This chapter will discuss a profound and fundamental interrelationship between mind, body and technology in terms of what it means to be ‘human’, or, what ‘being’ human might mean. One historical, yet enduring, theory of the human subject is René Descartes’s philosophy of the mind distinct from the body – this is termed ‘Cartesian dualism’. Whilst this is a classical, if outmoded, model of conceiving of a philosophy of the subject, it also provides a useful conceptual framework through which to critique, and arrive at, a different concept of how the terms ‘mind’ and ‘body’ might operate. For example, the mind/body binary distinction can be interrogated and deconstructed to accommodate the role of technology as having an ontologically embedded position within the very definition of ‘humanity’. Indeed, ‘anthropogenesis’ – the very becoming of humanity – might instead incorporate the role of technological prosthesis to any mind/body dualism in defining the ‘human subject’. We will propose that this ‘dualism’ should be reconsidered for a fundamentally entangled mind-body-technology ‘trialism’ in the emergence of a distinct human being. However, at the same time, this interconnected relationship is also the object of power and control.

‘Know Thyself’

For Descartes, who found accommodation at the Anatomicum of Leiden University, and later Uppsala University,¹ one’s divine Self resided within a corporeal body. Instead of analysing

¹Leiden had influenced Olaus Rudbeck, who, with the patronage of Queen Christina of Sweden, developed Uppsala’s anatomical theatre in 1655 at the Gustavianum. Descartes had also attended the court of Queen Christina from 1649 until his death in 1650 and would have likely been an advocate. It is worthwhile to note,
Descartes’s famous phrase *cogito ergo sum* (‘I think therefore I am’), highlighting the primacy of the mind over the body, we might instead turn to the banner raised by the skeletal undead figure in Willem van Swanenburg’s 1610 etching of the Anatomical Theatre in Leiden (see Figure 1). The entrance of the Temple of Apollo at Delphi is also inscribed with the same phrase *nosce te ipsum*, or, ‘know thyself’. Indeed, the maxim reappears in numerous Renaissance anatomical manuals and depictions, specifically regarding the dissection of the human body. The words *nosce te ipsum* are also paraded by an almost identical figure to van Swanenburg’s in Bartholomeus Dolendo’s 1609 engraving *The Leiden Anatomical Theatre* (see Figure 3). The iconography suggests the process of *knowing oneself* was related to anatomical dissection of the body. The body is imagined as a site of knowledge whereby one’s ‘essence’ is extracted, or, excavated. It is this phrase ‘know thyself’ to which we shall return throughout this chapter.

Descartes’s *Treatise of Man* ² was contemporaneous with Van Swanenburg and Dolendo’s seventeenth-century depictions of the human subject. In his treatise, Descartes described humans as creatures created by God and having a distinct, dualistic body and soul. Descartes described the body as ‘nothing but a statue or machine made of earth.’³ It is therefore reduced to an organic shell wherein the ‘soul’ resides; the subject is a combination of biological material and immaterial mind. Descartes depicted this dualism himself (Figure 2). The body’s sensorial apparatus conveyed information to a soul that he believed was located within the pineal gland (marked ‘I’). The illustration shows the body at its most fundamental as a system of mechanical levers controlled by one’s ‘Self’ residing within the pineal gland. This gland, as the site of the soul, provided the ‘common-sense’ and ‘imagination’ to function as the nexus between body and mind. Descartes described a ‘touch’⁴ between soul and body at this single point. Descartes did actually speculate on the unison between body and soul, ‘I must show how these two natures would have to be joined and

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³ Ibid., p. 99.

⁴ We shall return to the notion of ‘touch’ at the end of this chapter in terms of how it is constituted today.
united in order to constitute men who resemble us’, but his emphasis, and the subsequent term ‘Cartesianism’, lies in the conceptual

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Figure 1. Willem van Swanenburg, *Anatomicum of Leiden University*, 1610.

Figure 2. René Descartes, *Treatise of Man*, 1662-4.
Figure 3. Bartholomeus Dolendo, *The Leiden Anatomical Theatre*, 1609 (engraving).
For Descartes, identifying the source of consciousness with a unique material object residing within a core location part of the brain offered a rather compelling solution (see Figures 4 – 5) to a philosophical, theological and physiological problem. We can observe in other practices, as Jonathan Sawday writes, ‘the anatomist would prise apart with his fingers the two hemispheres, in order to reach into the centre of the brain.’ We might speculate that this reflects a wider Western philosophical method of ‘truth’ residing in the ‘centre’ (logocentrism) whereby knowledge could be peeled away like layers to reveal an essential and foundational core or Platonic essence. It made logical sense, therefore, for the ‘soul’ to exist at the central core of the brain. Rembrandt’s painting The Anatomy Lesson of Dr Jan Deyman (1656) depicts this process (see Figure 6). And yet, perhaps in the excitement, or anxiety, of grasping an identifiable and locatable ‘Self’ within the body – through which anatomical dissection would deliver on its promise of ‘knowing thyself’ – a fantasy of the human body yielding its/self emerged. If the body was imagined as a crypt withholding knowledge of itself, the process of peeling and revealing the layers to uncover a central truth is portrayed in the popular representation of the self-flayed figure. In many cases, the corpse is seen to actively desire, to be complicit its own dissection, or even anatomise itself. For example, the self-flayed figure is repeated in Valverde’s Historia de la Composicion del Cuerpo Humano (Account of the Composition of the Human Body, 1556) to the self-disrobed figure of Berengarius’s Commentaria (1521), Vesalius’s De Humano Corporis Fabrica (The Fabric of the Human Body) of 1543, Spiegel’s De Humano Corporis Fabrica (1627), and Tabulae Anatomicae (1618) by Pietro Berrettini. Sawday suggests ‘the corpse desires dissection. She is as intent as any anatomist in having her inner recesses opened to the public gaze.’

Modernity’s ‘Embodied’ Mind

Descartes’s belief in the pineal gland as the location of the soul, despite its potential appeal, did not gain popular currency. Following his death, it was largely abandoned as a theory. Some objections to the idea derived from the discovery of a pineal gland in animal

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7 Ibid., p.112.
dissections. Others argued that Descartes’s identification of the gland’s location was incorrect. However, the principle of the brain containing the seat of the soul remained very attractive and dissections continued to search for something central in the brain that might resemble the mind. However, it was in nineteenth-century modernity that a radical shift occurred from quasi-religious theories of the soul residing within the brain as more contemporary forms of knowledge emerged.

Following the Renaissance, a Classical age began to profoundly question the received philosophical beliefs inherent in Naïve Realism and its notion that humans transparently experience the world as it exists. The Modern era overturned such ideas. In *The Order of Things*, Michel Foucault discussed this organisation of knowledge in the Renaissance, Classical, and Modern eras. He proposed that within the Modern era, an epistemological transformation occurred from knowledge of reality existing in an exterior, objective, and rational world to a subjective reality that was instead structured and produced through the human body. Descartes’s mechanistic, rather than embodied, conception of the human subject might however overlook his contribution, alongside John Locke, towards challenging the Naïve Realist view that perception is a direct reflection of external phenomena. Instead,

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reality was conceived to be a *resemblance* of the world through bodily ‘sense-data’. Therefore, whilst there was a mind-body distinction, there was also the proposal that perception, ideas and imagination existed differently to the external world the brain perceived (as depicted in Figure 4). Foucault identifies Descartes as contributing towards the age of resemblance, but as the nineteenth century arrived, there was a shift in the human being becoming the new object of knowledge. ‘Reality’ is no longer found in a hypothetical exterior world, but is instead *produced* by the body – a projection determined by the sensorial structure of the organism. Reality, for the human body and its conscious psychology, is produced instead through the psycho-physics of its embodiment. The emerging human sciences within modernity – psychology, neuroscience, anthropology, sociology, cognitive theory – partitioned, fragmented and intensified its study of the human subject as the active producer, not passive recipient, of its own reality. In modernity, ‘truth’ and ‘reality’ was relocated as being subjective and internal.

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8 The notion that animals had any soul, imagination, memory, or spirit comparable to humans was objectionable.
10 Such as mathematics and logic.
Jonathan Crary has written that modernity marks the ‘crisis of the subject’ after the ‘collapse’ of the universal model of the Cartesian optic as an objective, comprehensive relation to the world. But if the soul or mind could not be found and assigned an identifiable location, how could one ‘know thyself’? What, then, was ‘oneself’? Through an intensification of technique, the theatrical, sometimes even carnivalesque, spectacle of anatomical dissection gave way to more ordered scientific and medical discourses of examination, surveillance and mapping that characterised emerging institutional practices. The refinement and professionalisation of dissection further yielded truths within the body and about reality. The advent of the ‘human sciences’ within modern secular humanism led to technological interventions upon the body that provided new forms of knowledge. Tim Armstrong refers to the body in modernity as subjected to ‘a barrage of devices…resolved into a complex of different biomechanical systems, conceived in thermodynamic terms’.

Subject to the greater operations and surgical interventions made possible in industrial and technological modernity, alongside more refined institutional practices and medical discourses, the body continued to yield knowledge that contributed to its ‘crisis’. Crary’s characterisation of a ‘collapse’ of the Cartesian optic was founded upon retinal research in the eighteenth century. For example, Pieter Camper’s thesis on vision in 1746 studied how the eye’s different foveal sensitivities, astigmatism, and ‘blind spot’ affect vision and therefore how perceived reality is dependent upon the physical characteristics of human embodiment. Sébastien Le Clerc in 1719 proposed that the eye acquires knowledge through scanning the world ‘bit by bit’ instead of perceiving a total picture of the world. Philippe La Hire observed certain colours change within perception in low light levels. William Porterfield’s *A Treatise on the Eye* observed a transformation in the eye’s shape when focusing upon different distances. The intensified scrutiny upon the body is reflected in Crary’s argument that ‘the eye itself became a field of statistical information’. Charles Blanc developed ideas on the emotional effects of colours and lines, whilst in the nineteenth century, Charles Henry developed a theory of human perception based upon colour rather than geometric optics. Arthur Schopenhauer’s study of after-images, as J. W. Goethe before him, contributed to the thesis that reality was produced through the very condition of one’s embodiment.

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12 William Porterfield, *A treatise on the eye, the manner and phenomena of vision.* (Edinburgh: Hamilton and Balfour, 1759.
14 Henry’s work was known to emerging modernist painters such as Georges Seurat.
The refinement of procedures upon the body in order to extract further specialised knowledge about it therefore placed it at the centre

of knowledge. Instead of revealing a ‘core’, reality was found to emanate from the different physical structures of the body. Indeed, it was understood not to be a fixed, stable hypothetical object from which truth could be derived. And, as it appeared, knowledge was based upon sensation – which was itself highly unstable – so therefore ‘reality’ could not be more stable than the conditions from which it was produced. No longer was there a transparent relation in the embodied perception of an exterior world: ‘knowing thyself’ became a project of intensified techniques concerned with mapping the human body as the active producer of its reality.

The modern era therefore departed from existing regimes of knowledge. The human subject in modernity was studied through industrial and technological advancements together
with a refinement in anatomical techniques, no longer to extract the mind within the body, but to investigate how the mind was produced through the body. This marks a historical moment whereby ideas of an objective, exterior reality outside of the human body is replaced by an unstable, transient, and fluxive reality constructed through the structure and process of bodily operations. The establishment of the human sciences developed a new figure to accompany a transformation of knowledge: a subject of embodied perception as the producer of knowledge, meaning, and reality. Therefore, through developing the techniques involved in the anatomisation and dissection of the human body, instead of finding the soul within the body, the subject was the body. Both Ernst Mach and Henri Poincaré articulated how human relation to reality is projected from within the body and how we mistakenly perceive the world as being exterior to ourselves. For Mach, knowledge of the world ‘[does] not exist outside thought’\(^{15}\), whilst Poincaré declared ‘our perception of space is the product of an internal coordination of our various sensory faculties into a spatial gestalt we mistakenly identify as external to us.’\(^{16}\) Our contemporary ideas of reality being sutured from multiple, interconnected psychophysical projections emerged at this historical juncture.

**The Mind Through the Body**

If a particular reality is produced through a specific embodiment, we therefore might propose that any location of the mind must lie across and through the body. In effect, rather than the notion of the mind in the body, the mind is the body. One articulation of this idea is Didier Anzieu’s argument in *The Skin Ego*.\(^{17}\) Anzieu proposed that the skin has a particular intelligence of its own but is also a fundamental part of our enveloped psychological sense of self/’ego’; we can compare this notion of a ‘self’ located across the surface of the body in opposition to the Cartesian anatomising the interior core of the brain. Skin has both a tactile physical ‘intelligence’ but also a fundamental psychic role in the formation of one’s own ego. For Anzieu, the skin profoundly informs our concepts, knowledge and self.

Every organism has an embodiment through which its reality is constructed. Embodiment therefore forms the principle basis for which consciousness has relation to the world. It is perhaps significant that the surgeon’s hand of Nicholaes Tulp anatomises the hand

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of his corpse. The hand is an example of where our minds may also equally lie, where thought is generated via its structure and agency. Descartes’s illustration of the hand showed it to be a mechanical object activated through the mind – however we might instead propose something quite opposite, that the hand provides the conceptual framework for which the mind to exist. In other words, the mind operates, in part, according to the structure and actions of

the hand. The human hand has also evolved in response to external technological prosthesis, which in turn has transformed the framework of the mind through the very terms with which we engage with our perception of reality. Indeed, we shall come to consider this specific concept of technology as intrinsic to ‘knowing thyself’. In the moment of anthropogenesis, an embodied consciousness emerged that was capable of the conceptual framework required through which to use tools.

Jean-Luc Nancy argues that Descartes’s words dum scribo (‘while I am writing’) in Rules for the Direction of the Mind (1628) undermines the very philosophical dualism that Descartes proposed since Descartes’s text shows how ‘the mind shows itself in the body.’ Thinking exists through bodily action, or rather, thinking is a result of embodied process. The mind therefore exists within our bodies, and through the operations of the body. His argument is distinct from, but echoes Nietzsche’s comment: ‘Our writing materials contribute their part to our thinking’. We might trace Nancy’s argument further back through consideration of André Leroi-Gourhan’s ideas in Technics and Language. If the mind is formed, structured, and revealed through the body, then corporeal transformation – such as through evolution and technology – present the potential for new forms of thinking to emerge. Leroi-Gourhan argued that bipedalism (upright movement on two legs) allowed for new freedoms for the hands and face. The liberation of hands then developed the use of tools and the face became directed towards communication. As a consequence, cortical areas of the brain evolved; language, the very medium through which ‘I’ is enunciated, therefore emerged from being upright. Leroi-Gourhan proposed the development of the mind follows the development of the body – and what distinguishes humanity are essentially its tools and logic – therefore the mind follows the body, but also, its tools.

At the risk of simplifying Leroi-Gourhan’s thesis within this chapter, the emergence of tools characterises a unique and decisive moment in human evolution. In other words, technogenesis is directly linked to anthropogenesis. The birth of technology is also that of humanity. Technological use, which we may define as even rudimentary tools – for example a stick is the physical prosthetic extension of the arm, allowing for greater reach and range of motion, increased power through speed generated and reduced surface area with which to intensify the force, as well as becoming a disposable, replaceable object that can also be modified and adapted to other uses – was also the birth of a distinct primitive human. The use of tools reflects intelligence and imagination in the transformation of matter into an object and into the prosthetic extension of the body’s capacities to enact human will. The mind evolved as conceptual thought expanded across the coupling of body and prosthesis. This is what we might therefore consider a mind-body-technology ‘trialism’, in contrast to the Cartesian mind-body ‘dualism’.

Influenced by Leroi-Gourhan’s ideas, Bernard Stiegler has more directly proposed that humanity is technology. In other words, the history of humanity is that of the history of technology: ‘humanity’ is defined by its technicity. Stiegler writes: ‘techno-genesis structurally precedes socio-genesis.’ 21 Technology orders the very experience, knowledge, and understanding of humanity and its reality. It is not simply enveloped within human knowledge, but is integral to its transformation through the effect of its uses – here, as an instrument of power and dominance, or in modernity, revealing hitherto concealed dimensions of matter. From the emergence of the first ‘human’,

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our history has become dependent upon new laws of technicity rather than biology. Stiegler uses the term ‘epiphylogenesis’ to describe new forms of evolution through conceptual and
embodied transformation relative to our relationship to technology and tools. Human evolution is dependent and entwined with the development of technology through the connection, adaptation, and hybridity with things initially considered exterior to itself.

Stiegler refers to the Greek figure Prometheus. He recalls the story of how humans were forgotten when the Gods instructed the brothers Prometheus and Epimetheus to give attributes to the creatures on Earth. Epimetheus distributed attributes amongst animals, whilst forgetting humans, who were left bare, weak and slow. Without the means for attack or defense, humans were uniquely vulnerable. As a compensation for their pathetic bodies, Prometheus stole fire from the Gods and gave it to humans. Within the story, fire is symbolic of technology. As a technology, its deployment has a pre-requisite need for the capacity of reason, imagination and invention. These specifically human traits are therefore defined in the very moment it is able to engage with cognitive and conceptual frameworks required for using technology. The weak, vulnerable human is given a technological imagination that enables the body to become prosthetic by adapting and enhancing traits found within other creatures (weapons, armour, strength, speed, etc.). Therefore, in Stiegler’s reading of the Prometheus myth, the very ontological definition of humanity is a genesis co-existent with the gift of fire as the symbol of technology. Again, the definition of humanity is co-extensive with what is exterior to it. To be human, to ‘know thyself’ is to recognise one exists outside of itself as much as ‘within’ itself. The history of humanity is inscribed by ‘technical life’.

Within the context of massive industrial and technological forces within modernity, there flourished a range of writing from twentieth-century Western figures very much concerned with the role of technology imbricated within human existence. Sigmund Freud reflected in 1930 that ‘Motor power places gigantic forces at [man’s] disposal, which, like his muscles, he can employ in any direction... Man has, as it were, become a kind of prosthetic God. When he puts on all his auxiliary organs he is truly magnificent but those organs have not grown on him and they still give him much trouble at times.’ Just 34 years later, in Understanding Media: The Extensions of Man, Marshall McLuhan discussed prosthesis in relation to epiphylogenesis, arguing that media is ‘any extension of ourselves.’ For McLuhan, just as the wheel is an extrapolation of the foot, and clothing a second skin, so electronic technology is a prosthetic extension of the central nervous system. And, as with

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22 Significantly, the etymology of the name from the Greek pro for ‘before’ and manthano for ‘intelligence’.
Freud’s warning that human prosthesis both extends and disrupts, so McLuhan suggested that such technological prosthesis of the nervous system also causes an ‘autoamputation’ as ‘such amplification is bearable by the nervous system only through numbness or blocking of perception.’ We might therefore argue that in the very moment of such intensified technological extension of perception and experience, there is a simultaneous loss and a perceived obsolescence of the body’s own capacities.

In a letter to Pierre Trudeau in 1968, McLuhan hailed Salvador Dali’s cover of TV Guide, of the same year, as a ‘masterpiece…. The extension of the central nervous system via electricity.’ Dali was disturbed by television, believing it to replace human imagination. The German philosopher Martin Heidegger also perceived technological prosthesis as an amputation of the body, erasing its distinct, unique traces. He proposed that the human body becomes subordinate to the tools it uses. In Heidegger’s example, the typewriter replaces the inimitability of handwriting with a dead, mechanical ubiquity. This also echoes Nietzsche’s comment upon thinking being influenced by the media through which we use. Whilst technology is inscribed into the very historical development of human existence, modern thinkers were fearful of its excessive effects and the possibility of the body’s obsolescence and/or subordinate role within a mechanical age. Indeed, the issue arose that whilst technology could expand and liberate the human subject, the capitalist and political control of technology reduced actual being to becoming an operator; thinking becomes necessary only for operating technology. This was an issue of control: whom does technology serve? The promise of technology as emancipating human possibility disguised the reality of the human subject itself reduced to an instrument for operating machinery. Karl Marx warned of the human being as an ‘appendage to the machine.’ A number of thinkers, although just a few are mentioned here, were concerned and suspicious about the incorporation of technology within the experience of being human.

26 Ibid, p. 43.
29 More recently, Rebecca Solnit has characterised mobile technologies as contracting communication, despite once expanding it, referencing Virginia Woolf in saying ‘On or around June 1995, human character changed…undergo[ing] a metamorphosis that is still not complete but is profound.’ Rebecca Solnit, The Encyclopedia of Trouble and Spaciousness (San Antonio, TX: Trinity University Press, 2014), p. 256.
Andy Clarke’s and David Chalmers’s more recent paper ‘The Extended Mind’\(^{31}\) similarly proposes that technological objects become \textit{part} of our brains. They argue that we should reconsider a more expanded concept of the mind as cognitive adaption to technological objects require a flexible and extended brain.\(^{32}\) Clarke and Chalmers use the basic example of a simple notebook as an aide-mémoire for writing directions. For them, it functions as an adaptable, external prosthesis for memory; it supplements and extends the brain. ‘Extended mind thesis’ (EMT) proposes that the limits of the mind are not limited to our corporeality, but can flexibly incorporate other technological objects to its conceptual frameworks. As such our consciousness lies beyond our bodies and are projected into the technologies that we operate within the world. If we again question what ‘thyself’ is, it perhaps becomes profoundly related to the incorporation of others, or prosthesis, in the extension of oneself. The ‘self’ may therefore be a perpetual assemblage between an embodied subject having a fluid connection and interaction with technological prosthesis.

I have written elsewhere on the invention of photography and the prostheticisation of memory: ‘Memory and experience started becoming mechanically prosthetic, of which photography is one form, at the very moment humanity could no longer trust its own act of perception or remembrance’.\(^{33}\) Instead of guaranteeing memory, photography supplanted it. Our memories \textit{supplement} photographs that instead become the document and guarantor of truth (despite their limitations); we organise, renew and shift our own memories accordingly. Stiegler, however, warns that ‘Technicization is what produces loss of memory… hypomnemesis risks contaminating all memory, thereby even destroying it.’\(^{34}\) Stiegler describes hypomnemesis as the externalisation of memory through technical operations – such as writing and photography – and indeed perhaps any kind of process of making memory externally reified. Stiegler was a student of Jacques Derrida, who similarly wrote on the act of writing as prosthesis for memory: ‘between \textit{mnēmē} and \textit{hypomnēsis}, between memory and its supplement, the line is more than


\(^{32}\) Whilst McLuhan considered media as an extension of the nervous system, Clark and Chalmers argue that a smartphone is an extension of the mind.


subtle, it is hardly perceptible.\textsuperscript{35} There may be different forms of memory, and whilst they may blend to create a dominant memory-narrative, we should question the process and role of every ‘memory operation’ in constituting a holistic impression.\textsuperscript{36} If we recall Freud’s and McLuhan’s thoughts, the adoption of a technology transforms ourselves through both extrapolating and amputating the body’s own functions, we might apply that to the process of memory.

From a more scientific, biological basis, Cardinali et al.\textsuperscript{37} have proposed that tools are ‘absorbed’ into the inner representation of the body. Cognitive psychologists describe this as ‘body schema’. They argue consciousness relies upon a ‘somatosensory representation’ (body schema), and uses of technological objects transforms the subject’s conception of their bodily schema. They write, therefore, ‘The body is not a constant object.’\textsuperscript{38} We might reflect that whilst the incorporation of ‘exterior’ techniques rely upon a set of processes that requires consideration and analysis in terms of how they supplement/supplant the body’s ‘own’ operations, we should also remember the human being’s very definition relies upon those fundamental internal operations of externalisation. In that sense, nothing is truly ‘exterior’ or ‘interior’ since the human being’s unique characteristic – to remember Prometheus – is a profound interconnection with the materials of its environment in the process of extension, in becoming part of one’s self.

Finally, we should consider our own historical moment, now firmly within the twenty-first century. I would like to consider, albeit briefly here, one aspect of the mind-body-technology trialism in terms of how this is being negotiated. To that end, therefore, we will consider how mobile technology might fit within one’s ‘body schema’. As a recent mass medium, it is both initially exterior to oneself, and for Clark and Chambers undoubtedly an extension of the mind. It is also remodelling the way the world is experienced through the alteration of our conceptual frameworks. Indeed, as mentioned, the very act of harnessing technology requires an adaptation, a capacity to work within one’s mode of being and thinking. Yet by supplementing those, to take Derrida’s idea, it also supplants those

\textsuperscript{36} It is interesting to note current questions raised against Google regarding its production of cultural memory in an age where the political far-Right use ‘gaming’ to subvert and rewrite history, including the Holocaust. See Cadwallader, Carole, ‘Google is not ‘just’ a platform. It frames, shapes and distorts how we see the world’, 2016. Retrieved from https://www.theguardian.com/commentisfree/2016/dec/11/google-frames-shapes-and-distorts-how-we-see-world
\textsuperscript{38} Ibid., p. 478.
processes. And yet whilst Stiegler had raised the possibility of epiphylogenesis, or evolution through technical processes, the recent emergence of the term ‘nomophobia’ also reflects the fear and anxiety of being without mobile technology. Mobile smartphones have become so imbricated within subjectivity that their absence may lead to a sensation of loss, and even suffering. Shambare, Rugimbana and Zhowa\textsuperscript{39} describe mobile phones as today’s largest ‘non-drug’ addiction, whilst Mick and Fournier present technology as a ‘paradox construct.’\textsuperscript{40} They propose that it ‘provoke[s] conflict and ambivalence that simulate anxiety and stress’\textsuperscript{41} through being both emancipating and enslaving, creating control and chaos, constructing the conditions for both unison and isolation, and having the capacity for both efficiency and inefficiency.

Let us consider further the contemporary trend in mobile communication haptic interfaces as an application of technology to embodiment through the act of ‘touch’. We have already considered the possibility of an inseparable relationship between hand and consciousness as an argument against Cartesian mind/body dualism. However, with digital technology now ubiquitous through mobile consumer technology, the experience of one's world, and one’s subjectivity has, and is, undergoing a shift.

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The technological development of hapticity between the surface of the digital environment and the human hand recasts the sensitivity of touching from material to the immaterial. The subject moves from ‘producer’ of objects through tactile engagement with materiality, to a position of ‘consumer’ through simulated haptic interactions.

Susanne Østby Sæther’s essay ‘Gestures of Touch in Recent Video Art: Toward a New Haptic Mode’ considers a contemporary artistic turn responding to the dissemination of ‘consumer technologies of haptic interfaces and touchscreens.’\textsuperscript{42} Sæther refers to the physical and material indexicality, the \textit{industrial} touch, between grasping hand and material object in Richard Serra’s 1968 film \textit{Hand Catching Lead}. She sees in it a distinction to \textit{postindustrial} touching, something described as an ‘intangibility and lack of physical substance.’\textsuperscript{43} The conceptualisation of hapticity between Serra and contemporary video art reflect a wider


\textsuperscript{41} Ibid., p. 127.


\textsuperscript{43} Ibid., p. 36.
cultural shift from touch as a guarantor of presence to touch as movement without physical trace. We might also consider a related position taken by Richard Sennett in *The Craftsman*\(^4^4\) whereby he argues that people have become alienated from the materiality of their environment and the objects of their labour, but also, the control over tools (such as the hand’s grip when writing). Following that, we might also point to a temporal shift in materiality from permanent physical materials to temporary user-content, transforming the cultural experience of time and physicality but also control. The notion of craft as a durational, material process whereby one’s ‘grip’ is profoundly important, might reflect a way of locating or positioning oneself to the world. *Concepts of time, duration and knowledge must alter according to the technology through which they are experienced.* Again, to refer to industrial and postindustrial processes, duration has been replaced by immediacy. Control, as Sæther writes, ‘must here be understood to comprise both the activity of manipulating an item through touch as well as the experience of comprehending it’.\(^4^5\) This is reminiscent of Merleau-Ponty’s concept of the ‘subject’ being created through interaction with a world: ‘the normal subject penetrates into the object by perception, assimilating its structure into his substance, and through this body the object directly regulates his movement.’\(^4^6\) In digital haptic technologies we point, swipe and drag across a glass screen; hand movements become reductive when compared to the process of craft and the notion of the specialist tool becoming a part of one’s being and thinking.

Our uses of technology inform our very subjectivity as the control of materials through a tactile, physical relationship is a fundamental process for experience and knowledge, but also forming one-self, or, ‘knowing thyself’. Recalling Anzieu’s concept of the ‘skin ego’, haptic transformation could have profound consequences for the formation of ‘self’ and knowledge. Similarly, thinking back to Nancy’s notion of thinking *through* embodied acts and Leroi-Gourhan’s reasoning that the mind follows the development of the body through their entwined relation, this shift in the terms of embodiment has consequences for the concepts, knowledge and experience through which humans interact with the world. Echoing Marx’s idea of the human body as cog in a machine, the same argument could be applied to postindustrial, neoliberal culture whereby hapticity is reduced to choosing options in an algorithmic dimension whose operations are distinct from our own material existence. The


experience of the world is therefore increasingly mediated through consumer technology created through global corporations.

The shift from industrial modernity to postindustrial culture and the affect upon embodiment has concurrent affects upon other senses. For example, the deployment of technology in controlling the subject is reflected in Jonathan Crary’s study of vision within nineteenth-century capitalist modernity that saw ‘the collapse of classical models of vision…. Instead, observation is increasingly a question of equivalent sensations and stimuli that have no reference to a spatial location…[generating] techniques for imposing visual attentiveness, rationalizing sensation, and managing perception…and that never allowed a real world to acquire solidity or permanence.’

Looking at how this developed within the twentieth century, Scott Bukatman has discussed the relation between ‘heightened, even exaggerated, bodily awareness in relation to highly technologized environments’ with an alienated, anxious state of disembodiment within late-capitalist globalisation. He argues that Western culture has provided visual spectacles as a compensation against the loss of hapticity and the ‘centrality’ of sensory experience: ‘new technologies and social formations displaced the haptic in favour of the visual as a source of knowledge about an increasingly complicated set of lived realities…. The spectacle was a simulacrum of reality.’ In modernity, the experiential relation to material and environment was replaced by visual simulation and experience from behind, or in front of, a screen – from cinema to train-travel. Regarding the latter, for example, the body’s auditory, olfactory and haptic qualities of experiencing a place are replaced by an intensification of speed and related visual spectacle. Now in the twenty-first century, knowledge is increasingly generated through information acquired through computational touch over individualised embodied experience.

Sæther observes that the ‘haptic turn’ is not necessarily that of (post)modern disembodiment but rather, taking her argument from Giorgio Agamben, a fragmentation and intensification. Hapticity, in an era of unprecedented information, in one sense translates touch – one of the most basic forms of human agency – into the activation of countless

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49 Ibid., p. 82.
transparent algorithms and invisible calculations within a digital media economy: ‘the corporate attempt to coordinate the ‘natural’ techniques of the body with the ‘postindustrial’ technology of digital screens.’ Thus, whilst technology contains the potential for emancipation, again, it also creates the conditions for new systems of control through the hyper-constructed processes of its operation. The possibility of freedom and unique expression is illusory as it is located within a controlled digital environment. It is highly significant that the technology accessible to mass populations are conceived, designed, and disseminated through global corporations within late-capitalist, neo-liberal culture. The structural operation of communication media controls the experience and uses of technology, thereby modifying behaviour and thinking as cognitive plasticity incorporates, or extends into, that very technology. We might imagine the human body recast as an interface between different digital interfaces: operator of digital algorithms and the producer and consumer of media content. In the movement from industrial to postindustrial societies, mastery over technology in terms of tools has been replaced by the ability to navigate through information content and infrastructure. It therefore raises the issue, to return to the notion of *nosce te ipsum*, where does the ‘self’ exist, and how does it interact within the postindustrial transformation of the environment, framework and structure in which it exists? Does the ‘self’ exist to operate as the product of consumer and ideological choices in which it is arguably both positioned and constructed?

The role of technology has a foundational position in enacting human subjectivity.

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The subject is required to incorporate technique in order to be expressed through it. Technology emerged with the birth of humanity and has continued to have an increasingly sophisticated, pervasive and intensified relation to the horizon of embodied experience, self-conception and communication. It is the site of possibilities for human (epiphylogenetic) evolution, but is also the object of corporate and political power. The distinction between what might be positioned as uniquely human and distinctly technological is as fallible as the Cartesian mind-body dualism. In other words, the ‘essence’ of humanity lies not in a dualism, nor a mind within a body, but a ‘trialistic’ interconnection of mind-body-technology. Indeed,

human ‘essence’ is not interior within the body, but exists through it, even though that very body is adaptable and prosthetically transformable. The human subject may adapt, evolve, be enhanced, gain and lose attributes, so even purely biological evolution consists of loss as other attributes emerge. This chapter began from a notion that to ‘know thyself’ was to excavate the body in revealing the site of one’s ‘Self’. If Descartes imagined that the human soul resided within the mechanical body, we have seen how concepts of mind and body need to incorporate the role of technological prosthesis in the very structure and development of the human subject. Therefore, this notion of dualism can be rethought to incorporate the role of technology in ‘anthropogenesis’ as the emergence of the human began with harnessing exterior forces. Indeed, if Descartes thought imagination could be found in the soul, we might instead locate imagination at the nexus of a mind-body-technology trialism. Technology allows for both an increase and decrease in the body’s sensorial potential and can prosthetically alter the prior relation we have to the world. The mind-body-technology trialism gives rise to new concepts of ‘being’ human and forms of ‘human being’.
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