnection. Here and elsewhere I employ the resources of the assemblage metaphysics developed in the work of Gilles Deleuze, Felix Guattari and Manuel DeLanda to formulate minimal conditions for posthuman agency and posthuman becoming.

Chapter 7 develops a theory of technology – “new substantivism” – which disarms humanist conceptions of technology as an instrument of human reason. It implies that agency in technological systems is a problematic negotiation with circumstances liable to be unchosen or unanticipated. This account of technological systems frames the concluding discussion of Chapter 8, in which I argue that there is no humanist or “anthropocentric” argument that weighs decisively against making or becoming a posthuman. The place of posthuman ethics, I argue, is not to hand down moral rules to technologists, scientists and politicians but to develop systems which aid us in the intelligent and skilful carving of futures.

I Humanism, transhumanism and posthumanism

Introduction

The terms “humanism”, “transhumanism” and “posthumanism” are widely used among philosophers, critical theorists and professional futurists, but often in ways that are insufficiently nuanced.

For example, Neil Badmington and Katherine Hayles have criticized the “apparently posthumanist aim” of downloading consciousness onto computers, arguing that it is symptomatic of a kind of hyper-humanism which replicates the dualist fiction of an immaterial and autonomous human subject described in Descartes’ metaphysics (Badmington 2001: 5–6). Badmington proposes a different – *critical* – posthumanism as a philosophical corrective to humanism. Rather than dreaming of the uploaded minds or intelligent robots to come, critical posthumanism attempts to understand and deconstruct humanism from within, tracing its internal tensions and conceptual discrepancies.

As we shall see over the next two chapters, the main problem with this analysis is not that the deconstructive project pursued by Badmington, Hayles and others is intellectually fruitless but that it conflates two very different kinds of futurist speculation. The first belongs to a *transhumanist* itinerary for the perfection of human nature and the cultivation of human personal autonomy by technological means. Transhumanism is thus an ethical claim to the effect that technological *enhancement* of human capacities is a desirable aim (all other things being equal). The second kind of futurism – *speculative posthumanism* (SP) – is not a normative claim about how the world *ought to be* but a metaphysical claim about *what it could contain*. For speculative posthumanists, posthumans are technologically engendered beings that are no longer human. SP makes no commitments regarding ethical value of posthuman lives. It does not, for example, define the posthuman as an improvement or apotheosis of the human as transhumanist philosopher Nick Bostrom does in “Why I Want to be a Posthuman When I Grow Up” (2008).

The suppression of genuine *post-human* possibilities in both critical posthumanist and transhumanist is an important philosophical failure and

not simply a semantic oversight. If SP is true, there could be posthumans. This possibility is arguably a matter of concern to current and future humans, whose technological activities might bring them into being (see [Chapters 5 and 8](#)).

To understand the ramifications of SP, then, we need to get clear about the distinction between transhumanism and the various critiques of humanism grouped under the portmanteau term “posthumanism” (see [§1.4](#)). In addition to speculative posthumanism and critical posthumanism, I will identify two other positions – speculative realism and naturalism – whose critiques of anthropocentric assumptions are equally important to the debates that inform this book.

As we shall see over the next three chapters, humanism itself has been poorly analysed by many who see it as part of their academic job description to “critique” and seek out alternatives to it. All forms of posthumanism criticize human-centred (anthropocentric) ways of understanding life and reality. However, not all forms of humanism are equally anthropocentric or are anthropocentric in the same way. Many self-styled posthumanists regard Descartes’ dualist distinction between a self-transparent human mind and a world governed by strict mechanical laws as the touchstone of modern humanism. Yet, Cartesian dualism imposes fewer anthropological constraints on the nature of things than the transcendental philosophies of subjectivity promulgated by Kant and his successors. *Transcendental humanism* does not only privilege the human ethically (as humanists like Aristotle and Pico della Mirandola are wont to do) but treats certain abstract features of human life and subjectivity as unsurpassable sources of order in the world.

For now, let us set about our distinction-mongering.

1.1 Humanism and anthropocentrism

The word “humanist” has many uses and meanings. For example, it sometimes refers to those who advocate the dignity of all human beings bestowed by their shared moral nature, or to those who eschew religious morality in favour of a morality grounded in human affections and activities.

While such ideas will figure in our discussion of posthumanism and (most importantly) the nature of posthumans, they will be less central than philosophical conceptions of the difference between humans and nonhumans. So rather than appealing to common usage, I will simply stipulate the generic senses in which the terms “humanism” and “anthropocentrism” will be used throughout the book.

A philosopher is a *humanist* if she believes that humans are importantly distinct from non-humans and supports this distinctiveness claim with

a *philosophical anthropology*: an account of the central features of human existence and their relations to similarly general aspects of *nonhuman* existence.

A humanist philosophy is *anthropocentric* if it accords humans a superlative status that all or most nonhumans lack.

These definitions are not intended to be subtle or historically nuanced. They are intended to highlight what all humanisms must have in common. If a philosophy lacks a philosophical anthropology, it cannot be humanist. If it does not allocate special status to humans, it is not anthropocentric. Crudeness is a philosophical virtue where it helps pinpoint important similarities and differences.

As used here, “humanism” applies to theists who believe in gods or a God and to anti-theists who reject or have no interest in them. In *Existentialism and Humanism*, Jean-Paul Sartre argues that human existence precedes its essence. This means that humans are radically free and self-defining agents whose existence is prior to any concept of what they ought to be (Sartre 1948: 2–3). Sartre’s account of radical human freedom draws on his atheism. Since there is no God, he reasons, humans are unlike paper knives or hammers in having no fixed function or purpose. Humans are thus whatever they make of themselves through their actions.

However, in his *Oration on the Dignity of Man*, the Renaissance philosopher Pico della Mirandola grounds a very similar human capacity for self-fashioning in an essential “lack” granted by God at the moment of creation:

I have placed you at the very centre of the world, so that from that vantage point you may with greater ease glance round about you on all that the world contains. We have made you a creature neither of heaven nor of earth, neither mortal nor immortal, in order that you may, as the free and proud shaper of your own being, fashion yourself in the form you may prefer.

(della Mirandola 1948: 5)

My definition of “anthropocentrism” is similarly general.

Not all human–nonhuman distinctions are anthropocentric. It is not anthropocentric to claim that humans are the only animals that drive cars or the only hairless primates. These claims provide individuating descriptions of humans but they do not award us special honours in the world order.

Moreover, not all humanisms are anthropocentric in the same way or to the same degree. Aristotelian ethics provides a good example of moderate anthropocentrism. In his *Nicomachean Ethics* Aristotle claims that, among living things, only humans are responsive to reason (NE 1098a). Rationality

allows humans to bypass or suppress emotions and desires and to cultivate socially endorsed dispositions such as courage, generosity and friendship. The fact that I can distinguish between principles like equality and freedom, for example, allows me to see these as alternative principles of conduct.

Aristotle privileges humans by attributing reason exclusively to human animals. This means that there are goods – such as friendship or the contemplation of metaphysical truths – that only humans can aspire to. He also suggests in the *Politics* that there is a hierarchy of beings ordered in terms of their degree of rationality such that the less rational serve the needs of those further up the hierarchy of rationality (*Pol* 1.81256b16-22; Lee 2003: 8).

Nonetheless, Aristotle allows that nonhuman living beings have goods corresponding to their nature. Animals seek pleasures, but neither animals nor gods can exhibit human moral virtues (*NE* 1153b, 1145a). As Keekok Lee argues, this anthropocentrism is less aggressive than those expressed in modern philosophical positions that assert that human subjects are the only source of value and meaning in the world (Lee 2003: 9).

The vision of a “disenchanted” world lacking an intrinsic or human-independent moral order is commonly laid at the door of seventeenth-century scientist-philosophers such as Descartes and Galileo who argued that the world is governed only by mathematically expressible laws and not, as the Aristotelians held, by purposes or “final cases” (Sandel 1998: 175). However, the proponent of radical anthropocentrism whose influence is most enduring is the eighteenth-century philosopher Immanuel Kant. Kant inaugurated a philosophical perspective that I will refer to throughout this book as “transcendental humanism”. Transcendental humanists claim that humans do not merely represent the world but actively organize it, endowing it with value, form or meaning (§3.3).

Kant also claims that nothing in nature is intrinsically good. Only beings that are rational and capable of autonomous agency can be regarded as “ends-in-themselves”. Lacking reason, animals can only be means to human ends:

The beings whose existence rests not on our will but on nature nevertheless have, if they are beings without reason, only a relative worth as means, and are called *things*; rational beings, by contrast, are called *persons*, because their nature already marks them out as ends in themselves, i.e., as something that may not be used merely as means, hence to that extent limits all arbitrary choice (and is an object of respect).

(Kant 2002: 46)

Later, we will consider Kantian transcendental humanism and some of its diverse modern variants in some detail (see [Chapters 3 and 4](#)). For

the moment, it is sufficient to note that my generic characterization of humanism can apply to very different conceptions of the human–nonhuman divide.

1.2 Transhumanist ethics

Most philosophical humanists hold some conception of what gives human life a distinctive value and dignity, whether or not they accord other forms of natural or supernatural life a similar status. Humanists have also developed precepts and methods for protecting and cultivating these valuable attributes. At the risk of oversimplification, the only reliable techniques for achieving these aims, to date, have been *politics* and *education*. For example, Aristotle claimed that moral virtues like courage or generosity are habits. Whether good or bad, habits do not develop naturally but have to be instilled through education and legislation, so that children and adult citizens learn to act and be affected in the right ways. The formal study of ethics is only intelligible against this politically constituted background (NE 1095b).

Republican humanists like Machiavelli, Rousseau and Charles Taylor follow Aristotle in seeing the political as the setting in which humans become fully human (Berlin 2000: 47; Taylor 1985). Kant likewise argued that humans needed to be disciplined and educated to become fully autonomous beings “who can and do act from duty” (Moran 2009: 477). His prescriptions include an assortment of child-rearing tips (e.g. Locke’s suggestion that children’s shoes should be designed to let in water to prevent them becoming too attached to comfort) but also nostrums for cultivating moral understanding (*ibid.*: 477–8).

Transhumanists also sign up to this ethical view of humans as uniquely autonomous or self-fashioning animals. Like their humanist forebears, transhumanists think that human-distinctive capacities like rationality, compassion and aesthetic appreciation are intrinsically valuable and should be cultivated and protected (Bostrom 2008). However, they believe that the traditional methods that humanists have used to foster them have been limited until recently by the material constraints of human biology and of nature more generally (Sorgner 2013; Habermas 2005: 28).

Transhumanists hope to add the fruits of advanced technologies to the limited toolkit of traditional humanism, believing that prospective developments in the so-called “NBIC” suite of technologies will soon allow humans unprecedented control over their own nature and morphology. NBIC stands for “Nanotechnology, Biotechnology, Information Technology, and Cognitive Science”. Nanotechnology consists of techniques of very fast and precise atom-scale manufacturing. Biotechnology

consists of tools for manipulating life and living systems at the genetic/sub-cellular level. Information Technology involves computing and cybernetic technologies such as Artificial Intelligence (AI) and Brain–Machine Interfaces (BMI). Finally, “Cognitive Science” is an umbrella term for disciplines such as neuroscience, artificial intelligence and philosophy of mind that are gradually revealing the workings of human and nonhuman minds (§§1.3, 2.1).

The 1998 Transhumanist Declaration – signed by many important and active members of the world transhumanist movement including Anders Sandberg, Nick Bostrom, David Pearce, Max More and Natasha Vita-More – is particularly explicit on both these points. Articles one and two state:

- (1) Humanity will be radically changed by technology in the future. We foresee the feasibility of redesigning the human condition, including such parameters as the inevitability of aging, limitations on human and artificial intellects, unchosen psychology, suffering, and our confinement to the planet earth.
- (2) Systematic research should be put into understanding these coming developments and their long-term consequences.

(World Transhumanist Association 1998)

Self-fashioning through culture and education is to be supplemented by technology. For this reason, transhumanists believe that we should add *morphological freedom* – the freedom of physical and mental form – to the traditional liberal rights of freedom of movement and freedom of expression (Bostrom 2005a, 2005b; Sorgner 2009). We should be free to discover new forms of embodiment in order to improve on the results of traditional humanism.

- (4) Transhumanists advocate the moral right for those who so wish to use technology to extend their mental and physical (including reproductive) capacities and to improve their control over their own lives. We seek personal growth beyond our current biological limitations.

(*Ibid.*)

According to many transhumanists, the single most important application of NBIC technology will be to amplify and enhance human cognitive powers. As we become smarter, we become better at realizing personal and social goals. Some of these goals may be morally admirable: for example, eliminating starvation or scarcity with new agricultural and manufacturing techniques, finding cures for diseases or becoming better at deliberating about social policy (Sandberg & Bostrom 2006: 201).

The exercise of rationality requires many cognitive aptitudes: perception, working and long-term memory, general intelligence and the capacity to acquire cultural tools such as languages and reasoning methods. There appear to have been significant increases in the level of general intelligence in industrialized countries during the twentieth century – particularly at the lower end of the scale. These may be explained by modern social initiatives such as the removal of organic lead from paints and petrol, improved nutrition and free public education (Sandberg & Bostrom 2006: 210).

However, there appears to be a limit to the effect of environmental factors upon cognition because the efficiency of our brains is constrained by the speed, interconnectedness, noisiness and density of the neurons packed into our skulls. The best scientists, philosophers or artists currently alive are no more intelligent or creative than Aristotle, Descartes, Leibniz or Newton.

For transhumanists like Bostrom and Kurzweil, really significant improvements of intelligence will require technologies that somehow augment or amplify the powers of our bare brains. Some of these may involve cognition-enhancing genetic interventions or drugs. Ingmar Persson and Julian Savulescu cite the creation of “Doogie” mice, genetically modified to increase production of the neuro-receptor NR2B. Doogie mice “demonstrated improved memory performance, both in terms of acquisition and retention” (Persson & Savulescu 2008).¹ There is also some evidence that the use of pulsed magnetic fields to stimulate neural activity (Transcranial Magnetic Stimulation) can enhance initial encoding of memories or their consolidation in long-term memory (Kirov *et al.* 2009).

Other intelligence amplification technologies may require humans to patch neural wetware into computational hardware. Many early twenty-first-century humans offload tedious tasks like memorizing phone numbers, or searching for the local 24-hour dry cleaner, to portable computing devices. Most transhumanists claim that the process of outsourcing biologically based cognition onto non-biological platforms is liable to accelerate as our artificially intelligent devices get more intelligent and as we devise better ways of patching computing hardware into our neuro-computational wetware.² Brain–Computer Interfaces like the BrainGate BCI show that it is possible to directly interface computer-operated systems with neural tissue, allowing tetraplegic patients to control devices such as robotic arms with their thoughts (Hochberg *et al.* 2006). Work is also in hand on Brain–Machine–Brain Interfaces (BMBIs) that provide prosthetic communication links to replace damaged connections between brain areas. For example, Guggenmos *et al.* (2013) showed that using a BMBI to replace neural links between the front and back motor

and sensory regions of a rat's brain could dramatically restore food grasping ability lost due to the lesion.

These developments support the principle that biological components that underpin human mental life can be replaced by functionally equivalent devices or by systems that are faster than biological computers by several orders of magnitude. For example, Kurzweil thinks that nanodevices might one day be used to non-invasively stimulate or probe the brain's native neural networks, extending our slow organic minds into more efficient and architecturally varied cognitive systems (Kurzweil 2005: 317).³

As neuroprostheses develop over the course of this century, it is conceivable that future humans or transhumans will be increasingly indistinguishable from their technology. Humans will become "cyborgs" or cybernetic organisms like the Borg in the TV series *Star Trek* with many of the functions associated with thinking, perception and even consciousness offloaded onto increasingly fast and subtle computing devices. As *Trek* fans will be aware, the Borg are not an attractive ideal for the humanist who values individual autonomy and reason. They are technological swarm intelligence – like an ant or termite colony – whose individual members are enslaved to the emergent goals of a super-organism (see §2.1, note 2).

However, many argue that those who see cyborgs as colonized and invaded flesh fail to understand that humans have always extended themselves through devices. The philosopher Andy Clark has argued that the integration of technology into biology has defined humans since the development of flint tools. We are, he claims, "Natural Born Cyborgs" whose mental life has always extruded into culturally constructed niches such as languages and archives (Clark 2003; Haraway 1991; see §2.2).

Perhaps, then, the transhuman future that I am sketching here will still be inhabited by beings whose aspirations, values and achievements would be recognizable to ancient and modern humanists. These transhuman descendants might still value autonomy, sociability and artistic expression. They will just be *much better* at being rational, sensitive and expressive – better at being human. Perhaps, also, these skills will repose in bodies that are technologically modified by advanced biotechnologies to be healthier and more resistant to ageing or damage than ours. But the capacities that define that humanist tradition here are not obviously dependent on a particular kind of physical form.

Transhumanists are also interested in the prospect of what computer scientist Ben Goertzel has dubbed Artificial General Intelligence (AGI) for the same reasons that they are concerned with cognitive enhancement more generally. An AGI would be a robot or computer system whose reasoning approximates or exceeds the range and flexibility of human reasoning.

There is plenty of bare bones, “narrow” AI (without the G) around but it consists of software that has been designed for fast and efficient operation in particular task domains (Goertzel 2006). Any system counts as intelligent if it is “optimizing” – able to find good solutions to problems in variably complex environments (p. 1). For example, finding the nearest potential food source or avoiding predators. On this measure, a good internet search engine or the routing software that telecommunication networks use to find the quickest path through a network are intelligent. But their capacities are *domain specific* – unlike a human, they cannot turn themselves to other tasks, such as finding a table in a crowded restaurant, understanding a text message from a friend or considering alternative careers (Ekbj 2008).

A real AGI – like the fictive Commander Data from *Star Trek: The Next Generation* – would be able to apply its intellect flexibly to a vast range of problems, just as humans do.

But fictive representations of AGIs such as Data may reflect our cosy anthropocentric assumptions about what an artificial intelligence could be like. Shane Legg and Marcus Hutter have argued that the abstract definition of intelligence provided here – the ability to optimize in a range of complex environments – implies a mathematical ordering of possible intelligences. Current biological humans exist somewhere on this scale since our ability to realize our goals in complex environments is significant but bounded (Legg & Hutter 2007: 405). But there are conceivable occupants of this space whose cognitive flexibility exceeds the current model of human.

The prospect of AGI is regarded by many transhumanists as having “ambivalent potential” for both good and evil (Bostrom & Cirkovic 2011: 17). Increasing the quantity of intelligence on the planet might allow us to solve many social and technological problems that currently seem intractable. Yet writers like Bostrom are alive to the problems that attend the creation of genuine super-intelligence. For example, the advent of artificial super-intelligence might render the intellectual efforts of biological thinkers irrelevant in the face of dizzying acceleration in machinic intelligence. As the computer scientist and cryptographer Irving Good wrote:

Since the design of machines is one of these intellectual activities, an ultra-intelligent machine could design even better machines; there would then unquestionably be an “intelligence explosion,” and the intelligence of man would be left far behind. Thus the first ultraintelligent machine is the last invention that man need ever make, provided that the machine is docile enough to tell us how to keep it under control.

(Good 1965: 33–4)

This caveat is significant. The best-case scenario here might be one in which humans are made redundant by machinic creations that outpace them with accelerating rapidity (see §1.4).

Cognitive enhancement and developments elsewhere in the NBIC suite might, then, help us to cultivate traditional humanist values such as autonomy and the capacity for individual self-fashioning. However, our brief discussion of AGI prospects suggests one way in which cognitive enhancement could also frustrate these humanist goals.

Persson and Savulescu suggest that other developments in NBIC technologies could also significantly threaten human existence on this planet – for example, making it easier for garage fanatics and psychopaths to weaponize diseases or release deadly nanomachines into the environment. They claim that traditional tools for moral development like anti-racism education have failed to rid us of evolved dispositions – such as an inability to empathize outside immediate peer groups – that are ill-suited to this technologically volatile world (Persson & Savulescu 2008: 166–8). Thus, they argue, using drugs or genetic enhancement to make people more altruistic, cooperative and conscientious could be justified if the net effect is to mitigate these risks (p. 172).

The use of moral enhancement to achieve broad social goals is an ethically fraught area. It implies, at the very least, a repudiation of the Kantian assumption that personal autonomy is a paramount good. Its usefulness is also predicated on disputable assumptions about the evolutionary basis of morality that we lack the space to consider here. However, Persson and Savulescu's proposal illustrates why transhumanists hope to use NBIC technologies to debug ruinous moral dispositions that politics and education have failed to control.

1.3 Soul engines: transhumanism and metaphysics

Just *how* unrestricted and capable transhuman minds and bodies can become is contested since the scope for enhancement depends equally upon hypothetical technologies and upon some hotly contested claims in metaphysics and cognitive science.

For example, many transhumanists hope that developments in the NBIC areas will make it possible to scan the patterns of neural connectivity that allow human brains to generate human minds and selves and replicate these onto fast and powerful computer systems, just as one currently uploads the contents of a Word file onto an email attachment. Uploaded humans would, so the story goes, have the same experiences, beliefs and desires as biologically embodied ones, but they would be running on potentially immortal soul engines rather than messy and all-too-temporary associations of biological cells (Hauskeller 2012). Mind uploading could

allow humans to escape death altogether as long they took care to leave enough “backup copies” around (Sandberg & Armstrong 2012; see §3.2).

We do not know whether mind uploading is possible. Its possibility depends on a family of metaphysical positions that hold that minds, mental states (e.g. beliefs and experiences) and mental capacities (such as rationality and intelligence) are substrate-independent. Mind and intelligence would be substrate-independent if they could be exhibited by arrangements of matter very different from human bodies. In particular, it would have to be possible for artificial systems, such as computers, to have mental states and experiences; not merely biological, non-manufactured systems like humans and nonhuman animals.

The best known and most influential of these metaphysical theories, by far, is functionalism. The intuition that underlies functionalism is that mental states are defined by what they do – their roles – rather than by their intrinsic properties. For example, pain could be functionally characterized as a state that is caused by bodily damage and which produces aversive responses to the causes of that damage. Here damage is the input to the functional state while the aversive responses are its outputs. Functional states, then, are defined relationally in terms of their inputs and outputs. Inputs can be environmental stimuli or other mental states. Likewise, outputs can be other mental states or their behavioural effects (avoiding the source of a pain, for example).

If mental states are defined by causal roles (input–output relations) alone, any mental state could be *multiply realized* on any substrate in which there are fillers for those roles: for example, non-biological as well as biological ones. By analogy, many different kinds of system could count as being in the functional state *White Wash* if inputting dirty whites at some earlier time resulted in it outputting clean whites at some later time.⁴

So if functionalism is true, a mental state like experiencing the taste of ice cream could be experienced by you, but also by a functional copy of you that replicated your neural organization to a sufficiently fine grain (see Chalmers 1995). Given multiple realization, not just humans or cats or octopuses, but Martians, interstellar dust clouds, ghosts or robots could be candidates for mindedness given the right kind of functional organization.

As Gualtiero Piccinini observes, there is more than one way of expressing the functionalist thesis. I have introduced it as a claim about what it is for a system to realize a particular mental state such as a belief or a desire. However, at its most abstract, it is the claim that “the mind is the ‘functional organization’ of the brain, or any other system that is functionally equivalent to the brain” (2010: 270). The more general formulation is key for transhumanist aspirations for uploaded immortality because it is conceivable that the functional structure by virtue of which brains exhibit mentality is at a much lower level than that of individual

mental states: for example, at the level of individual neurons and the various chemical messaging systems that modulate their firing behaviour (Philippou 2013).

Thus given a sufficiently global functionalism, a computer simulation of an embodied nervous system that had fillers for every functional role in an individual human mind would also be an emulation *of that mind* lacking none of the preconditions for intentionality (representation) or conscious experience (Bostrom & Sandberg 2008).⁵

This would obviously support the metaphysical possibility of “mind uploading” since it would allow that minds could run on vastly durable and flexible soul-engines and not fragile biological systems. Advances in computation and neuroscience like Kurzweil’s speculative neuroprostheses could result in human minds migrating onto non-biological platforms inconceivably faster and far more robust than evolved biological bodies (Kurzweil 2005: 198–202).

As I noted earlier, functionalist claims for the substrate independence of mind and mental attributes have been contested. Ned Block famously argued that a sufficiently abstract version of functionalism entails that a human population – the population of China, say – could be organized so as to realize a human mind for an hour if a sufficient number agreed to be connected by radio so that they could pass signals to one another in a way that realizes precisely the input–output behaviour of neurons in a human brain (Block 1978).

Such a being would implement the functional diagram of a human – albeit on a much slower time scale – but it seems *prima facie* objectionable (to some) to claim that this corporate entity would have a mind. Some functionalists bite this particular bullet by arguing that humans, like nations, are corporate entities made of neurons and other functional components (Clark 1994). Others may hope to qualify functionalism in a way that precludes China Brains and their ilk.

Block’s objection is salutary because it suggests that there is a genuine metaphysical issue concerning the *degree* of substrate independence exhibited by mental properties. It might, after all, be possible for minds to run on platforms that are very different to human bodies; but they might differ in important ways to human minds (§§1.4, 3.1, 3.2). This possibility raises very different issues for transhumanists – who genuinely hope to realize human-type minds differently – and speculative posthumanists, who advocate the possibility of technologically engendered nonhumans.

1.4 Posthumanism

Like humanism, posthumanism – or the philosophical critique of anthropocentrism – comes in different flavours. All are opposed to some

form of human-centred worldview. However, they apply to different domains and often use antithetic methods of argument and analysis:

- Speculative posthumanism (SP) – the primary concern of this book – opposes human-centric thinking about the long-run implications of modern technology.
- Critical posthumanism is a broadly based attack on the supposed anthropocentrism of modern philosophy and intellectual life (§1.1).
- Speculative realism opposes the philosophical privileging of the human–world relationship in Kantian and post-Kantian transcendental philosophy.
- Philosophical naturalism is also opposed to the claim that philosophical truth claims can be arbitrated from a transcendental point of view but uses scientific theory as a constraint on philosophical truth claims. By contrast, while speculative realists are equally hostile to transcendentalism, many also oppose naturalism on the grounds that science is just another way of translating a mind-independent reality into forms that humans can understand.

Despite the doctrinal and stylistic differences between these posthumanisms, their concerns are overlapping. SP proposes that there could be technologically engendered nonhumans who may experience and understand the world very differently to humans. Thus, like speculative realism, it cannot view reality as a human mental or social construction and, like critical posthumanism, it is sensitive to any privileging of human standpoints. I will also argue that philosophical naturalism provides a powerful weapon against transcendental humanism (see [Chapters 3](#) and [4](#)). It is arguable, though, that SP need not be committed to philosophical naturalism.

Let us sample each posthumanism in turn.

Speculative posthumanism

The radical augmentation scenarios discussed in the previous two sections indicate to some that a future convergence of NBIC technologies could lead to a new “posthuman” form of existence: the emergence of intelligent and very powerful nonhumans. In particular, we noted that the development of artificial general intelligence might lead, in Good’s words, to an “intelligence explosion” that would leave humans cognitively redundant, or worse. Following an influential paper by the computer scientist Virnor Vinge, this hypothetical event is often referred to as “the technological singularity” (Vinge 1993).

Like Good, Vinge claims that were a superintelligence created, it could produce still more intelligent entities, resulting in a growth in mentation

to intellectual plateaus far above our current capacities. The precise form of this technology is unimportant for Vinge's argument. It could be a powerful cognitive enhancement technique, a revolution in machine intelligence or synthetic life, or some as yet unenvisaged process. As David Chalmers points out, the technology needs to be "extendible" in as much that improving it yields correlative increases in the intelligence produced. Our only current means of producing human-equivalent intelligence is non-extendible: "If we have better sex, it does not follow that our babies will be geniuses" (Chalmers 2010: 18).

This recursively improvable technology for intelligence amplification would, according to Vinge, constitute a point beyond which biological constraints on human and nonhuman life on this planet would cease to apply. The "posthuman" minds it would produce would be so vast that we have no models for their transformative potential. They would consequently occupy a distant region within Legg and Hutter's ordering of intelligences (see §1.3). The best we can do to grasp the significance of the technological singularity, he claims, is to draw analogies with an earlier revolution in intelligence:

And what happens a month or two (or a day or two) after that? I have only analogies to point to: The rise of humankind. We will be in the Post-Human era. And for all my rampant technological optimism, sometimes I think I'd be more comfortable if I were regarding these transcendental events from one thousand years remove ... instead of twenty.

(Vinge 1993: np)

Current humans, it seems, may be no more capable of understanding a post-singularity dispensation than a rat or nonhuman primate can understand public transportation or distributive justice.⁶

The claim that a singularity is possible nicely exemplifies the philosophical position of speculative posthumanists – though, as I will argue in later chapters, *it does not exhaust it* (Chapter 5). Posthumans in this sense are hypothetical wide "descendants" of current humans that are *no longer human* in consequence of some history of technological alteration.

I've coined the term "wide descent" because exclusive consideration of biological descendants of humanity as candidates for posthumanity would be excessively restrictive. Future extensions of NBIC technologies may involve discrete biotechnical modifications of the reproductive process such as human cloning, the introduction of transgenic or artificial genetic material or seemingly exotic processes like mind uploading. Thus entities warranting our concern with the posthuman could emerge via modified biological descent, recursive extension of AI technologies (involving human and/or nonhuman designers), quasi-biological descent from

synthetic organisms, a convergence of the above, or via some technogenetic process yet to be envisaged!⁷

As I will emphasize in my discussion of critical posthumanism, it is vital to appreciate that the metaphysics of SP is independent of the ethics of transhumanism. One can espouse transhumanist ethics for which enhancing human capacities is a moral priority or a political right, while discounting claims that wide descendants of current humans could become posthuman. Similarly, speculative posthumanism is consistent with the rejection of the ethics of transhumanism or any technological itinerary with posthuman potential. One can hold that a posthuman divergence from humanity is a significant metaphysical possibility but far from a desirable one (Roden 2012a; [Chapter 5](#)). This is not to say, of course, that SP lacks ethical and political implications of its own but these will only become apparent once we appreciate the conceptual scope of a posthuman divergence.

Critical posthumanism

Critical posthumanists argue that Western Humanism is based on a dualist conception of a rational, self-governing subject whose nature is transparent to itself and, as Veronika Hollinger puts it, “unmarked by its interactions with the object-world” (Hollinger 2009: 273). It is unsurprising, then, that many take René Descartes to be the arch-humanist since he makes an uncompromisingly sharp distinction between the human capacity for transparent self-knowledge and an altogether shakier access to a physical nature “outside” the self.

Descartes’ claim for epistemic self-transparency is supported by the famous “evil demon” thought experiment applied at the end of the first of his *Meditations* to filter out beliefs that are not resistant to maximal doubt. The demon (*malin génie*) is a being every bit as powerful as God (God’s Evil Twin, so to speak) who is supposed to have simulated the whole of material reality in our minds:

I will suppose, then, not that Deity, who is sovereignly good and the fountain of truth, but that some malignant demon, who is at once exceedingly potent and deceitful has employed all his artifice to deceive me; I will suppose that the sky, the air, the earth, colours, figures, sounds and all external things, are nothing better than the illusions of dreams, by means of which this being has laid snares for my credulity; I will consider myself as without hands, eyes, flesh, blood, or any of the senses, and as falsely believing that I am possessed of these.

(Descartes 1986: 84)

In order for this deception to occur, the mind’s contents must be *world-independent*. Suppose it is only possible for me to have beliefs about

material objects if material objects exist. Then it would not be possible for me to be radically mistaken about their existence if the material world is a simulation. Descartes' epistemology thus presupposes a doctrine now known as "internalism". Internalists claim that the meanings of our thoughts and intentions are fixed independently of the possible realities to which they refer by the autonomous powers of the thinking subject.⁸ Descartes also requires that these contents are transparent or directly evident to the subject. This allows existence and content of mental states to be inspected directly even in cases where the objects to which they refer do not exist. Thus the interior realm of the mind affords a bulwark against the skeptical doubts raised by the evil demon thought experiment.

This idea of human subjectivity as a self-determining "interior realm that can resist skeptical doubt" is successively criticized and reformulated by later philosophers in the idealist and empiricist traditions such as Kant (Farrell 1996: 11; see §3.3). It also motivates Descartes' famous and widely contested metaphysics of substance dualism, for which minds and material bodies are distinct entities with utterly different attributes.

According to Hayles and Badmington, the term "posthuman" is appropriately applied to a late stage of modernity which the legitimating role of the self-authenticating, self-governing human subject handed down from Descartes to his philosophical successors has eroded. This erosion is, in part, technoscientific in origin. Descartes' dualisms between inner and outer, mind and mechanism have become harder to maintain since the computational revolution showed that rational operations can be implemented by appropriately structured mechanical processes, a point lucidly conveyed by Donna Haraway in her "Manifesto for Cyborgs":

Late twentieth-century machines have made thoroughly ambiguous the difference between natural and artificial, mind and body, self-developing and externally designed, and many other distinctions that used to apply to organisms and machines. Our machines are disturbingly lively, and we ourselves frighteningly inert.

(Haraway 1991: 152)

Critical posthumanism is a response to this displacement of human–nonhuman dualisms within the most advanced academic humanities – a complex re-conception of a human subject *presumed* autonomous and self-present "with a view to the deconstruction of anthropocentric thought" (Badmington 2003: 15). This "deconstruction" consists of a demonstration of the myriad ways in which texts that depict or imagine human transcendence and separateness from a machinic or material nature fail to insulate the human from these – often threatening – inhuman "others".

For Hayles, there is nothing less “posthuman” than futurist scenarios about uploaded immortality or cybernetically extended consciousness detailed above. Rather than questioning anthropocentrism, these recapitulate it as a kind of space operatic saga in which humanity gets to draw its face in the stars. She thinks this “hyper-humanism” is best exemplified in the proposal that minds could transcend bodies by uploading to soul-engines:

I was reading Hans Moravec’s *Mind Children: The Future of Robot and Human Intelligence*, enjoying the ingenious variety of his robots, when I happened upon the passage where he argues it will soon be possible to download human consciousness into a computer. To illustrate, he invents a fantasy scenario in which a robot surgeon purees the human brain in a kind of cranial liposuction, reading the information in each molecular layer as it is stripped away and transferring the information into a computer. At the end of the operation, the cranial cavity is empty, and the patient, now inhabiting the metallic body of the computer, awakens to find his consciousness exactly the same as it was before.

How, I asked myself, was it possible for someone of Moravec’s obvious intelligence to believe that mind could be separated from body? Even assuming such a separation was possible, how could anyone think that consciousness in an entirely different medium would remain unchanged, as if it had no connection with embodiment? Shocked into awareness, I began to notice he was far from alone.

(Hayles 1999: 1)

Likewise, Elaine Graham also assumes that a posthuman successor species should be conceived as the apotheosis of the rational self, free to subjugate a bodily nature conceived as abject and threatening (Graham 2002: 9; Braidotti 2013: 2).

Hayles, Graham and Badmington may be right to slam transhumanists for being insufficiently vigilant about conceptions of agency and subjectivity but accusations of philosophical naivety can cut many ways. Their analysis confuses *metaphysical* claims about nonhuman succession and *ethical* aspirations to transcend our death-prone biology. As our brief foray into the metaphysics of mind uploading shows – and Hayles seems to recognize here – non-biologically instanced minds would *only* resemble ours if a very liberal substrate neutrality applies. Thus, while castigating transhumanism for its penchant for anthropocentrism, they overlook the possibility that posthuman succession might result in *posthumans* rather than another iteration of *us*: “Humanity 2.0”. We will consider (critical) posthumanist objections to (speculative) posthumanism in greater detail in the next chapter.

As my allusions to “deconstruction” imply, the critical posthumanist project is heavily influenced by the work of deconstruction’s primary philosophical exponent, Jacques Derrida. Hayles goes so far as to claim that “deconstruction is the child of the information age”, crediting Derrida with the insight that speech is a cyborg act, never simply present or absent but dependent on operations and contexts that exceed the consciousness or understanding of the speaking subject (Hayles 1999: 44).

It is worth emphasizing that Hayles is using “deconstruction” to refer to a set of philosophical claims about subjectivity, language and textuality that Derrida reiterates throughout his very large corpus. Rather like the proponents of cognitive science and artificial intelligence, Derrida argues that the organizing activity some philosophers attribute to a subject or to language depends on opaque and very rudimentary operations that can be thought of as a kind of “generalized writing” – a metaphor drawing on writing’s ambiguous status as an external technical medium that emancipates meaning from its source in speakers, thinkers and originating contexts of utterance. This passage from an important early essay, “Freud and the Scene of Writing”, sums up Derrida’s attempt to complicate and diffuse the traditional view of the human subject as the monarch of its meanings:

The “subject” of writing does not exist if we mean by that some sovereign solitude of the author. The subject of writing is a system of relations between strata, the psyche, society, the world. Within that scene, on that stage, the punctual simplicity of the classical subject is not to be found.

(Derrida 1978: 226–7)

However, as well as being a philosophy, deconstruction is also a reading strategy for exhibiting discrepant and contradictory elements within a text. The major works in which Derrida articulates his account of generalized writing argue that philosophical texts which formulate an ideal of epistemic transparency are bound to compromise that ideal, thus implying its dependence on something foreign to presence; a “supplement” for a past present or a present to come: memory, representation and writing (Derrida 1998).

On the basis of these readings, Derrida argues that the rational subjectivity proclaimed by some humanists depends on a generative system woven of minimal units of textual difference and repetition (see §2.1 for further discussion of Derrida’s argumentation). Rodolphe Gasché likens this textual “infrastructure” of thought to the “tain of the mirror”: the dull laminate under a mirror that makes philosophical reflection possible while remaining invisible to the mirrored gaze (Gasché 1986).

In “Theorizing Posthumanism”, Badmington applies this strategy to a passage in the fifth part of Descartes’ *Discourse on Method* which seems an

exemplary act of the kind of “ontological hygiene” that the posthuman era is now overturning. Here the philosopher supports his substance dualism by arguing that no machine (no material body) could exhibit the fluid general intelligence of ordinary humans because this would entail a mechanism of infinite complexity. The human mind and its machines are consequently partitioned into absolutely distinct ontological domains.

Descartes allows that a complex automaton of the kind that would have been familiar to his seventeenth-century readers could imitate the motions and sounds of human language and particular human responses to sensory input, “for example, if touched in a particular place it may demand what we wish to say to it; if in another it may cry out that it is hurt, and such like” (Descartes 1986: 44). However, to ape rationality, a mechanical system would need to integrate special purpose mechanisms suited to every occasion (in computational terms, a “look up table” – see Wheeler 2005: 32–4). Since these occasions could vary infinitely yet still elicit a sensible response from a rational human adult, a mechanical system that could generate rational responses for all occasions would require an infinite number of parts. Since reason is a “universal instrument that is alike available on every occasion” and infinite complexity is impossible, the rational mind must be a non-spatial, immaterial substance distinct from the body (Descartes 1986: 45).

Badmington argues that this separation of mind and machine is less hygienic than it might appear, for it implies that a material system with the complexity to generate flexible performances would be functionally rational. “Reason,” Badmington writes, no longer capable of “distinguish[ing] us from the beasts, would meet its match, its fatal and flawless double” (Badmington 2003: 18). He then springs his *coup de théâtre*:

On closer inspection, in other words, there lies within Descartes’ ontological hygiene a real sense in which, to take a line from one of Philip K. Dick’s novels, “[l]iving and unliving things are exchanging properties”. Quite against his will, quite against all odds, Descartes has begun to resemble Deckard, the troubled protagonist of *Do Androids Dream of Electric Sheep?* and *Blade Runner* (dir. Ridley Scott, 1982), who utterly fails to police the boundary between the real and the fake.

(Badmington 2003: 12)

So if humanity is a functional category – not one that applies in virtue of some intrinsic difference like the presence or absence of an immortal soul – the difference between the android that simulates humanity and the human, in itself, is no difference at all. This strange reciprocation comes to a head in the culmination of the TV series *Battlestar Galactica*.

Here a fugitive group of humans and the humanoid versions of the Cylons – androids that, like the replicants in *Blade Runner*, were created by humans but rebelled and eventually destroyed the human home worlds in a nuclear attack – form a commonwealth of human and machine in which the former antagonists co-operate to achieve common political aims, fall in love and raise hybrid Cylon–Human children.

Significantly, this social union becomes possible only after a group of Cylons elect to destroy the mind-uploading technology that formerly made them immortal (see §1.3). Prior to this, Cylons were functionally immortal revenants, able to upload their mind to a cloned body after death. This technological capacity made them too different to be accommodated within the humans' recognizably liberal, North American-style republic. The destruction of their posthuman infrastructure ironically lays the foundation for a shared state in which both groups have equal interests (see Roden 2008).

Yet, the slippage from human–posthuman difference to a cyborg–social union implies, once more, that humans and machines are functionally differentiated by the historical and technological relationships in which they enter, *not* by having a biological as opposed to a machinic lineage (see Chapter 5). *Both* are, in Haraway's terms, "cyborgs" – ambiguous assemblages of the natural and the artificial that destabilize oppositions between entrenched political identities (Haraway 1991).

This spirit of ethical and political complication is a goal of Haraway's posthumanist ontology as it is of more recent posthumanist theorists like Rosi Braidotti (see Chapter 8). As Haraway puts it:

The cyborg would not recognise the Garden of Eden, it is not made of mud and cannot dream of returning to dust. Perhaps that is why I want to see if cyborgs can subvert the apocalypse of returning to nuclear dust in the manic compulsion to name the enemy.

(Haraway 1991: 151)

Cyborgs do not mourn lost origins or halcyon pasts; cyborg politics likewise disclaims universal history, eschewing dreams of reconciliation in favour of experimental alliances like the human–machine couplings of *Galactica*. Braidotti claims that the levelling of the difference between minds, machines and living organisms which opens up the space for this experimentation with subjectivity is also expressed in a global bio-politics in which living beings are meshed into restrictive systems of surveillance and exploitation (Braidotti 2013; see §8.2). Along with Claire Colebrook, she also claims that a liberal politics oriented towards the rights and welfare of humans is incapable of addressing issues such as climate change or ecological depletion in the so-called "anthropocene" epoch, in which

humans “have become a geological force capable of affecting all life on this planet” (Braidotti 2013: 66; Colebrook 2012b: 188).⁹

In the later parts of this book, I will suggest ways in which this ethico-political conception of the posthuman can illuminate some of the deep ethical problems raised by SP. However, this will require that we pass through a more sustained analysis of posthuman possibility than is afforded in the majority of critical posthumanist writings.

Badmington’s deconstructive reading of Descartes exemplifies some of the philosophical limitations of critical posthumanism. In part, they derive from a textualist obsession with nuances of conceptual expression rather than with the articulation of concepts or the things that concepts are about. For example, Badmington fails to note that Descartes’ argument against machine intelligence in *The Discourse* is not an argument for human–machine difference but an argument *from* human–machine difference *to* substance dualism. The purported difference between human and machine is not the conclusion of the argument but its premise. It presupposes that there are manifest *functional differences* between humans and machines, humans and brutes. The hygienic cordon between the human and its other is not in doubt: the point, for Descartes, is to explain it.

This lack of theoretical rigour seeps into critical posthumanist analyses of humanism. Most fail to figure the difference between anthropocentrism and humanism noted above. Moreover, few are attentive to the varieties of humanism and anthropocentrism. For example, Cary Wolfe begins his book *What is Posthumanism?* by citing a Wikipedia entry on “humanism” that identifies it with the cosmopolitan ideal of the dignity and moral autonomy of human persons that we identified with one kind of humanism in §1.1 (Wolfe 2010: xi). On the next page he cites the resonant close of *The Order of Things* where Foucault famously declares “man is an invention of recent date. And one perhaps nearing its end”, comparing its erasure with that of a human profile “drawn in sand at the edge of the sea” (Foucault 1970: 387).

Wolfe suggests that the roots of contemporary posthumanism in the academic humanities can be traced back to Foucault’s anatomization of the human. However, like Hollinger and Hayles, he identifies his posthumanism with the embrace of materiality (opposing it to transhumanism which, like Hayles and Badmington, he regards as the “intensification of humanism” by technological means – Wolfe 2010: xv).

This genealogy may be accurate, for all I know. If so, it is the history of some confusion. As Béatrice Han-Pile emphasizes, Foucault’s “humanism” is not the ethical humanism associated with cosmopolitanism or with Renaissance ideals of individual self-fashioning (Han-Pile 2010). To which we should add that it is not the humanism associated with the

separation of mind, body and animality (see [Chapter 2](#)). It is, rather, due to Kant's turn *away* from Cartesian epistemology (in which a self-transparent subject represents a mind-independent nature) towards the transcendental subjectivity that actively organizes nature (§§1.1, 3.3). To be sure, Kant supports cosmopolitanism from within his transcendental philosophy. But as humanists as diverse as Mill, Chomsky, Strawson, Rawls and Taylor show, there are many different ways of supporting the claim that most humans have distinctive moral powers. Not all forms of cosmopolitanism presuppose the transcendental humanism that Foucault has in his sights.

In a further conflation of disparate humans and humanisms, Wolfe claims that Daniel Dennett, an inveterate opponent of dualism, succumbs to Cartesianism when claiming that humans have a unique, cultural capacity to represent representation – to believe they believe, etc. (Wolfe 2010: 38). But, if anything, Dennett is expressing a Kantian understanding of the link between the capacity to acquire culture and sapience – the awareness of being a thinker answerable to reasons. As Lee Braver and others have noted, Kant's transcendental philosophy identifies this capacity to think that one is thinking in functional terms, not in terms of the intrinsic attributes of the thinker – which, for Kant, are unknowable in any case (Braver 2007: 54–5; §3.3).¹⁰

As we will see in [Chapter 3](#), transcendental forms of humanism are very much alive in phenomenological and pragmatist theories of the human subject. All of these reject both substance dualism and Descartes' claim that human mental life is self-transparent.

This functional characterization of a rational subject also involves a kind of dualism; not *substance* dualism but a dualism of languages or descriptions. A “dualist” of this stamp accepts that there are only physical things and events and that all token (individual) mental events are identical to physical events. However, she denies that rational or normative relations between mental events can be described physically (Davidson 2001a: 207–25). Astonishingly, the explanations of bodily processes such as the biochemistry of nerve cells contribute nothing to psychology in this account. At best they support our materialistic worldview by showing us how token psychological facts are “realized” or “instanced” by physical states. But this contributes to metaphysics, not to psychology. According to this “explanatory dualism” – as Mike Wheeler refers to it – “flexible, intelligent action remains conceptually and theoretically independent of the scientific understanding of the agent's physical embodiment” (Wheeler 2005: 51).

To be fair, posthumanist and feminist thinkers such as Hayles, Braidotti and Elizabeth Wilson, as well as proponents of “embodied” approaches to cognition like Wheeler, argue for the incarnate, embodied character of subjectivity and presumably oppose explanatory dualism (see §2.1).¹¹ But

conflating dualisms only undermines the project of putting body and self back together.

Speculative realism

Speculative realists are impatient with textual deconstructions of subjectivity of the kind undertaken in the work of Badmington and Wolfe. They argue that to undo anthropocentrism and human exceptionalism we must shift philosophical concern away from subjectivity (or the deconstruction of the same) towards the cosmic throng of nonhuman things (“the great outdoors”). Most speculative realists repudiate transcendental humanism in some form – that is, Kantian and post-Kantian attempts to understand things in terms of their relationship to human subjectivity and conceptual thinking. In the most exemplary work of speculative realism to date, *After Finitude: An Essay on the Necessity of Contingency*, Quentin Meillassoux refers to any philosophy that holds that thought can only think the relation between thought and its object; never the object as an absolute without relation to cognition as “correlationist” (Meillassoux 2010). Harman, Grant and Meillassoux have argued, against the correlationist, that any reality worth the name must be thought of as absolute, independent of human subjectivity and thus as deeply nonhuman and “weird”. Harman sums up the program with brio:

Inspired ultimately by Immanuel Kant, correlationists are devoted to the human-world correlate as the sole topic of philosophy. This has become the unspoken central dogma of all continental and much analytic philosophy. Speculative realist thinkers oppose this credo (though not always for the same reasons) and defend a realist stance toward the world. But instead of endorsing a commonsensical, middle-aged realism of boring hands and billiard balls existing outside the mind, speculative realist philosophies are perplexed by the strangeness of the real: a strangeness undetectable by the instruments of common sense.

(Harman 2011: vii–viii)

Speculative realists compose a somewhat marginal, fissiparous cell among philosophers influenced by post-Kantian European thought, birthing passionate internet flame wars between the rationalist wings exemplified by Brassier and Meillassoux – who, like Descartes, boldly deduce a theory of the real from an account of the internal demands of thought – and a more swinging camp consisting of philosophers like Harman or Levi Bryant who insist on the priority of ontology to epistemology. As its name might suggest, *speculative posthumanism* seeks to inject some realist attitude into philosophical discussion of posthuman futures by

acknowledging and formalizing the independence of posthumans from our current conceptions of them.

Philosophical naturalism

Philosophical naturalism is perhaps the dominant current of post-war Anglo-American philosophy. Most philosophical naturalists – I suspect – would be indifferent to their inclusion among the ranks of posthumanists, but insofar as naturalists offer some of the most trenchant, well-argued challenges to humanist – particularly *transcendental* humanist – thinking, it is important to discuss them alongside their more self-conscious and excitable colleagues.

Naturalist philosophy looks to the truth-generating practices of science rather than to philosophical anthropology to warrant claims about the world's metaphysical structure. Naturalists think that human knowledge is the product of fallible primates whose biology does not equip them to reliably track the deep structure of the world. Philosophical naturalists regard earlier attempts, such as Kant's, to carve out foundational truth claims secure from revision by the findings of science, history and observation as conspicuous failures, for they misinterpret anthropological facts about how we are disposed to think as facts about how the world must be. As James Ladyman and Don Ross remark, "Naturalism is, among other things, the metaphysical hypothesis that the objective world is not constrained by any reasons or standards of reasonableness" (Ladyman & Ross 2007: 288).

Functionalism (§1.3) is an example of naturalism on-the-job in philosophy of mind because its analysis of mental state types as causal roles suggests one way in which mental phenomena can be understood within the ontological framework of contemporary natural science. I will argue in [Chapter 4](#) that a naturalistic account of subjectivity is an effective foil for transcendental philosophies that argue for anthropocentric limits on posthuman possibility.

We will look, then, to naturalism to legitimate a theory of the *posthuman weird*.

Looking forward

We have analysed some of the philosophical positions whose contrasts and affinities will resonate through this book: humanism, transhumanism and posthumanism. Although critical posthumanism is probably the most visible form of anti-anthropocentric thinking within the academic humanities, we have identified some lacunae in the analysis of humanism offered by its leading proponents – including its failure to distinguish the normative

claims of transhumanism from speculative metaphysical claims about nonhuman descendants of humans. In [Chapter 2](#) I will argue that the assumption, on the part of many critical posthumanists, that posthuman futurism is really just an exaggerated humanism is not just a conceptual oversight but a betrayal of the project of anti-anthropocentrism, since the prospect of genuine posthumans poses a far greater challenge to the prescriptions of humanist philosophy than deconstruction or allied assaults on the integrity of the human subject.

Notes

- 1 Though evidence for significant enhancement effects appears to be equivocal to date.
- 2 Current estimates of the brain's raw processing power run to about 100 teraflops (100 trillion floating point calculations per second). The world's fastest supercomputers currently exceed this this by a factor of ten. The fastest neurons in our heads have a maximum spike frequency of about 200 Hz. The fastest transistors in the world currently operate ten million times faster at about 2 GHz. Moreover, since the 1950s, the increase in the processing power of computer components – integrated circuits – has obeyed Moore's law: approximately doubling every two years. If this trend continues over the next couple of decades, then the artificial processing power on this planet is likely to significantly outpace biological systems.
- 3 For a rather less sanguine commentary on the state of the art in non-invasive scanning, see Jones (2009).
- 4 Some systems might *realize* this relationship in the way that a modern washing machine does – running automatically through a wash cycle. Other systems might be kiosks containing human laundry workers who accept the dirty linen at the input hole, rinse and apply detergent, then rinse again, before outputting the clean clothes at a second slot. Finally, in Harry Potter's universe, washing machines may use industrious pixies and dirt-effacing pixie dust to the same effect. The *implementation details* of the state *White Wash* are thus *multiply realizable* in different systems that variably *implement* the same abstract relation.
- 5 Some philosophers are happy to allow that different types of mental states (beliefs, desires and itches) are a matter of their functional role within an organism but reject functionalism with regard to their representational content (Fodor & Lepore 1992). Others are functionalists about content, but not about the properties that distinguish conscious states like having toothache or seeing pink. Putting some mechanism in the same functional state my gustatory cortex is in when I taste ice cream would not necessarily replicate an experience of taste in the mechanism. If this is correct, replicating or approximating human mental software on an artificial platform like a robot might result in a cognitively sophisticated “zombie” rather than a being with full dress phenomenology. However, if we accept the functionalist accounts of consciousness provided by philosophers like Daniel Dennett and Michael Tye, the prospects for artificial consciousness appear somewhat brighter (Dennett 1991; Tye 2002; Cohen & Dennett 2011).
- 6 One might be tempted to compare a post-singularity world to the Kantian thing-in-itself which, lacking a mode of presentation in the experiential world of space and time, must remain forever unknowable to us (see [Chapter 3](#)). In Roden (2010a, 2012b), however, I consider and reject the applicability of this conception of transcendence to the singularity or the posthuman more generally.
- 7 The wider significance of Wide Descent will become clearer when I provide a fuller exposition of SP in [Chapter 5](#) (§5.3).
- 8 Internalism is rejected by so-called “active” or “process” externalists who view mind as embodied activity and by semantic externalists, like Donald Davidson, who argue that the content of our thoughts is established by our interactions with our environments (§§2.1, 5.7).

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- 9 On the surface, this last claim appears difficult to justify. If current environmental problems are a consequence of human mismanagement, their solution will require changes in human institutions and practices.
- 10 While the existence of a rational, self-aware machine like a Cylon or a Replicant might challenge Cartesian dualism, it would not challenge the Kantian equation of rationality and sapience.
- 11 See in particular Wilson's excellent discussion of the way in which a Derridean conception of generalized writing can help us understand the phenomenon on "dermographism" (writing on the body) in Wilson (1999).