Disability and Prosthesis Beyond Utility and Function

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Introduction
Technologies are not mere external utilities. They are profoundly involved within human development. This involvement can by explained in various ways. And, since technologies have a historical development, they can acquire metaphysical baggage. One way to conceptualise technology is prosthesis: a tool—from a flint or a hammer, to language—that extends or enables capacities. I’ll discuss prosthesis as a human-technology relation, and consider three such conceptualisations—instrumentalism, Bernard Stiegler’s ‘originary technicity’, and Gilbert Simondon’s ‘concretisation’—and discuss their relevance to and potential for thinking about disability.

Early Theories of Technology
Early theories of technology take one of two forms: instrumentalism and substantivism. In the former—which is ubiquitous—technologies are tools; mere means awaiting use towards autonomously-formulated human

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ends.\textsuperscript{2} They are epistemically and ethically neutral, or “subservient to values established in other… spheres”.\textsuperscript{3} Instrumentalism is broadly optimistic: technologies are means towards freedom. Substantivism tends towards pessimism. Here, technology is no mere means, but an autonomous force that distorts or replaces other values, and determines behaviour.\textsuperscript{4} This follows from its underlying, instrumental logic. This engenders an objectivising disposition towards others and world—as mere manipulable resources—that alienates humans from their non-technological nature.

Differences notwithstanding, these share a cluster of related ontological presuppositions that flow from oppositions between natural and artificial, human and nonhuman.\textsuperscript{5} I'll concentrate on instrumentalism, and briefly mention three. The first is most fundamental: the \textit{principle of essentialism}. There exists some specification of what the human is, which properties it possesses. Second, the \textit{principle of autonomy}. This exclusively human property is fundamental to definition of the human, and requires—in principle, if not always in fact—no additional material for its exercise. Humans are autonomous subjects for whom technology is a mere objective means: these extend a freedom that passes through them while

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leaving no trace. Finally, the principle of externality. Technology is fully exterior to the human. It is a neutral means to solely human ends. I'll call this position—that betrays a clear humanist bent—‘weak prosthesis’: weak, because technology makes no profound contribution to, and has no enduring effect upon, human essence. It includes any technological intervention that purports to extend or restore human properties without changing the human itself.

Instrumentalism and Disability
I'll turn now to disability, and how this separation between human essence and technology plays out in the concept of normal function. Medical accounts often consider disability an individual problem occasioned by a dysfunctional bodily property. In Christopher Boorse’s ‘normal function’ concept, the "normal is the natural", while diseases are “foreign to the nature of the species”? Humans unable to perform his normal activities—speaking, walking—are dysfunctional. Impairment essentially and directly correlates with health reduction and warrants correction or rehabilitation. Some medical ethicists adopt this as a regulatory standard. Here biological deviation from normal function—taken as objective—correlates with decreased social opportunity as a ‘normal competitor’, or decreased

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6 Kroes and Verbeek interestingly note that positive metaphors about technology tend to ascribe goodness to the wisdom of its human users, while negative assessments indict technology precisely for having its own autonomy: while a human creation, it goes on to resist, override, or even determine, human will.


quality of life. Only those who see, walk, talk, access “the ‘normal opportunity range’”. Accordingly, medicine and technology help by restoring normal function.

I don’t mean that such intervention is always negative, or to discount positive reports by those using prosthetics or undergoing interventions that replicate functional and aesthetic norms. My concern is with technology and production of the human. I’m suggesting that weak prosthesis does more than it admits. The implied boundary between human and technology obscures their myriad interleavings. It stabilises across time the organising concept of human essence whose autonomy correlates with morphological properties. Its purported neutrality obfuscates this productive role. This occurs in different technological registers: from the operative idea of ‘restoration’ for those with congenital impairments, to instruments that monitor for foetal ‘abnormalities’, resulting in selective termination. I’m not debating the ethics of these practices. I’m suggesting that technological intervention reproduces and renegotiates a boundary within the living between normalcy and deviation, and that this boundary is not read off nature, but introduced into it.

Stiegler and Technics
Latterly, philosophers of technology have undertaken an ontological reorientation away from dualism, and understand humans as profoundly

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9 The From Chance to Choice authors claim to broadly accept the social model of disability as laid out in the UPIAS manifesto. However, their actual argumentation consistently connects diminished opportunity to biological deficit.

10 Ron Amundson, "Against Normal Function", Studies in History and Philosophy of Biological and Biomedical Sciences 31, no. 1 (2000): 33-53. See, for example, Buchanan et al. “Justice includes a commitment to equal opportunity, and genetically based disabilities, like other disabilities, impair opportunity”. From Chance to Choice 270.
interrelated with technologies. I’ll talk about Bernard Stiegler, then discuss some implications for disability and prosthesis.

I’ll call his position strong or ‘constitutive’ prosthesis, because it understands technology as internal to the definition of humanitas. The human is constituted as such through technological activity.\(^\text{11}\) Stiegler’s argument goes roughly as follows. The human is ‘born too early’: it has no inherent capacities, including memory. This susceptibility—human lack—is constitutive, originary. What the human has, essentially, is nothing: its essence is indetermination. It fabricates technology to mitigate this deficiency. Such supplements as language, sociality, tools, transform environs and, ultimately, defer death.\(^\text{12}\) The human exists as its concurrent externalisation in technical materials, and internalisation of this prosthetic ek-sistence: co-constitution of ‘inside’ and ‘outside’, not addition of external technology to preexisting interiority.\(^\text{13}\)

Finally, this ruptures from ‘pure’ biological life. Technology comprises a new “inorganic organisation of memory”: human culture embodied in

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\(^\text{11}\) Bernard Stiegler, *Technics and Time: The Fault of Epimetheus*, trans. Geoffrey Beardsworth (Stanford: Stanford University Press, 1998). Stiegler contests Heidegger’s assertions that the essence of technology is outside technics, and that there are other, more open modes of world revealing than that of technology. What Heidegger overlooks in his search for a more poetic mode of world disclosure is that humans simply are in virtue of their relation with technics. Technics comprises nothing less than the horizon of human existence: the genesis of technics corresponds precisely with the genesis of the human.

\(^\text{12}\) Stiegler’s position echoes that of Arnold Gehlen, for whom humans are Mängelwesen: fundamentally deficient, and thus in need of technologies to compensate for this, so to survive in an environment to which they are not naturally adapted. Gehlen, *Man, His Nature and Place in the World*, trans. Clare McMillan and Karl Pillemer (New York: Columbia University Press, 1988).

\(^\text{13}\) “[M]an invents himself in technics by inventing the tool—by ‘externalising’ himself techno-logically […] the interior is invented through this movement: it cannot precede it” Stiegler, *Technics and Time* 141-2. The evident fallacy of Rousseau and others is to posit a relation of succession between a pure and anterior human that only then externalises itself; a true origin that antedates its fall into contingency. In fact, the inside is produced precisely in the movement of exteriorisation.
enduring technical artefacts. Humans are definitively shifted from genetic into non-genetic memory, liberated from genetics, and subject to new, non-biological exigencies, which increases their indetermination.

This looks fruitful for disability and prosthesis. If the ‘human condition’ is technological compensation for inherent vulnerability, everyone is lacking, and none are complete. Moreover, technics is precisely liberation from biology. Consequently, disability need not identify a categorial division between completeness and insufficiency, between fully and partially human. Finally, technologies need not approximate normal function.

However, Stiegler shouldn’t be embraced too hastily. First, he separates biology and technology too forcefully, to under-acknowledge relations between body and technics. ‘Man’ still evolves biologically as an animal, but becomes human only through technical evolution: using tools to anticipate possibilities other than those proscribed by genetics. Human invention principally concerns a vie d’esprit that is not biological, but technically-instantiated. Even though this vie d’esprit exists in material technologies, this rehearses a merely technologised mind-body dualism. Externalisation in technics is simultaneously internalisation within the human, but only within technical subjectivity. This subjectivity is divided

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14. Creation issues from this historical lineage as sedimented within inorganic memory.
15. For Stiegler, instinct approaches genetic determination. The human possesses a kind of intelligence that offers a total freeing from such pre-determination. There are shades of capacity to choose: a vertebrate has greater latitude than an ant.
16. Defenders suggest that this is not so. Gerald Moore claims that Stiegler is suggesting that “humanity has no essential basis in biology”, and that technics is in principle available to any living being. But this seems just as anthropocentric: if animals could use tools, they would be just like humans. Gerald Moore, "Adapt and Smile or Die!: Stiegler Among the Darwinists," in Stiegler and Technics, ed. Christina Howells and Gerald Moore (Edinburgh: Edinburgh University Press, 2013), 27.
robustly from the biological body—equated by Stiegler with ‘stupidity’—rendering obscure just how technology affects the body. This problem cannot be overstated, since his basic position is that humans exist precisely at their point of separation from biological features. This approaches a denial that biology is an aspect of humanity.

This echoes debates in disability studies concerning whether impairment is a biological or social artefact. In Stiegler’s account, impairment would reside in the biological register, though it could radically be overcome by technics. This suggests an inability to address adequately a question motivating this paper: what role do technologies already play in disability? Surely biology and technology do not have separate causal histories? I’ll suggest that the very emergence of disability is enacted in and through relations between bodies and technologies, broadly construed, that regularise valued and disvalued properties.

A second problem concerns lack: Stiegler rejects a fixed biological nature for an equally universal foundation. That humans are fragile as a matter of empirical fact doesn’t warrant the overdetermination of this state

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17 It is not insignificant that Stiegler begins from Lacanian premises. As Thomas LaMarre notes, this lends his account a psychoanalytic tenor. The human must recognise and reconcile itself to its essentially fragile nature. Thomas LaMarre, "Afterword: Humans and Machines," in Gilbert Simondon and the Philosophy of the Transindividual, Technologies of Lived Abstraction (London: MIT Press, 2012).

18 This also entails a robust division between nature (locked into evolutionary adaptation and mechanistic repetition) and culture (liberated by technics to radically innovate). This is reminiscent of Sartre’s existentialism, that goes even further to effectively deny that the human has biological features. Roberto Esposito, "Politics and Human Nature", Angelaki: Journal of the Theoretical Humanities 16, no. 3 (2011).

19 My suggestion is twofold: first, technologies replicate purportedly natural human functions. The first follows from the aforementioned tendency to assume normal function as an objective fact, and to conceptualise technologies through that lens.

of affairs into an ontological ground. Crucially, taking humans as *equally* vulnerable engenders a homogeneous conception that flattens out bodily diversity, and the variable vulnerability that attends such diversity. More precisely, this claim can only find purchase by disregarding embodiment. Even assuming that we accept vulnerability as the human predicament, starting from concrete particular bodies (as does Simondon) would instead suggest heterogeneity, and vulnerability by degrees.

**Simondon and Individuation**

So, while Stiegler’s originary technicity looked promising, it doesn’t address the body’s own contingency, and its interrelation with, not transcendence by, technology. I’ll turn to Gilbert Simondon’s work to this end, before making some suggestions about technology’s role in the production of the human.

Simondon’s organising concept is individuation. This understands individuals in terms of process and relations. It can be characterised *very* roughly as follows. The individual can be understood only relative to the preindividual. These are not discrete substances, but phases in an ongoing individuating process. Individual structure emerges out of the *preindividual*. The preindividual is the condition for individuation: the reservoir of real potential, prior to structuration as an individual. It is always conserved after individuation, primed to spill over into further transformation. Alongside the individual, individuation also produces a specific, *associated milieu*, to which it essentially relates. This relation *between* individual and milieu is the ‘location’ of the preindividual. As

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21 This also instates a categorial divide between humans and nonhumans. Lack is a based in an oppositional logic of identity-in-difference.
Pascal Chabot writes, “[t]o exist is to be connected”.22 These relations are not accidents affecting a pre-given individual, but what bring that individual into being. The individual is not in relation; it is relation. An individual, then, exists as an unfolding trajectory. It is never self-identical or complete, but one phase of becoming, the temporary crystallisation of a set of preindividual potentials. While there is structure or stability, it is an outcome of ‘underlying’ operation or process.

**Simondon and Technology**

For Simondon technology is a kind of individuation: a movement from abstract to concrete, called *concretisation*. Invention begins with an end or predictable outcome in mind. The object in its primitive form is abstract: a blueprint describing an assembly of elements, each of which is a “closed system” with a discrete structure.23 During their ‘perfection’, elements take on extra functions that the original design did not anticipate. The technical object acquires a range that exceeds original intention “due to the superabundant efficacy of the created object when it is a true invention”.24 And, it gradually realises relations to an associated milieu. So, where the abstract object was entirely artificial—and identified with the inventor’s goals—a concrete object has a mode of existence irreducible to human artifice or natural law, that “approximates the mode of existence of natural

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objects”. To simplify: the concrete object has essentially an openness that the abstract object lacked. It is loosened—albeit not completely—from human origin and ascribed purpose. Perfection does not instantiate Platonic form, a complete, abstract thing given in one blow. It inaugurates a pattern open to dynamic transformation, an object with a higher degree of openness, a greater “margin of indetermination”.

Relational Disability

So, the basic insights of Simondon are: the preindividual—transformative potential—is primary; this gives both living and technical a fundamentally open, processual character. This is overlooked when attention is restricted to structure, which then becomes exhaustive of the individual or object, whose genetic operations are thereby ignored. Sure enough, the modern metaphysical chauvinism towards the self-identical submits such openness to a logic of closure, generating both an anthropocentric view of the human (as self-identical, self-contained and autonomous), and an instrumental view of technology (the ‘labour paradigm’). The labour paradigm doesn’t only address work, but rather describes a disposition towards technology—that affects life at all levels and scales—that ignores its genesis, its human relation, and above all its openness: “the inherence [in technicity] of values going beyond utility”. I’ll dwell on this a little before turning to Simondon’s positive implications.

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25 Ibid., 46.
26 True perfection only comes through concretisation. This is not defined via external criteria like utility or profitability.
27 Simondon, MEOT 11. Indeed, it is precisely indeterminacy that becomes concrete: “concretisation lies in the solidity of openness”. LaMarre, "Afterword: Humans and Machines", 92.
28 Simondon, MEOT 222.
This closure—of human and technology within themselves, and from each other—is surely significant for disability, grounding the abstract autonomy that underpins normal function (and that echoes instrumentalism). This allows humans to understand themselves as fully autonomous even as their actions are technologically-enabled. Yet this implies ‘context-transcending abilities’, which would in turn suggest a self-sufficient, complete human. As Stiegler rightly suggests, this recalls the state of nature, which represents “the absence of relation”.

Instead I’m suggesting that there is a banal, low level prostheticity to the average and everyday. Much apparent complementarity between ‘normal’ humans and environments is not spontaneous, but the outcome of activities, both historical and contemporary, that render the world thus through harmonisation with a valued functional ideal. Rather than a universally valid—that is, ‘normal’—mode, there are normalised relations that prioritise certain modes. Importantly, the underlying logic understands these relations as between determinate entities—the normal individual, the neutral tool—and remains at the level of structure, without attending to their engendering processes. Rather than ability or disability antecedent of situation, there are enabling and disabling relations. ‘Ability’ correlates less with innate features, and more with temporally-normalised relations between bodies and a world of technologies (broadly construed) that en-able them. Conversely, disability reduces neither to physical

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30 Stiegler, Technics and Time 128.

31 Put differently, ‘ability’ is not pre-existent but situationally-enacted.

32 This involves both long-term evolutionary, and short-term existential, timespans.
properties nor inherent lack.\textsuperscript{33} It is a spatiotemporal \textit{event}, that occurs where a merely atypical body encounters others with incongruent orientations, where affordances are absent or inapt.\textsuperscript{34} Disability and ability are relations between real bodies and technologies, where the contribution of the latter is effaced.

\textbf{Transductive Prosthesis and Technical Ethics}

Now I’ll turn to the affirmative register of Simondon’s thought, to make some suggestions for alternative ways to think the human-technology relation, which I’ll call transductive prosthesis: transductive because neither participant is entirely the agent, and every individuation is conditioned upon earlier individuations, that conserve their own potential for transformation. While Stiegler is right that technical evolution transforms the human, this is not based in compensation for vulnerability. There is nothing essentially lacking in humans (or any individual). They are instead characterised by potential to differentiate characteristic of the living in general.\textsuperscript{35} Humans and technological objects each contain this potential, essentially but differently. There is something human in technology, not because they are makers and users—which would fall back into a dualism of freedom and bondage—but because the technical

\textsuperscript{33} For this reason, I consider impairment a merely medical term with limited applicability, and do not consider impairment \textit{qua} objective abnormality part of the furniture of the universe. Henceforth I will use \textit{anomalous embodiment} to denote mere atypicality, and \textit{disability} to describe limiting situations based in assumptions that impairments \textit{are} objectively real.

\textsuperscript{34} The ‘normal body’ it is given implicitly at one pole of the body-world circuit, instantiated within milieus of various kinds. ‘Normal’ possibilities draw one in because these are taken implicitly as ‘what everyone does’, and because contexts advert to such affordances. So, environments solicit unrealisable possibilities: however effectively the wheelchair-user comports themselves, the environment welcomes a motility other than theirs.

\textsuperscript{35} Humans are but one vector within a continuity of living individuation.
individual is an elaboration of potentialities within humans. Technology doesn’t contradict the living. It ramifies it. Yet due to their openness, technologies retain a kind of quasi-agency that is not parasitic upon humans. The human-technology relation is co-individuation: a “dialogue between humans and machines” that engages preindividual forces in human and technology that individuate together. Humans are “conductors in the world orchestra of technology around them”, an orchestra of which they are also part. Simondon will explicitly suggest that the human is not a pre-given set of somatic or cognitive capacities, but a living being that enters into relations with technical objects in an associated milieu.

I’ll finally make three brief recommendations about disability-technology relations in a Simondonian key. First, taking individuation seriously means resisting closure and teleology in biology and technology alike. Remaining with structure only discloses regularity, and (somewhat) warrants the understanding of humans as (however imperfect) instantiations of ideal form. Instrumental understandings of health and technology leave their categories untouched, and reproduce metaphysical commitments to closure within individuality that occludes the reality and primacy of relation. A related point concerns technical objects. If these have a genesis and lineage that is implicated concurrently within human becoming, we should attend to the anthropocentric—not merely the human—in prosthesis. I’ve already mentioned the reduction of technology to productivity—due to the longstanding tendency to think the human...

36 Nonetheless technology is not constitutive in Stiegler’s sense. It is merely one—albeit highly significant—trajectory of individuation.
37 LaMarre, "Afterword: Humans and Machines", 98.
38 Technical evolution is not linear progress from object to object, but return to and reactivation of what is ontologically prior through “reimmersion in the preindividual".
technology relation analogically with mastery and bondage—that short-circuits technology’s potential. Perhaps technological solutions for disability implicitly tend towards normalisation not simply because of present economic imperatives, but also because productivity is sedimented within technology’s purported role or purpose.\(^{39}\)

The obverse practice attends to processes of taking-form. Such informing is not construction by humans out of passive nonhumanity. Simondon reontologises bodies: not as substances but as real trajectories of becoming. There is an ontology of disability. It is neither biological nor social, but individuated within many, real but contingent, relations that, through repeated practices, acquire an apparent fixity. It is this fixity might be contested, by recognising “technical concretisation and the transductive relation between humans and technology”.\(^{40}\) And, by following material processes that affect which bodies inhabit the world: how and why such productions happen, and that it could have been otherwise.\(^{41}\)

Finally, there is taking-up of potential towards a more open future. Liberating technology from productivity releases its inventive power. My former references to ‘the human’ were only pragmatic. I advocate a non-anthropocentric theory of technical relations that relinquishes emphasis upon merely abstract autonomy and function—with their implicit purity and closure—for plurality and connection. Invention can take many forms. There is moderate: pragmatic living-with-machines that substitutes


\(^{40}\) Donald A. Landes, "Individuals and Technology: Gilbert Simondon, From Ontology to Ethics to Feminist Bioethics", *Continental Philosophy Review* 47, no. 2 (2014).

\(^{41}\) Though beyond the scope of this paper, consideration of recent developments in biology that prioritise contingency over genetic determinism—niche construction, non-genetic evolution and development, autopoiesis—could be considered in relation to technology, to develop a robust, processual account of bodily-technological elaboration, without requiring that biology be transcended.
relational agency for individual autonomy. Technology still facilitates action. However, if technicity assists almost all action, invention is freed from approximation of normal modalities. Consider Christina Papadimitrou’s ‘becoming en-wheeled’: “a way of being in the world that is not merely mechanical or practical”.\footnote{Christina Papadimitriou, "Becoming En-wheeled: The Situated Accomplishment of Re-embodiment as a Wheelchair User After Spinal Cord Injury", \textit{Disability \\& Society} 23, no. 7 (2008): 691-704.} It may even create entirely new ways of acting. Or, rather than complementary or supplementary addition to bodies, an aesthetic and experimental elaboration. Importantly, as we’ve seen, individuation also brings with it an associated milieu. A new technical relation is simultaneously the creation of a new milieu. Of course, this is already happening in and with bodies everywhere, we just need to look for it, and keep bringing it to light.
Bibliography


