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MERLEAU-PONTY AND “THE FLESH” OF TECHNICAL SYSTEMS

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"Then she generated the light, and the sight of her room, flooded with radiance and studded with electric buttons, revived her. There were buttons and switches everywhere – buttons to call for foods, for music, for clothing. There was a hot-bath button […] There was a cold-bath button. There was a button that produced literature. And there were of course buttons by which she communicated with her friends. *The room, though it contained nothing, was in touch with all that she cared for in the world"* – E.M. Forster, *The Machine Stops* (1928),

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INTRODUCTION

Our experience of the world is invariably shaped by technologies. In particular, increasingly pervasive algorithmic and computational systems inform and frame the way in which we express and put ourselves forward in today's society. The way in which, and the quantity of, information that we take in daily, social communication and styles, voting systems, online or "cyber" wars, consumer data intake, and various other aspects are all fundamentally constituted through and by algorithmic systems. It is without doubt, then, that technology, and in particular the everyday use of technical systems, that needs to be investigated. But what in particular is it about these systems that drives this thesis? Philosophy of technology has taken centre stage in much philosophical debate of the last century, themes of which include conversations surrounding responsibility, the relationship between technology and science, metaphysical issues regarding the characteristics of technologies, ethics of algorithmic systems and their decision making processes, as well as various cultural and political approaches to the function of technology in society. This thesis, however, is interested in exploring computational systems from a phenomenological and ultimately ontological perspective. As I explore in Chapter one, the thesis hopes to tap into questions concerning the fundamental relationship between humans and technical systems, and I believe that working through a phenomenological approach first, and ultimately dealing with the foundational ontological structures that this opens up, will allow for us to move past and describe technical systems in terms that are not objective, representationalist, or instrumental, and that ultimately sit at odds with much of what has been established so far in philosophy of technology -that is, that technology as a tool. In the dawn of artificial intelligence systems, it is important that philosophy try to keep up with the potentialities that this new technology brings to the social, cultural, and political landscapes of human existence. As such, we need first make space for them as active beings on an ontological level. Moreover, this thesis also wants to put forward that it is in Merleau-Ponty's philosophy, that we can find, implicitly, important and path-breaking configurations of experience and of Being that can accommodate the project of reshaping and thinking through human-technical relations.

Merleau-Ponty's philosophical work includes phenomenological accounts of *embodied* perception and experience (*Phenomenology of Perception*, 1945) as well as a nuanced and complex account of our Being in the world (a structure he refers to as "the flesh of things") in his later work *The Visible and The Invisible* (1969). To explore the ways in which Merleau-Ponty's work can be used to map out a new way of thinking about our ontological and experiential relationship with technical systems, the overarching research question that drives this project is as follows; **how can we make use of Merleau-Ponty's notion of embodied 'flesh' to explore the ontological grounds of the**

relationality *between* humans and technical systems? In order to answer I will first contextualise and introduce the connotations of technology in philosophy so far, especially working through thinkers in the twentieth century such as Ellul, Mumford, and Heidegger. In this first chapter, I will also define what it is that I mean by "technical systems". This chapter works to narrow the parameters of the project and to make space for Merleau-Ponty as a thinker in philosophy of technology. In the second chapter, I ask; what is perception for Merleau-Ponty? This chapter serves to introduce and describe the core tenets of Merleau-Ponty's earlier phenomenological thinking. In particular what subjective experience, perception, and the "body schema" are in Merleau-Ponty's philosophy, and why it is important to consider these facets within the greater project of rethinking our relationship with technical systems. This description of perception will build up to the questions and analysis presented in the chapter three, which will ultimately work towards a phenomenological analysis of technical systems. Indeed, in Chapter Three going forth will ask; what does this account of perceptual experience mean for our relationship with technical systems? In this section, we will see an exploration of the notion of habit for the use of tools, and a look at Merleau-Ponty's example of the blind-man and his cane to construct a phenomenological analogy between this example and our everyday interaction with technical systems as phenomena. Moreover, I will ask, "how far does such an account take us?", in order to draw up some limitations that the philosophy espoused in Phenomenology of Perception confronts us with. This too will allude to and open up to final and decisive chapter where I ultimately answer the research question through the exposition of the flesh.

I hope to show that in understanding technical systems as interpretative, embodied, active beings and then framing their relationship with human subjects through the lens of the flesh we can take steps in complicating the teleological or monodirectional "use of technology as a tool" line of thought which posits humans as subjects and technical systems as objects for use – this can also help us to further a philosophy of technology that criticises the anthropocentric worldview. An appeal to Merleau-Ponty's ontology of 'the flesh' and to the notions of 'the visible' and 'the invisible' allow for us to describe the different 'chiasmic' levels of relationality in the world and as such graft a space for technical systems to exist within specific but ontologically valid schema of interactivity between human subject and computational system.

(I) TECHNOLOGY

Before I can in earnest set out to begin my project, I need first tackle two fundamental underpinnings of this thesis. First, asks the question: what kind of technology is being discussed? I want to be as precise as possible as to what I mean when I say a "technical system", a "computational system", or indeed an "algorithmic system" - for these general terms, if not properly defined, will ultimately hinder the phenomenological description and eventual ontological analysis that this paper hinges upon. I want to be clear as to what the real object of analysis is in the first instance before moving into an exploration of technology and the nexus of being it gives rise to. This is the first task of the following chapter, but beyond this lies another, pivotal, question - one which maps out an underlying but essential concern that this entire thesis seeks to deal with. It asks; *how* is Merleau-Ponty a philosopher of technology? At stake is to present his philosophy as an approach to technology that does away with instrumentalist, or teleological accounts of *our interaction* with these systems by applying his notions to our experience of technology. In other words, I want to test Merleau-Ponty's philosophy against the increasingly foundational and everyday phenomenon of technology to understand its ongoing relevance as a fundamental philosophy for our relationship with the world. The combination of these tasks, to on the one hand set out to define with specificity the technical systems I will engage with and to, on the other, hand try to allude towards the relevance of Merleau-Ponty's philosophy for technology. This will open up decisively the first step of my project and will allow for me to begin with a phenomenological account of perception of technology (see Chapter two). I will in this first section present explicitly what I mean by "technical systems", "algorithmic systems", "computational systems" by describing and giving examples of particular technologies that engage us and with which we are in relation. I will also here make my first attempt to carve a space for Merleau-Ponty's ontology in the discussion around technology.

I.i TECHNOLOGY & PHILOSOPHY IN THE 20TH CENTURY

With a boom in technological innovation towards the end of the nineteenth century and throughout the twentieth century, technology increasingly became an issue for philosophers. Its rapid development taking hold of and reshaping our political and social landscapes, as well as throwing into question our very mode of being in the world – we see at this point the term "Philosophie der Technik" first being coined by thinker Ernst Kapp in 1885 (Mitcham 1994, 20-21). Starting with the Industrial Revolution

and its various inventions such as the electrical telegraph (1840), all the way to the explosion of technological advances in the latter half of the twentieth century - first atomic bomb detonation (1945), first electronic computer (1946), first human in space (1961) and then to set foot on the moon (1969), first successful in vitro fertilisation or "test-tube baby" (1978), first video call (1970), first artificial heart implanted (1982), invention of the internet (1983) (and the list goes on); there has been without doubt a massive shift in the fabric of the world.[1] Our capacities, facilitated by technology, have expanded in almost every direction - our capacity to heal, to explore, to see into the scientific depths of nature (both on a macro and microcosmic scale), our capacity to communicate with one another, and our capacity to consume and produce information have all been excelled and altered. And with this, inevitably came a demand to reflect and evaluate how we thought about these technologies surrounding us.

The philosophy of technology of the last century has tackled an array of approaches to the "problem" of technics, given this aforementioned encroachment of technological advancement into our lives. We see that two main branches within the field that, according to Mitcham, can be discerned as; "Engineering Philosophy of Technology" and "Humanities Philosophy of Technology" (39). The first is an analysis of technology "from within" – in other words, a philosophy that posits a way of "being-in-the-world" that is inherently technological, and that this technicity of being demonstrates a model for structures of thinking and of acting (Mitcham 1994, 39). The latter, and that which is ultimately relevant for this paper, is instead "an attempt of religion, poetry, and philosophy to bring non- or trans-technological perspectives to bear on interpreting the meaning of technology" (Mitcham 1994, 39). Within this particular philosophical offshoot, technology is often placed in opposition to human existence and it is as such that "Humanities Philosophy of Technology" appears as "a series of rear-guard attempts to defend the fundamental idea of the primacy of the nontechnical" (Mitcham 1994, 40). Indeed, clear outliers here are philosophies of technology that voice scepticism and critique over and against the ever expanding role of technology and its overarching, formative, structures within society as well as its dominance over nature. These reflections range from issues concerning the ethical, economic, and political implications to the socio-cultural, anthropological, and historical impact of technologies on our experience of the world.

Most notably, thinkers like Jacques Ellul stand out with his account of "la technique" in *The Technological Society* (1964). Here "la technique" stands apart from "technology" in that it does not refer to "the machine nor to a collection of machines, methods, and products" (Ellul [1964] 1980, 17).

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[1] A list and chronology of the most influential and relevant technological advances for philosophy of technology is presented in Mitcham's opening pages - giving a clear overview of the rapid pace of innovation but also the consequential political and social events attached to them. Carl Mitcham. "Introduction- Thinking about Technology". *Thinking Through Technology: The Path Between Engineering and Philosophy***.** University of Chicago Press. (London). 1994. pp 2-6

Instead, Ellul's term delineates a "complex and complete milieu" that excludes natural reality and through which we, as human beings, must define ourselves and live in – the most pertinent example of this that he provides is a city (7-8). The emphasis thus being that "technique" represents a particular context of human existence that is both separate from and exploitative of nature. As such, we see that Ellul scrutinises the way in which modern technology methodologically organises society through its stress on efficiency and reason. The systematicity of "la technique" is most clear when he states that it is "the totality of methods rationally arrived at [and aiming at] absolute efficiency (for a given stage of development) in every field of human activity" (1984, 138). For Ellul, this type of society steers us towards what he forbodes as a "dehumanisation" in the face of adapting to and accepting structures of technique (136;140).

Also within this tradition, we find Lewis Mumford, who in his *The Myth of the Machine Volumes I & II* (1967), presents a notion of "technics" that represents the "wishes, habits, ideas, goals (…) and, industrial processes" of a society" (190). Here he criticises the trend of "megatechnics", and its ultimate failure to produce lasting products through its continuous emphasis on expansion, production, and replacement (203). Mumford's critique draws upon a genealogical commentary on the human/technic relationship throughout history and ultimately focuses on the detrimental socio-cultural and socio-economic aspects of modern technology. But more than this, in *Myth of the Machine,* Mumford focuses on demythologising the notion of (mega)technics in an attempt to "initiate a radical reorientation of mental attitudes that would transform monotechnical civilisation" (Mitcham 1994, 44)

There are two crucial things to note then within this trend. The first is the use of terms such as "*technics*" or "*la technique*" to reinforce the overarching idea that technology is a organising sociological force or phenomenon that is irreducible to one concrete technology– it is instead representative of an entire system of technics that increasingly serves to shape, arrange, and alienate us from our human nature. That is, that society has taken on the characteristic of the technic, which has in turn come to define and shape the structures of modes of human existence. This is important because whilst these thinkers take note of specific technological examples within their work to further their philosophical thought, their ultimate focus is the wider anthropological impact of technology as an overarching force. Their theory is informed by the political, the economic, the social, and the historical. My thesis, and the key insights that it will express, will not be directly informed by these fields – however the conclusions it draws will certainly have wider implications for thinking about human/technics relations, and my hope is that it will spill over into the socio-political and anthropological. Instead, for this project, my focus is Merleau-Ponty's general ontological system of relationality (the notion of "the flesh" presented in Merleau-Ponty's chapter 'The Intertwining and the Chiasm' from The *Visible and the Invisible* (2000)), whose philosophical observations will attempt to

uncover and express new ways of thinking about being in the world with specific technological systems. It is also worth noting that whilst I discuss "technical systems" in my thesis, I do not refer to the formative sociological terms mentioned above. Rather, my use of "systems" refers to our everyday use of the word "system" when we talk about our mobile phone or laptop for instance - a complex collection of parts that work together within an interconnecting network. I will define this more clearly later in the final section of this chapter; part *I.iii*.

The second point is that within this trend of technological scepticism, a dichotomy appears between human and non-human, between technic material and organic activity, and between nature and technology/science. The play between such themes, although I've admittedly simplified arguments here, can all in some iteration or another be found within the works of both Ellul and Mumford, but also in Heidegger's work, *The Question Concerning Technology* (1953) for example (more on his work later). The presentation of these opposing notions unfolds in a few key ways. These dichotomies are often weaponised against the ever expanding reach of technology over and against nature or man's "natural" disposition (that is, his interpretation of the world without technological society). Mumford's point that the human being is *homo sapiens* before she is *homo faber* demonstrates this, that as beings it is our propensity for thinking and for hermeneutic and linguistic, interpretation of our world that takes primacy over the tools with which we realise our ideas (443). Indeed, there emerges a complex ontological relationship between man and technic wherein the latter is presented, if given primacy, as a problematic way of being in the world. This will, if not properly scrutinised, ultimately skew our relationship to ourselves and to nature (often resulting in subjective alienation or to an exploitation of nature). This paper, whilst focusing heavily on the ontological relationships that shape our human/technic interpretation, will not tie itself up with these kinds of underlying thematic dichotomies. In fact, through my exposition of Merleau-Ponty's philosophy as relevant for technology, my thesis will try to move away from such distinctions for two main reasons. The first is to distance my project from general social or ethical commentaries on technology and to focus on a detailed philosophical project of fundamental ontological relationality; in short to narrow the scope of the problem at hand. The second is to put forward the idea that fixed ontological oppositions concerning technology are not consistent with our experience of it – our relationship *with* technical systems runs two ways in terms of constitution. This multi-constitutional relation is exactly that which requires more precise attention at the most basic level, and which also underlines a core tenet of this project. As such, to refer once more to my definition of technology in this paper – it does not sit in ontological opposition to human subjectivity.

I.i.i HEIDEGGER AND TECHNOLOGY

Perhaps the most influential thinker who has tackled the problem of technology in the twentieth century, and who is particularly of note, is Heidegger. I want to take a moment to briefly talk about his body of work aimed at the issue because his account of technology is complex and, at face value, shares much of the same aims as my project. In particular, the rejection of instrumentalism and the teleological conception of technology as a means to an end. There are, however, crucial differences that set my account apart and that reveal why Merleau-Ponty's ontology over and against Heidegger's is important for thinking through our relationship *with* technology.

Indeed, Heidegger's *The Question Concerning Technology* (1954) and the additional four lectures aimed at answering the question "What is technology?", served as perhaps the most damning critique against technology and its overarching impact on the human being. However, it would be a mistake to think of Heidegger's account of technology as a kind of homogenous rejection of the phenomenon (Mitcham 1994, 51). In fact, Heidegger's scrutiny is seated in a rejection of traditional *ways of thinking about* modern technology and so places itself within a multifaceted critique that is concerned with the weaknesses surrounding our perception of it as a neutral means or as a fundamentally human activity (Heidegger [1954] 1977, 4). In his investigation into the question "What is technology?", Heidegger is primarily interested with what he calls "the essence of technology", something that is quite distinct from technology itself. Indeed, their difference is marked in his argumentation by referential characteristics and distinct ways of being in the world (*causa*). More specifically, that technology refers to specific machines (or scientific methods), whereas the *essence* of technology is the underlying ontological structure *of the technological*, that which sits in relation to humans and to nature but is itself not technological (an emphasis on the essence or "whatness" of technology is consistent with Heidegger's overall project of thinking through structures of Being or *Sein*) . To make this clear, Heidegger says; "Technology is not equivalent to the essence of technology. When we are seeking the essence of "tree", we have to become aware that That which pervades every tree, as tree, is not itself a tree that can be encountered among all the other trees." (5) For Heidegger, to think of technology in terms of what each artefact or thing does is to see it as a merely neutral force through which to achieve particular ends – this is inherently problematic because it "makes us utterly blind to the essence of technology" (ibid., 4). That is, to be blind to the underlying transformative and structural processes that occur on the level of Being. And so, to focus on the essence of technology, one too must strip back this conception of technology as merely instrumental. Instead, Heidegger proposes that technology is, at its core, a kind of revealing [*das Entbergen*] (in particular, a challenging/*Herausfordern*] or "setting-in-order" [*bestellte*] of Being (12; 15). What does this mean?

To answer this, it is important to note that this characteristic of "challenging revealing" belongs to modern technology in particular, which is distinct from earlier technologies (such as the windmill or waterwheel) in that "it is based on modern physics as an exact science" – such as a coal-fired power plant that makes use of electricity (Heidegger [1954] 1977, 15). If we turn back to the example of the windmill or waterwheel, we see that whilst both harness natural energy to serve human ends, they nonetheless remain dependent on nature in that they simply transfer motion. Neither of these technologies could function if the wind did not blow or the river did not flow (13-14) (Mitcham 1994, 51). In contrast to this, modern technology exploits the earth in a novel way, one that "challenges the energies of nature" in that it unlocks, exposes, and then stores energy for the purpose of yielding the maximum output but at minimum expense (Heidegger [1954] 1977, 15). That is to say that instead of "bringing-forth" into being in the sense of *poiêsis*, modern technology's defining characteristic of revealing is its capacity "to open up, to transform, to store, to distribute, to switch" (16). Heidegger calls upon the example of the hydroelectric plant on the Rhine River to clarify the implications this has for an ontological understanding of modern technology. Here he says, that in the process of collecting energy from the hydraulic pressure built up in the dam, that;

"Even the Rhine itself appears as something at our command. The hydroelectric plant is not built into the Rhine River as was the old wooden bridge that joined bank with bank (…) Rather the river is dammed up into the power plant. What the river is now, namely, a waterpower supplier, derives from out of the essence of the power station (…) The Rhine is still a river in the landscape, is it not? Perhaps. But how? In no other way than as an object on call for inspection by a tour group ordered there by the vacation industry." (16).

Two key points become clear here. The first is that to see a power plant only as an instrument is to overlook the fundamental ontological "challenging-forth" that modern technology brings about in nature, and crucially, that it distorts nature in some way by means of a "setting-upon" that expedites natural energies (17). Second, that modern technology challenges also the notion of "thingness" when it stores and transforms energy. It reduces unique things to mere resources, awaiting a purpose to fulfil – this is what Heidegger means in the final line of the above citation about the Rhine River. We see that what is important for Heidegger is not the instrumental value of technology as a tool to accomplish certain ends but rather its essence as a transformative and exploitative force on the level of Being.

The ongoing prevalence of modern technology within human life pushes Heidegger's ultimate argument towards the notion of *Gestell* (Enframing). *Gestell* is a "name for the essence of modern technology" (20) and is essentially tied up with a fundamental danger for human beings because it is, in short, a technological attitude towards the world. Its Enframing "threatens man with the possibility that it

could be denied to him to enter into a more original revealing and hence to experience the call of a more primal truth" (28). In other words, the ontological force of modern technology as an enframing revealing, as a challenging or a setting-upon of Being plays out simultaneously as a concealing of the most fundamental and basic structures of Being itself.

With this in mind, we can perhaps see how Heidegger's philosophy of technology falls in line with what Mitcham calls the trend of "Humanities Philosophy of Technology" in that ultimately there exists a thematic scrutiny of technology that pits human "natural" existence against the scientific or technological worldview. Heidegger's critique is more complicated than this, however, because modern technology "whose essence is Being itself" (31), cannot be simply rejected outright. Our relationship with technology is a working through and a thinking through technology in order to overcome it; in much the same way one overcomes pain for example (Heidegger [1954] 1977, 31). We cannot therefore simply negate technological forces in our lives as invalid, given that they are fundamentally entrenched both in our Being and our ways of thinking about the world, but instead we need to bring forth the issue of technology as something to consider. As such, in the final analysis, what is of greatest value to Heidegger is the act of thinking-through itself that comes with a calling into question and problematising the phenomenon of technology at a fundamental level. To accept an everyday account of technology that conceptualises it as a mere tool or instrument that serves human ends and that does not consider the formative processes at play within modern technology is to lose sight of both the truth and "extreme danger" technology puts forward (33).

Heidegger's nuanced ontology of modern technology and his ultimate conception of *Gestell*, bring to light some crucial aspects for this thesis. Whilst my use of Merleau-Ponty's thought will differ in some substantial ways, there are a number of important shared objectives that are worth (re)iterating. I will begin by discussing these before distancing myself with certain aspects of Heidegger's account.

A primary shared aim between Heidegger and this thesis is an emphasis on the need to rethink our relationship to technology. The act itself of re-evaluating the critical role that technology plays in our lives allows for us to reconceptualise and present new ways of dealing with technology philosophically. Heidegger's underlying point that we need to problematise the status of phenomena around us underscores an ongoing and pervasive issue within our thinking about technology. That is, that technology acts merely as a means to an end. Indeed, to think of technologies around us as tools only is to undermine entirely their status as active beings in the world. Moreover, that this is an inherently anthropocentric view that itself blurs the reality of our relationship with technical systems. Along this vein, this paper will reject an instrumental or teleological account of technology in favour of an investigation into an ontologically open-ended relationship with technical systems as active beings or agents. This demonstrates Heidegger's critique as a valuable starting point in thinking about technology

on the level of Being. However, there are some fundamental aspects within his account from which I want to take a distance and establish a different way of conceptualising the question of technology – reasons which stand to support a Merleau-Pontian approach to the problem.

A key distinction is Heidegger's preoccupation with characteristics of technology as a revealing and its movement ontologically as a poietic force. My analysis of technical systems is not concerned with this facet of technology. That is to say, I will not be broaching the way in which technology acts, at a fundamental level, as a bringing-forth or as a revealing. Instead, my investigation's primary focus is the nature of the relationship *between* human subjects and technical systems. Between myself and this system before me with which I am faced and with which I interact. This insight highlights another reason why I distance myself from Heidegger's account. That is, that my analysis is not, in the first instance, concerned with the fundamental impact that technology on Nature and with (hu)Man but instead on what occurs on the everyday interaction between myself as an active being in the world and specific technologies that are also active beings in the world. I want to move away from overarching or archetypal accounts of technology that engage in fundamental dichotomies (natural versus technological, man versus technic, nature versus technology) and turn my focus instead towards a detailed and specific account of what it means to be in a relationship with computational systems. In other words, a narrowing in on technical systems and their place in the world as opposed to an account of Technology. To place technology within such a general narrative is to on the one hand imbue it with an almost ungraspable mysticism, and on the other to overlook the basic everyday interconnection that technical systems have with us as individuals in the modern world – it seems an up-to-date ontology of technology needs to be attempted, one that takes seriously the project to decentre anthropocentric accounts of technology that rely fundamentally on the subject/object dichotomy.

Having so far discussed what I do not mean by technology, and in some moments presenting the overarching objective of my project, I will now broach the definition of technology that will be dealt with in this thesis and most critically show how Merleau-Ponty's philosophy is relevant also within the realm of thinking through technical systems.

I.ii. TECHNICAL SYSTEMS & MERLEAU-PONTY

Throughout this chapter, I have so far provided various negative definitions to the question I posed at the beginning – “what do I mean by technology?”. What has, hopefully, become clear is that my definition seeks to distance itself from a general account of “Technology” with a capital “T”. An account that is otherwise tied up with social, ethical, political, and historical accounts of our relationship with

overarching systems of technology and *the technological essence* as formative to our various modes of interaction and structures of existence. And so, having described in some detail what it is that I *do not* mean, I will now venture to define technology as it will be used for this forthcoming exploration into our *everyday, ontological,* relationship with computational, technical, and algorithmic systems *specifically*.

Indeed, to be as precise as possible, these terms need to be unpacked given that each has become so common in everyday language that their meaning is now almost obscure in its habitual use. It becomes an important philosophical investigation to look more closely at these terms so that we might uncover the different levels of meaning that lie within. We can begin with the term "technical", which usually denotes something of either scientific or mechanic origin[2]; it can also refer to something precise or methodological when applied within a certain discipline.[3] I want to focus on the mechanic aspect of "technical", in particular, the idea of a machine. A machine can be any "tool" - a hammer, a lever, a wedge, a pen – at the simplest level. But, what is the nature of my relationship to the technical as such? To think of machine in this way is to tie it up with the tangible, material world, or the *res extensa*. We hold a tool; we touch and use a machine, and in this sense, it is an immediately present *object* for us. To think of the technical in this manner, once again falls into thinking in teleological terms whilst also reducing the technical merely to objects in the world.

However for the most part, a machine is more complex than this, defined generally as, "an apparatus using mechanical power and having several parts each with a definite function and together performing a particular task"[4]. On a basic level, we see that machine is always and already tied up with the notion of a system and interrelated movement between parts. As such, when I say "system" in this context, I refer to a complex collection of parts that work together within an interconnecting network[5]. Therefore, we can now say that a "technical system" denotes the mechanistic relationship between one and many parts of a machine that joins it to the multitude of the whole network of functions. A nuclear power plant is an example – with many different processes and functions occurring at once (e.g., electricity generation, heating water, nuclear fission) at different locations of the plant which are intricately interconnected in such a way that the entirety of it can be called a technical system. However, a nuclear power plant, a door handle, a car engine, or any kind of technical system defined within the above parameters does not take the form of an *active being* in the sense that it does not compute and make sense of its own environment *independently*. Each individual part within these systems play its role

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[2] "Technical." *Merriam-Webster.com Dictionary*, Merriam-Webster, Accessed 6 Nov. 2021. https://www.merriam-webster.com/dictionary/technical.
[3] ibid.,
[4] "machine, n." *OED Online*, Oxford University Press, September 2021, Accessed 6 November 2021 www.oed.com/view/Entry/111850.
[5] "system, n." *OED Online*, Oxford University Press, September 2021, Accessed 6 November 2021. www.oed.com/view/Entry/196665.

without want or need for interpretation or adaptation *from within.* The hinges on my door frame do not calculate the *meaning* of my hand's weight for its functions when it begins to move to allow the door to open. In short, this kind of technical system does not interact with us and with the world in the same way as *computational* system. And so, when I say "technical system", I mean a technical system that is tied up with computational processes - computational systems are peculiar in their capacity to interpret environmental situations and contexts. Before I move onto the significance of this for an ontological investigation into human-technical relations, let me first elaborate on the notion of computation.

What does "computational" mean? In what way is it related to the idea of "technical system" as espoused above? To compute typically refers to a process of calculating, evaluating or making sense of something – in most instances this something is information, and it is carried out within a mathematical framework[6]. When a machine goes through this process it is referred to as a computer[7], I refer particularly to digitally automated electronic devices. Often, computational is used interchangeably or in close conjunction with algorithmic systems and processes - this will also be the case within this paper. More specifically, an algorithm is an automated computational process whose capabilities range from problem-solving to decision-making, to data-processing to, what is called, "automated-reasoning". This computational aspect of technical systems has raised much attention in recent literature concerning a new way of thinking about technology of this type. An example of this is Katherine Hayles's notion of "nonconscious cognition" presented in *Unthought: The Power of the Cognitive Nonconscious* (2017). Here she calls upon a mixture of embodied psychology and cybernetics discourses to further the thesis that technical systems are cognitive and as such need to be considered as valuable and undoubtedly active agents in the world. Hayles espouses that technical systems are cognisant to the extent that their underlying computations and "process(es) interpret information within contexts that connect it (this process) with meaning" (*U*, 22). The inclusion of both process and context within this definition allows for Hayles to account for a dynamic and ongoing interpretation of information on the basis of environmental stimuli within a particular context. Furthermore, that this interpretation of information places technical systems within the realm of meaning makers in the world. Continuing this line of thought from Hayles, I posit that computational or algorithmic systems do much more than simply store or transfer data. They also *engage* with the information provided to them to act and make choices. This involves complex and multifaceted processes of information interpretation, the active "reflection" concerning environmental stimuli based on a series of inputs and external events. As such, technical

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[6] "compute, n." *OED Online*, Oxford University Press, September 2021, www.oed.com/view/Entry/37973. Accessed 6 November 2021.

[7] Swaine, Michael R. , Hemmendinger, David , Freiberger, Paul A. and Pottenger, William Morton. "computer". Encyclopaedia Britannica, 6 May. 2021, https://www.britannica.com/technology/computer. Accessed 4 November 2021.

systems in this paper includes essentially the computational and algorithmic processes that take place "within" a device.

Ultimately, when I use the term "technical systems" I do not mean a door hinge but a computer - a device/machine- and its underlying network of connections and processes that connect it to its environment. I mean, for example, laptops & computers, mobile smartphones, tablets, and smart televisions, or even automated drones. In short, devices that make use of algorithmic systems but who sit in a direct relationship to human beings. The term "technical system", as it will be used throughout this paper, therefore has two crucial facets. On the one hand, they are machines and devices, material and tangible. On the other hand, their existence takes place also at the level of interpretation. That is to say, that a technical system is at once an object and something more - a system of processes that *interacts* with the world in which it finds itself through an interpretation of that world. When I interact with my mobile phone, I am in a tactile and objective relationship with the device I hold in my hands, but I am also in a relationship with it as an interpretative and constitutional being. It "senses" me through my interaction with it and absorbs, mediates, and extends me through it. But more than this, it constitutes my seeing it, experiencing it, and being *with* it through its process of interpreting environmental stimuli (informational and tactile) - both of these assets are what define technical systems as such. To be clear, technical systems' mode of Being is active in that it has the characteristics of independent *interpretation*, *decision-making*, and fundamentally, *interaction* **with** human subjects.

This particular way of being sits at odds with the traditional notions of subject and object and throws into crisis the conception of technology as mere means to end. To raise technical systems out of category of object is consequential for a few reasons. One is that it challenges the anthropocentric view that humans have complete control over all objects/beings on the planet. Another, and related to this, is the recognition that technical systems are capable of constituting and shaping our experiences/our way of being in the world as human beings. It is this that will be the primary focus on this thesis. That is, the exploration into the foundational ontological structures that occur between humans and computational systems in an attempt to uncover the dynamic and complex, but quotidian, interplay of relationality on the level of Being. It is no longer enough to focus on overarching narratives of Technology or to submit to an instrumental account of technology, when specific technical systems *co-exist* and in so doing challenge the fundamental structures of our existence in an active and independent way. Let me be clear, my use of challenge here is not a critical or negative comment on the nature of technical systems' prevalence in our lives. Rather, I mean that technical systems' mode of Being calls into question the fundamental philosophical categories of subject/object due to the very nature of their relationship with us. It is here perhaps, that we can begin to see the aptness for calling upon Merleau-Ponty's ontology of the flesh as a foundational framework for analysis of the human-technical relations.

Ultimately, I want to posit that Merleau-Ponty's general account of Being in his later ontology allows for us to think through our relationship with technical systems in a way beyond instrumentalism in that it does away with categorical notions of subject/object in perception and experience. The ontology of "flesh", in its generality, appeals to a dynamic account of Being which is characterised by its reversibility and bi-directional becoming. It is as such a vital ontology that makes space for relationality between the body and the world (and vice versa), and is therefore *essentially* tied up with the movement of exchange and inter-constitution. In the end, I will attempt to present "the flesh" as a lens through which to approach the relationship between human subjects and technical systems by illustrating the ontological exchange that takes place within this interaction. In this way Merleau-Ponty's account of Being can open up some crucial questions regarding human-technical relations in that it comes to bear on a complex and dynamic structure of existence in human life, whilst asking fundamental questions about our place in the world when faced with technical systems. It helps to frame the key and underlying questions that drive this paper; On what level of Being does this relation take place? How/ In what way can we understand our relationship with technical systems? What does this mean in terms of living *with* them? Before we can describe the flesh, however, it is important to look back at Merleau-Ponty's phenomenological philosophy, because much of what is crucial in its flesh, was, in its gestational phase, present in *Phenomenology of Perception*.

(II) PERCEPTION & CO-EXISTENCE

A wooden wheel lying on the ground is not, for vision, the same as a wheel bearing weight. A body at rest because no force is being exerted upon it is not, for vision, the same as a body in which opposing forces are being held in equilibrium [...] Vision is already inhabited by a sense that gives it a function in the spectacle of the world in our existence. The pure quale would only be given to us if the world were a spectacle and one's own body a mechanism with which an impartial mind could become acquainted. ***IV. THE PHENOMENAL FIELD (Merleau-Ponty [1945] 1962, 52)***

II.I PERCEPTION

"The blind man's cane" (144) example from *Phenomenology of Perception* is cited often within Merleau-Pontian thinking as a building block to navigate the different perspectives that his account of embodied experience gives rise to. The passage is of consequence within the realms of relational ontology (Küpers 2015), of extended mind theory (Strong 2014), of extended body theory (Hoel & Carusi 2015, Besmer 2015), and of postphenomenology and technology (Brey 2000; Idhe 2002) among others. In terms of its pertinence regarding the question of technology, Kirk Besmer goes so far as to call it the "locus classicus" for beginning to think of technologies as extensions of carnal embodiment (58). As such, we see an already well established conversation surrounding Merleau-Ponty's account of embodiment and perception for our relationship with technology. In particular, we see that the discussion surrounding habit can say something important about how certain technologies extend our perceptual apparatus and coalesce into our being when we interact and ultimately co-exist with them. In light of these latter discussions then, this chapter will look more closely at the blind man's cane example, and the others explored by Merleau-Ponty in *Phenomenology of Perception*, in order to investigate what this means for our relationship with what has been outlined as a "technical system" in chapter one. It will also attempt to uncover how far this example can really take us in terms of mapping out a relational structure between human and technical beings. What do I mean by this? I want to test Merleau-Ponty's notion of perception against our everyday relationship with computational systems. How would a Merleau-Pontian account of relationality between an embodied subject and a laptop or smartphone, for example, look? How does Merleau-Ponty's account of perception measure up to systems that exist as both material objects and as interpretative and active beings in the world? This is what I want to uncover in this chapter.

By undertaking to answer these questions, I hope to make two things clear. First, that Merleau-Ponty's earlier work *does* indeed go far in allowing us to think through our relationship with technology beyond instrumental and representationalist terms, in that it proposes a more complex entwined

relationship with the world of objects and in turn our experience of technical systems. However, and this is my second argument, I want to suggest that the type of embodiment laid out in *Phenomenology of Perception* does not take us far enough in that it cannot account for computational systems as interpretative or active beings. We get stuck when we attempt to use this account beyond anything other than an analysis of a subject's relation to objects in the world. This can perhaps be attributed to the fact that Merleau-Ponty's philosophy *Phenomenology of Perception* necessarily speaks from the subject - as such, I will put forward that we need to turn to a more general and dynamic ontological account in Merleau-Ponty if we are to take seriously the nature of technical systems; that is, the flesh. Firstly, let me begin my introduction the foundational concepts in Merleau-Ponty's philosophy – I start by describing perception.

II.I.i WHAT IS PERCEPTION?

I want to present a few key facets of Merleau-Ponty's account of perception. I want to explore what perception is by elaborating on the notion of the "body schema" and the way in which habit sits centrally within this novel construction of the subject. Moreover, I want to suggest that it is through these facets that Merleau-Ponty's account of perception opens up possibilities for thinking about our relationality with the world in terms of co-existence or communion. I will also briefly draw attention to the backdrop against which Merleau-Ponty builds this account of subjective experience; that is, contra representationalism, empiricist and intellectualist accounts of perception and knowledge, particularly contra Cartesian dualism. As such, to discuss what perception is for Merleau-Ponty is to, on the one hand, recognise a decentring of traditional accounts of sensation, and to also raise up the importance of embodiment as the primary mode of perception. Specifically, I want to show how his thinking challenges the way in which we perceive and sense objects and technical systems, and ultimately how we reach out to them as Beings in the world before us.

II.I.ii The "body schema"

The notion of the "body schema" hinges crucially upon the idea that we are bodies situated in time and space, and in a specific context through which we derive our subjective experience of the

world. Merleau-Ponty stresses that we sense ourselves through "situational spatiality"[8] (102) and posits fundamentally that we are "being(s) towards the world" (183) because the body does not simply exist in space, instead it *inhabits* that space (135). We can understand this as intentionality in the phenomenological sense. As such, Merleau-Ponty's idea of a "body schema" puts forward that the body exists geared towards doing "actual or possible tasks" (102), and through this "I can" intentionality, it senses, organises, and contextualises the relationships between qualities against the background of objective or extended space (103)[9]. We must therefore think of our body as a perceptive Being that presents to us the "already meaningful whole(s)" of qualities in the world (11). Moreover, Merleau-Ponty's situational body is also tied up with a type of double movement inherent in experience - centrally with the idea of reversibility. Touching something comes with the anticipation of also being touched, and yet my hand is more than merely an object in terms of its spatial situation precisely because "it" anticipates this reversibility. Pre-reflective intentionality therefore serves as some kind of synthesis between knowing and sensing on the basis of experienced spatio-temporal existence.

Indeed in Part II of *Phenomenology*, 'The Perceived World' (209-383), this reversibility proceeds as a kind of dialectic with the sensible world. Merleau-Ponty describes that the sensible world "poses to my body a sort of confused problem", to which my body responds by attempting to provide a "means to become determinate" as it grapples to give answers to "a poorly formulated question" (209). This interaction, expressed as a reciprocal back and forth movement of question and answer, has the purpose of presenting our relationship with the world as a "co-existence" or "communion", specifically between the body and what it senses (Merleau-Ponty [1945] 1962, 210). Whilst describing this "communion" with the world through experience, Merleau-Ponty calls upon an analogy of falling asleep to demonstrate how co-existence influences a subject's very mode of existence. He says that;

> "the relations between sentient and sensible are comparable to those between the sleeper and his sleep: sleep arrives when a certain voluntary attitude suddenly receives from the outside the very confirmation that it was expecting [...] A certain respiratory rhythm, desired by me just a moment ago, *becomes my very being*, and sleep intended until then as a signification, *turns itself into a situation*." (219).

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[8] This is elaborated in the chapter "The Spatiality of One's Own Body and Motricity" in Part One of *Phenomenology*. What Merleau-Ponty means by this is that our body, in being contextual and perceptive, exists within the schema of "situational spatiality" - it perceives itself, the objects around it, and the contexts of these relationships. In contrast, objects (that are not "beings towards the world" or intentional) exist within the schema of "positional spatiality".

[9] Husserl's *Gestalt* – sensibles against the background of the objective world giving rise to phenomenal horizons

What this expresses is that our bodies tie us to specific modes of being, through sensation and intention, because it adopts the particular situation with which it is faced.

Turning back then to the nature of perception, Merleau-Ponty builds upon this line of reasoning as he continues; "similarly, I offer my ear or my gaze with the anticipation of sensation, and suddenly the sensible catches my ear or my gaze; I deliver over a part of my body, or even my entire body, to this manner of vibrating and of filling space" (219). To be clear, what Merleau-Ponty means by this is that subjectivity is always and already seated in an embodied intentionality towards the world and its continuous attempt to synthesise itself to/with/through things in the world. For Merleau-Ponty, sensation is actually "nothing other than a certain manner of being in the world that is proposed to us from a point in space, that our body takes up and adopts if it is capable, and *sensation is, literally, a communion*" (219). Intentional experience unfolds as the intricate oscillation between sensing to knowing. It is through this that we come to co-exist or commune with the sensible world and the qualities therein – to sense something is to co-exist with it in that we exist *through* it.

It is crucial to note that this type of subjective intentionality takes place through a pre-reflective/pre-objective inclination towards its own vital/affective situation that cannot be explained through any representational construction. The point here being that the body schema rejects a sole focus on reflective thought as constitutive for subjectivity. It is as such that we can begin to see *how* Merleau-Ponty presents alternative ways of being-in-the-world. That is, through a complex embodied experience of the sensible world over and against the absolutism and static qualities presented in "traditional prejudices" (11). Indeed, this pre-reflective body schema sits at odds with accounts of consciousness and reflection that atomise sensation (31). The particular traditions that Merleau-Ponty works against here are empiricism and intellectualism, as well as representational constructions of space. They disregard any "ambiguity", "shifting", or "haziness" inherent in our perception of a world of objects imbued with contextual situatedness (11; 60), and instead treat of sensation only through "units" or individual qualities perceived (for example, the colour red on its own without recognising its being there as part of a coat or a carpet). This results in what are called "pure" or "absolute" qualities and the misgiving that something like "pure sensing" is possible (Merleau-Ponty [1945] 1962, 5). And so, whilst empiricism and intellectualism put weight behind different aspects of perception (memory projection, attention, judgment etc.), they both fail to account for the complex connectivity of things to the world and that sensations are *always* experienced by us through perception as "*already meaningful wholes"* (11).

In contrast to this, the body schema makes clear that I cannot objectify, categorise, or reflect upon objects without first having experienced them through my vital/affective situatedness which, through my body, constitutes most fundamentally the seat of my subjectivity and my Being. Indeed, Merleau-Ponty says that "I cannot understand the function of the living body except by enacting it

myself, and except insofar as I am a body which rises towards the world" (87). Embodied intentionality presented in this way posits the experience of the world through the "I can" rather than the "I think" (210). One particular example of this pre-reflective "I can" is the acquisition of a habit.

II.I.iii Habit acquisition

When learning a new dance, Merleau-Ponty says that the body often "catches (kapiert) and "understands" the movement" (144). This "catching" of movement takes place outside of what he calls "explicit calculation" (144) . In other words, as our bodies learn particular movements and habituate them, we are *not* caught up in a process of first reflecting on the significance of our movements in their relation to objects and the space around us. In fact, quite contrarily, Merleau-Ponty suggests that habit seems to take place precisely in this pre-reflective engagement with the situation that the body is faced with. If we turn back again to the idea that relationship with the world takes place as a dialogue, then we can perhaps see habit as a fundamental iteration of this conversation. That is, that habituation is a process whereby "the subject does not weld individual movements to individual stimuli, *but rather acquires the power of responding with a certain type of solution to fit a certain form of situation*" (Merleau-Ponty [1945] 1962, 143). To "have" the habit of doing something means that our entire perceptual experience adjusts according to a movement as we absorb it into our manner of being. It is a revelatory example that demonstrates how we respond to certain situations pre-reflectively.

The enmeshment of seeing and being in habituated movement says something fundamental about how we come to know the world. Merleau-Ponty says that habit is "neither a form of knowledge nor an automatic reflex", but "a question of a knowledge *in* our hands, which is *only* given through a *bodily effort* and cannot be translated by an objective designation" (145). Habit is not merely an automatic movement but an active and intentional engagement with the world on the basis of knowledge already acquired by the body over time and, as such, does not *need* to be thought through. Merleau-Ponty describes some examples to reify this point. Giving the example of a woman who wears a feathered hat, Merleau-Ponty says that she; "maintains a safe distance between the feather in her hat and objects that might damage it: she *senses* where the feather is, just as we *sense* where our hand is" (144). Of our spatial motility if we possess the habit of driving a car, Merleau-Ponty states that, "I enter into a lane and see that "I can pass" without comparing the width of the lane to that of the fender, just as I go through a door without comparing the width of the door to that of my body" (144). What both of these examples exhibit is the way in which habit impacts our body schema. That is, that habituated movement, when in interaction with an object or instrument, extends our body schema past the borders of our body so that the object is included within our perceptual sphere or apparatus. The way in which an object

requires our interaction with it demands that we change the way we see and move, and ultimately exist. And in a twofold way, this also comes down to the very way in which subjectivity is constituted in Merleau-Ponty's phenomenal account. In the case of the woman's hat, the feather plays as effective a role as a limb when it comes to sensing the world around her. With driving a car it is as though the person driving's entire body and its perception inflates to the size of the car. Indeed, for Merleau-Ponty "habit expresses the power we have of dilating our being in the world, or of altering our existence through incorporating new instruments" (145). As such, to be in the habit of doing something changes a subject's state of being and extends them into the situation, often extending them into the instrument or object that they interact with.

Regarding the significance of elaborating on what perception is for Merleau-Ponty, we see that it is not just seeing or knowing, it is a way of being - it is exactly a vital *perceptual experience* because it is coloured by our embodied perspective as subjects in a world of complex and reciprocal ontological relations through co-existence. When this co-existence takes place through habitual movements with instruments and objects in the world, we uncover a certain ontological flexibility inherent in the body schema, and that its boundaries are shiftable and extendable. Such a characterisation strengthens the claim that Merleau-Ponty's embodied subject lives in a dynamic and inter-constitutional relationship *with* the world. "With" in the sense that the world too partakes in our sensation of it, it lives around us and we rise toward it; we answer the questions it poses to us as we adopt it into our mode of being. Here it is important to already posit that this "withness" is a key notion that will carry through to my analysis on our relationship with technical systems in the next section - that is, that our communion with computational objects transpires as some kind of technical mode of existence on our part *in an embodied way*. Drawing on the notions of co-existence and habit, I will now discuss how we can use the example of the blind-man and his cane to further the account of extendibility of the body schema into and through computational systems.

II.II. COEXISTENCE

In chapter one, I referred to and defined technical or computational systems as computers, laptops, smartphones - in other words, everyday automated devices that we find ourselves in constant contact with. Computational systems have, according to my understanding of them, two levels of existence. On the one hand, they are material objects in the world, but crucially, they are also interpretative beings due to their algorithmic nature and are as such active beings. Now I ask, in what way am I in a relationship to these devices if we follow a Merleau-Pontian phenomenological description? And, crucially, how far

does such an account take us in taking both facets into consideration? I begin by answering the first question.

II.II.i The blind man and his cane

If we dig deeper and investigate how the relational structure plays out between subject and object or an instrument in habituated movement, we can perhaps begin to see what an extended body schema *means* for the subjective experience of technical systems and in what way we can be in relation to them. I begin by drawing from the example provided by Merleau-Ponty describing a blind man and the cane;

"The blind man's cane *has ceased to be an object for him*, it is no longer perceived for itself; rather, the cane's furthest point is transformed into a sensitive zone, it increases the scope and radius of the act of touching and has become analogous to gaze. In the exploration of objects, the length of the cane does not explicitly intervene nor act as a middle term. The position of objects is given immediately by the scope of the gesture that reaches them and in which, beyond the potential extension of the arm, the radius of action of the cane is included. If I want to become habituated to a cane, I try it out, I touch some objects and, after some time, *I have it in hand: I see which objects are "within reach" or out of reach of my cane*." (144)

As with the previous examples, the blind man's cane also demonstrates clearly that embodied space extends into the instrument that a subject interacts with during habitual movement, but what this excerpt highlights in particular is the experiential process *through which* objects can become incorporated *into* our body schema. When Merleau-Ponty says that the cane "has ceased to be an object" for the blind man, what this means is that the cane has become entwined with his body schema - he faces the world and responds to it through his cane because it is his cane that acts as an informant for sensation, much like your hands or your eyes do. A crucial aspect here is tacticity, or the touching, that takes place between the blind man and the ground. His direct tactile experience is of the cane but it is through the cane that he can "touch" or tactically sense the floor beneath him and the space that surrounds him. This claim, however, needs to be refined because the cane does not simply act as a mediator of experience. Indeed, when Merleau-Ponty says that "the cane does not explicitly intervene nor act as a middle term" (144), what he means to express is the very extendibility of the blind man's being into the cane. This emphasises exactly the *co*-existence or communion that takes place in habituated movement. It is not just that the cane increases the tactical and perceptual reach of the blind man by relaying information about the space around him into his hand - he does not just sense the world through the cane. Rather, the idea is that it *is* in some sense the blind man's hand that touches the ground when he uses the cane. Moving the cane is *part* of the action or gesture of touching and is as such an extension of his body schema into the

world. Crucially, it becomes difficult to pinpoint where the man's being ends and the cane's begins. They are enmeshed into a new body schema and co-exist *together* within his perceptual sphere.

In *Phenomenology of Embodied Organisation* (2015), Küpers argues that this example affords us an understanding of the body schema as something "pliable and malleably extendable" in that it easily assimilates "tools or 'fresh instruments'" into itself (49). Indeed, according to Küpers, the blind man's cane demonstrates that our corporal schema is not fixed and static, but is instead adaptable and ready to incorporate a "myriad of tools and technologies that may be embodied" (50). What is interesting about this claim, and the possibilities presented by the blind man's cane example, is how this ontological pliability can "open[ing] up new configurations of embodiment" (Küpers 2015 , 49). In this sense, we can perhaps already begin to see how co-existence will contribute to a new embodied configuration. That is, it opens up possibilities of embodied configurations that come to include objects and instruments, such as a car or a cane. However, I want to suggest that the idea of a new embodied configuration in this sense is significant when attempting to overcome an instrumentalist account of technology. Indeed, to posit that technologies can be incorporated into our body schema complicates drastically the claim that technology is merely a means to an end. But for now, it is necessary to ask how can Merleau-Ponty's notions of the body schema, perceptual experience, and co-existence help us map out a relational structure between human subjects and technical systems?

II.II.ii technical systems & embodied space

To start, let us look at a device that almost everyone is familiar with, that is a touch screen device, like a mobile/smartphone. Indeed, when I begin to interact with such a device (e.g. I text a friend that my train will arrive at 11:05, I open a music app to begin listening to a playlist, or I make a presentation for an upcoming meeting), a fundamental instance of interaction stems from my intention towards it. As such, and quite inseparable from the intention with which my body rises towards the device, there is the tacticity of the interaction itself. Just as with the example of the blind-man and his cane. Here, I *touch* the screen, or in the case of a laptop or computer the keyboard, and this touching is always and already tied to the meaning of the movement or gesture. It is the capacity to touch an object, or in this case a device, which allows for it to be incorporated into my bodily space. This incorporation, as Ihde points out in *Bodies in Technology* (2005), is facilitated by "the very materiality of technology" (7)

In terms of the significations of my actions, these here are the particular ends fulfilled on the screen - i.e., if I press this button I know that it will open up a new tab or my playlist will begin playing some songs in my headphones - there is a knowledge in the way I move towards these objects. Much in

the same way as when I go to open a door, I do not measure how wide it is to know that I can pass or when I am riding a bike, I know in my body, that exerting a particular amount of pressure on the handlebars will cause me to turn left. Therefore, this point is tied up with intentionality just as much as it is with spatiality and tacticity - they are in fact inseparable. My hand or my finger moves towards the screen with a particular purpose. It is *not* that I need to reflect on where my hand moves to, because if I am used to using this device, my body already knows which area of the screen or which button to move towards. There is as such, just as in our bodies a physical understanding of the space around us, an understanding of the virtual sphere on an embodied level. To be in the habit of texting or navigating a digital environment is to engage with elements of that environment (e.g. keys, tabs, cursors, buttons and symbols, applications, files, etc.) and their locations not as objective places in space but rather to "inscribe around us the variable reach of our intentions and our gestures"(Merleau-Ponty [1945] 1962, 144). That is, to incorporate the dimensions of that system into our body schema through our intentionality towards it.

This kind of extensibility is touched upon by Merleau-Ponty when he says; "The subject who learns to type literally incorporates the space of the keyboard into his bodily space" (145). This is, of course, clear when we discuss typing on a laptop or a mobile phone, but even, in the first instance, seems to hold ground in relation to more nuanced and complex inter-relational spaces like that between our finger and the trackpad, where the space that we navigate and perceive extends *into* the digital world. I know, for example, that when I move my finger across my laptop's trackpad in a certain way, or when I move my wrist as my hand grasps a computer mouse, that the movement of the cursor on the screen correlates to the movement of my hand. And crucially, the cursor is not simply a representation of my movements in a Cartesian sense. Here, it *is* my hand that touches and presses the button on the screen; I "feel" my way through the digital environment by first physically touching the touchpad or mouse with my hand, then seeing the cursor move in accordance with my movements. Like this, I "touch" my way through the digital environment and its various facets. The on-screen cursor serves as the end of the blind-man's cane. Indeed, the screen, the cursor and indeed the entire machine itself are incorporated into the body schema as I become extended *through* these things into the virtual sphere. We can say that the device presents to me a digital environment to which my body responds by incorporating the situation into my being - our vision is taken up fully by the screen and in this sense we can even perhaps say that we take on a technological mode of existence when we interact with technical systems, in much the same way as the subject took on sleep as their mode of being.

There is perhaps a danger to think of our navigating digital spaces as detached somehow from the body. The danger here is a fall back into a kind of experiential dualism perpetuated by the idea that the virtual realm is "intangible", that there is a digital world in contrast to a physical world. But what my

argument suggests is that, phenomenally, we come to experience the digital world in an embodied way. That is not to say that physical, extended, material space can be conflated with digital and virtual space, but rather that our phenomenal experience of the latter stems from our embodied and intentional relationship with technical systems. It is posited on the way in which the subject perceives the world in a Merleau-Pontian sense, that is through embodiment and intentionality. This argument answers the first of the two questions posed at the beginning of this section, I now turn to the second.

II.II.iii technical systems: mediation and co-existence

How *far* can this Merleau-Pontian account of experience take us in terms of mapping out a new relationship with computational systems? In particular, in what way can the philosophy espoused in *Phenomenology of Perception* help us to overcome the "common sense" or instrumental account of technology? I want to put forward that Merleau-Ponty's thinking in *Phenomenology of Perception* presents to us a complex account of our experience of technical systems in such a manner as to fundamentally trouble the general or common sense understanding of technology[10].What I mean by this is that it undermines the idea that technical systems can be still thought of simply as tools. Indeed, it seems that such a description of technology does not take seriously the experiential facets of subjectivity and therefore of the interaction between humans and computational systems as described throughout this chapter. Let me be clear as to the specific experiential facets I am referring to. That is, mediation and co-existence.

In the first instance, using Merleau-Ponty's perceptual account of experience to map out our relationship to computational systems makes it difficult to posit that technical systems act simply as mediators of the digital environment. Indeed, as I explored earlier, the blind man's cane is not for him a middle-term between his hand and the world, but rather is part of his being as it extends into and through the cane in such a way that we can say, experientially, that *he* is touching the ground when he uses it. It is an extension of his perceptual apparatus and of his being because the cane is included within his intentional gesture towards the world. This is the same for a technical system like a smartphone or laptop. The material object with which my hands and fingers engage is not simply a facilitator or middle-point between myself and the digital world. It is true that I need it to enter into the digital world, in the same way the blind man needs his cane to "see" his environment, but due to the way in which

[10] In chapter one, I delineated the notion of the common sense or general understanding of technology in line with Heidegger's critique. That is, that technology is conceived merely as a means to an end, or as a tool used to fulfil human purposes only. I was also clear in stipulating that in this regard, "technology" does not refer to an overarching socio-political force but that I am interested in dealing with specific and quotidian examples of technical systems

subjectivity is built up in this Merleau-Pontian sense, my experience of using a technical system in a habitual way necessarily incorporates it into my mode of existence, into *how* I see the world. As such, the device is an extension of my being, of my perception, and of my experience of the digital world. Its objectivity, that is the metal, plastic, and wiring of a device, becomes a character of the spatiality of my body. My hand reaching from a symbol, a key, or a button becomes integrated into my movements - I know where they are, as I know where my knee or my nose are. Indeed, as Küpers states "instruments [...] cease(ing) to be external to us", meaning ultimately that, "they are becoming, as it were, aspects of our phenomenological body (49-50).

The fact that computational systems are not, in our experience of them, simply mediators significantly complicates the idea that these systems are means to ends. Merleau-Ponty's account of how our subjective experience shifts when we interact with technical systems would posit that, in some sense, "I am this thing, and it is me, when I use it to do things", which is something different both phenomenologically and ontologically from the idea that "I use this thing to do things" - a statement correlating to the instrumental account of technology. They are not simply means we use to have access to the digital world and do work or connect with people, they actually shift our mode of being into the technological when we interact with them (and arguably after we stop using them too). The *way* we exist changes when we interact with computational systems, which is of consequence if we want to rethink the role that these systems have in our lives. This is a considerably more complex account of technical systems than positing that they exist simply to fulfil human ends. Merleau-Ponty's phenomenology is able to show us how this happens in experience by mapping out from its fundament the way in which embodied subjects move through the world. Indeed Idhe and Selinger, in *Merleau-Ponty and Epistemology Engines* (2004), make clear how his phenomenology as an approach to our relationship with technical systems can help to overcome this "common sense" understanding of technology (372). They say that such descriptions transcend both the common sense and dystopian concepts of technologies precisely because they are "*neither mechanical nor external objects"* (373).

Closely connected to this, and in fact it is difficult to really separate these ideas, is the notion of co-existence that Merleau-Ponty's account brings forward. Indeed, the enmeshment, extension, and incorporation of technical systems into human subjective experience all turn on this idea of co-existence. That is, on the dialogue with which we are in with the world as embodied subjects. To say that we are in a communion with computational systems is to recognise them as active participants in our world. Indeed, it presupposes a sensing of them that is characterised by their receptivity to our bodies and to our being. Merleau-Ponty's phenomenology of the body makes space for an active and reciprocal relationship with the world, and in this case with everyday devices like computers, smartphones, gaming systems etc. The significance of such an understanding of technical systems is to raise their status as

objects that simply serve ends, to objects that participate in the dialectic of how we synthesise our experience of the world. It is, of course, in Merleau-Ponty's account not a special status granted to technical systems, but indeed to all objects and to all instruments in the world as it is posited on the grounds of intentional subjectivity. Indeed, it adds another layer of signification to the idea that in our phenomenal relation to them, technical systems unfold as incorporated, dynamic, reciprocal, and in some sense active beings.

If this is what Merleau-Ponty's philosophy can do for complicating our understanding of the relationship to technical systems, it is also important to ask what are its limits? Is this account enough to take seriously all the facets of technical systems as I have described them?

Let's consider my definition again of technical systems. I stated previously that "a technical system is at once an object and something more - a system of processes that *interacts* with the world in which it finds itself through an interpretation of that world." I want to venture that in light of this - Merleau-Ponty's phenomenology does not take us far enough in that it cannot account for both ontological aspects inherent in technical systems. In terms of accounting for a technical system as an object in the world, using *Phenomenology of Perception* allows for us to (1) account for the phenomena of technical systems as material instruments, (2) describe our interaction with these systems as objects in such a way as to take seriously the complexity of the experience we go through when we co-exist with them and take on a technological mode of being . However, this Merleau-Pontian phenomenology falls short in terms of the project of this paper in two key regards. Firstly, it cannot explain the interpretational facet of their existence because this phenomenological account always speaks *from* the subject. It is true that this subjective account of experience is consequential in taking steps to overcome a teleological account of technology, but technical systems cannot transcend their objectivity here. Indeed, in this phenomenal account, computational systems are the same as a cane, or a car, or a feather hat - they have no special status as objects in the world apart from how they appear to us in our experience of them. This is a fundamentally subject-centred account, around which it is difficult to really say something new about these systems as active, interpretative, and constitutive machines. This links crucially to the second shortcoming - that is, that Merleau-Ponty's phenomenology, because it is a perceptual account of human experience, cannot begin to overcome the boundaries between human and non-human actors. It is as a anthropocentric account - admittedly, this is not a fault inherent in Merleau-Ponty's phenomenology as such, but certainly hinders it in terms of its capacity to address the reshaping and rethinking of overarching structures of identity when it comes to human-technical relations. I want to put forward that technical systems, because of their active and interpretative role as meaning makers in the world, are more than extensions of our bodies and more even than objects that respond to us by providing space for a technological mode of existence. I think it is crucial to move away from the subject object division still

so prevalent in this phenomenological account if we are to truly say something about the nature of these systems in our lives on the level of Being. Indeed, it is impossible to consider the ontological nature of our relationship with them as independent and interpretative beings if we only speak from the subject. Technical systems, as I have defined them within the boundaries of computation and algorithmic systems, need be readdressed on an ontological level - as active beings that not only take part in our experience of the world, but that "from the outside" of subjectivity constitute, shape, and enmesh themselves with us. To do this, and to really try to map how we can live with them, we need to turn to a more general ontological account of relationality. For this, and where I believe Merleau-Ponty really begins to become a vital thinker in terms of technology, I want to turn to the ontology of "the flesh".

(III) ONTOLOGY

What has so far been addressed in this thesis, is Merleau-Ponty's phenomenological account of the body, of perceptual experience, and of a kind of co-existence or what he calls "communion with things in the world" (45). These aspects, all inseparable, and ultimately targeted against representational and empiricist accounts of knowledge and perception, tie together to form a path breaking and radical account of subjectivity. However, at the end of the last chapter, I described that this philosophy, espoused primarily in *Phenomenology of Perception,* is limited through its reliance on a subject-object dichotomy and a fundamentally subject-centred account of perception. I concluded the previous section by outlining why this is problematic for rethinking and reshaping the way in which we view our relationship with algorithmic and computational systems, particularly its inability to take seriously the role they play as active and interpretative beings; that is, how they constitute and shape us. Hence, I believe that it is in Merleau-Ponty's later, and partly incomplete, works that we can find his most original and valuable contribution for mapping out a relationality with technical systems; that is, through an exploration of his ontological notion of "the flesh". Although Merleau-Ponty never discusses at length the notion of technology in his works, there is, I believe, a critical aspect to his philosophy and indeed to the flesh that can help us better navigate human-technical relations. It was, nonetheless, crucial to first deal with Merleau-Ponty's earlier ideas because much of what sits at the fundament of the flesh was, in its gestational phase, already present in *Phenomenology of Perception*. As we will see, the notion of coexistence and perception still hang together centrally in the flesh and instead of being rejected by Merleau-Ponty, is reworked into a more general and yet more nuanced sense. I posit throughout this chapter that what makes the flesh a ground-breaking ontology for thinking through our relationship with algorithmic systems is that it "does not fit into established ontological categories and marks a break with dualist metaphysics" (Hoel & Carusi 2018, 78). Given that the flesh is neither substance nor consciousness and acts instead as that binding and formative middle ground of interaction between corporeal beings, it "offers us all at once, pell-mell, both "subject" and "object", both existence and essence" (Merleau-Ponty [1968] 2000, 130). It is as such, I suggest that the flesh is a fruitful ground for rethinking the *dynamic and constitutive* interaction between humans and computational systems in that it transcends subject-object dichotomies and opens up potentiality for new ways of structuring relationships between beings. This, crucially, centres upon the potential that the flesh bears in terms of opening up relational ontology beyond an anthropocentric account, one that can challenge "preconceived dualism between bodies and environments, humans and nonhumans" (Hoel & Carusi 2017, 48).

Going forward then, I ask the reader to recall the driving question behind this project; How can we make use of Merleau-Ponty's notion of the 'flesh' to explore the ontological grounds of relationality

between humans and technical systems? And crucially, how is this important for rethinking how *we live with* these beings? In what follows, I will first briefly outline the core tenets of the flesh as described by Merleau-Ponty in *The Visible and The Invisible*, particularly from the chapter 'The Intertwining - The Chiasm' and some notes from later lectures concerning nature. After unpacking this account, one which is characterised by its reversibility, productive negativity, and generality, I will make an attempt to show the ways in which the flesh overcomes finally the objectification and instrumentalisation of technical systems. My first argument is that the flesh can account for an ontological plurality of being which means we can talk about existing *with* these systems. I will discuss this through the position that Merleau-Ponty describes as "intercorporeity" (136) as well as delve into what this means for living in an ontological "interworld" of bi-directional constitution (Merleau-Ponty [1968] 2000, 141). My second argument, and leading on from this previous point, is that the flesh opens up ways to talk about how technical systems are able to constitute and influence our style of interrogating the world. I will attempt to show that this displaces any conception of them as merely tools or extensions of the body, but inversely, that they come to inform the way in which we are geared towards the world through the symbolic structures they inscribe in our bodies. The final point centres around the generality of the flesh. I posit that the generality of Merleau-Ponty's ontology marks a potential for shifting away from subject-centred and therefore anthropocentric ontologies. It is, therefore, able to open up conversations about way in which beings interact without their having to fit into traditional schemata of embodiment or of subjectivity. These three points, that is, of "intercorporeity", of interrogation, and finally of the generality of the flesh work to open up philosophical grounds for describing technical systems as active and participatory Beings. That is, as beings that are active, interpretative, and constitutive of human experience, not merely as tools or instruments in a teleological or causal construction. Ultimately, my attempt here serves to answer the overarching research question through a troubling of the deeply entrenched subject-object dichotomy precisely by drawing attention to the idea that these beings cannot be thought of as a subject but not either as simply as object. The ultimate turn towards the flesh's ontology is also a call to take seriously that new philosophies and ways of thinking need to be developed, in complexity and in generality, so that we may make space for nonhuman actors in the world. Towards the end of this chapter and then in the concluding remarks of this thesis, I hope to allude to the importance of Merleau-Ponty's thinking for this domain, but more pointedly, that we can go beyond him still to continue to open up ways of dealing with algorithmic and computational systems. It is here where I will suggest an answer to the question; how and why is Merleau-Ponty's philosophy important for rethinking how we live with these systems?

III.I. HOW CAN WE THINK OF THE FLESH?

It is crucial to first understand what the flesh is in Merleau-Ponty's thinking and why it is such a ground-breaking departure from his previous works.

Merleau-Ponty describes the flesh as "an element of Being" (139). What he means by this is that we can think of it, "in the sense of a general thing, midway between the spatio-temporal individual and the idea, a sort of incarnate principle that brings a style of being wherever there is a fragment of being" (139). Already, there is much to unpack here. Let me begin by drawing attention to three key aspects of this "indirect" ontological structure. It is already worth noting that whilst I have isolated "three key aspects", each of these facets of Merleau-Ponty's ontology intertwine and wrap into and through one another in such a way that makes their unfolding inseparable. I describe them separately for explanatory purposes, but more importantly, because these particular characteristics of the flesh are, as I hope to demonstrate, crucial for the project of redefining human-technical relations. Indeed, the three features of the flesh I will now describe are; (1) the flesh as a mediating principle, (2) the flesh as a "style of being", and finally (3) the flesh as a general ontology. Let me begin by describing what is meant by the first aspect; that of mediation.

III.I.i The flesh as a mediating principle of Being

In terms of understanding the flesh as a mediating principle of Being, it is important first to understand the way in which Merleau-Ponty describes the visible and invisible. Indeed, it is already worth noting that the ontology of the flesh still, as with the concerns of *Phenomenology of Perception*, centres around the role that vision and perceiving play in constituting our relationship to the world. Only here we see these aspects play out within a more fundamental and overarching structure of embodied beings in general. As such, the visible and the invisible are inseparably entwined and appear to the seer through the gaze or the look; the visible occurring between the corporeal body and the visible world, and manifesting as a concretion or interweaving of *qualia* and their contexts. Indeed, these *qualia* become visible and are revealed in relation to and through their specific forms, whether that be "a certain woolly, metallic, or porous configuration or texture" (132). Often using the example of redness to exemplify a specific *quale*, Merleau-Ponty demonstrates already the intricate relationship between *qualia* and their various presentations in the world. The redness of a dress is always, and perhaps more consequentially, tied up with the texture and configuration of the fabric of which it is made; "the colour is yet a variant in another dimension of variation, that of its relations to its surroundings" (Merleau-Ponty [1964] 2000, 132). What is important is that the visible is not "without thickness" (131). It is not merely a sum of or

collection of all the various *qualia* accessible to vision, it is that which sits between these qualities and connects them with one another and connects the seer to the world. Indeed, it is what Merleau-Ponty notes as, "the connective tissue of exterior and interior horizons" (132). It is in this sense that the visible is utterly inseparable from the invisible.

The visible, or what we can refer to as the sensible flesh, "sublimates" into an intertwined level of invisible being; a conceptual flesh or "the universe of ideas" (Merleau-Ponty [1968] 2000,149). Once again using the example of a red dress, Merleau-Ponty demonstrates the intricacy of the relationship between the visible and the invisible for his ontology of "a flesh of things" (133). He says that "the red dress a fortiori holds with all its fibres onto the fabric of the visible, and thereby onto the fabric of the invisible" (132). Its redness is sunk into and connected with the essence of redness. The invisible are all the connotations, images, notions, memories, historical references, in other words every idea, that connects to red as a visible. The visible world is pregnant with invisible meaning. Merleau-Ponty makes this clear when he says;

> We do not see, do not hear the ideas, and not even with the mind's eye or with the third ear; and yet they are there, behind the sounds or between them, behind the lights or between them, recognisable through their always special, always unique manner of entrenching themselves behind them [...] It is therefore not a *de facto* invisible, like an object hidden behind another, and not an absolute invisible which would have nothing to do with the visible. Rather it is the invisible of this world, that which inhabits this world, sustains it, and renders it visible, its own interior possibility, the Being of this being." (151)

The invisible then can be thought of as a kind of interior horizon to the visible, or an absence which lines the gaze of the sensible world with idea and meaning. It is as such that "a visible" is offered up to vision not as "a hard chunk of indivisible meaning" or as "all naked", but always from within an intricate and dynamic intertwining with and through the invisible (Merleau-Ponty [1968] 2000, 132). Merleau-Ponty says that "between the alleged colours and visible, we would find anew the tissue that lines then, sustains them, nourishes them, and which for its part is not a thing, but a possibility, a latency, and a flesh of things" (33). Indeed, the flesh envelops the gaze through this movement between the visible within the invisible, and vice versa. A few things become important here.

In the first instance, we can begin to perhaps understand what is meant by the flesh as a mediating principle. That is, as the "milieu" of relationality between the body and the world, and between the sensible world and the world of ideas. Indeed, the body is at once enmeshed in fleshly relations with things in the world, and is itself an instantiation of in the intertwining of its own phenomenal and objective facets (Merleau-Ponty [1968] 2000, 138). This idea of "milieu" is of

consequence if we think of the flesh in its different senses as a "middle", a "medium", or an "environment" that, depending on the specific context of the relationship is able to serve as an "operative, organising force" between the body and the world (Hoel & Carusi 2015, 78). Hoel & Carusi, in their *Thinking Technology with Merleau-Ponty* (2015), posit that this mediating notion inherent in "milieu" was important for Merleau-Ponty in that it described the way in which "each mediated situation opens a new dimension of the world, a specific "environment" with its own range of possible appearances and actions" (78). This insight however, and this is the second point of note here, centrally hangs on grasping the flesh as a principle that deals with lived being. It is important to recognise the relationship between the visible and the invisible not in terms of a merely ideational or conceptual relationship, but as a relationship between embodied and lived beings that is vital and dynamic. Indeed, "living being (…) never moves in an abstract universal space but in a lived, concretised and dimensioned world. It always moves in the middle of things, rooted in the presently available reversibilities of flesh. Further, even if it is 'specified', the opening is never fixed but variable" (Hoel & Carusi 2018, 56). And so, to think of the flesh as a mediating principle is to understand it as that way in which living being exists *in the middle of the world, through and by it*. The world and the body are enmeshed and are not separate categories of being – the flesh serves at that medium through which they constitute one each other, always in the context of the other. Indeed, to think of the flesh as mediating principle to recognise Being as the negotiation between my body and the world, and crucially in Merleau-Ponty, it is this very dynamic that takes precedence. Indeed, Hoel and Carusi clarify this by stating that, "flesh does not mediate between pre-existent and independently constituted entities; rather, it is in and through mediation that entities are interrelated and become the entities they are. The mediation of flesh, in other words, is productive and formative; it has ontological consequences" (78).

What I have so far described is the way in which we can think of the flesh as a mediating principle in terms of its being a "milieu". However, I have also already described the flesh as a potentiality or latency of Being expressed through the invisible. This becomes important if we want to look at the particular *way of* being that the flesh opens up, or in other words, *a style of being.* Indeed, it is important to note that already, from the outset, the construction of the flesh posits an ontological position that uncloaks the parts and the whole of meaning in a simultaneous movement. That is, through a dialectic movement between positivity and negativity in Being - here Merleau-Ponty is situating himself alongside Sartre's notion of the In-Itself versus the For-Itself (indeed an entire chapter of *The Visible and The Invisible* is dedicated to overcoming and reworking the notion of nothingness central to Sartre's philosophy). And whilst this conversation goes beyond the scope of this thesis, the dialectic facets of Merleau-Ponty's flesh cannot be ignored. In fact, the notion of interrogation sits centrally within the way in which the flesh unfolds; it is this that can perhaps be seen as the style of flesh. The "how" of the way

it is a liminal or mediating element of Being. It is also unavoidable in terms of dealing with the forthcoming arguments regarding the potential of the flesh for thinking through our relationship with algorithmic systems. I want already to suggest that our relationship with technical systems can be thought through the flesh in terms of style, in terms of how we connect and communicate with them. It will ultimately be a question of *how* we co-exist with these beings that will be of consequence.

III.I.ii Interrogation: the flesh as a "style of being"

I now want to explore how we can think of the flesh as a style of Being and ultimately why this is crucial for the project of describing the ontological relationship between humans and nonhuman technical systems.

Singer puts forward that style, for Merleau-Ponty is, "in its most comprehensive sense (…) a generalised structure of being-in-the-world, a fundamental component of all phases of existence", and moreover that it is, "that persistent and characteristic *manner* of appearance that we recognise in things and other people" (1981, 154). I want to suggest that the style of the flesh, or its "manner of appearance" as that "generalised structure of being-in-the-world" is as an interrogation between the body and the world. We know that interrogation is not a novel aspect in Merleau-Ponty's philosophy. In fact, as I have explored in previous chapters, the way in which Merleau-Ponty posits the body's relationship with the world is inherently interrogative. To recapitulate; in *Phenomenology* the world "poses to my body a sort of confused problem", to which my body responds by attempting to provide a "means to become determinate" as it grapples to give answers to "a poorly formulated question" (Merleau-Ponty [1945] 1962, 209). I have previously described this as a dialogue between the body and the world, and we see that in his later thinking surrounding ontology, this dialogue is not abandoned but reworked into what can be thought of as a dialectic in the flesh between the visible and the invisible.

In his account of the flesh, Merleau-Ponty's project to develop philosophical interrogation plays out through the movements of divergence and differentiation (*écart*). This interrogation between the body and the things is ultimately made up of a dynamic oscillation between the "two leaves of the body", between the sensible body and the sentient body, or "the sensible sentient" (Merleau-Ponty [1964] 2000, 136). In terms of style, for Merleau-Ponty, to be in the world as a sensible sentient *is* to be in an interrogative dialectic with a multitude of different levels of Being simultaneously. This is how we can understand the flesh, and it is *through* the flesh as the middle term between beings, whose style is constituted by overlapping interrogative dimensions (touching/touched, hearing/heard, seeing/seen measuring/measured), that corporeal Beings come to be what they are. It is, as such, a fundamentally processual ontology; the focus here is on this movement of differentiation. But how does this style play

out in the flesh? I want to suggest that this interrogative process can be thought of as potentiality of Being and as "productive negativity". Let me the example of two hands touching one another to make this clear.

Indeed, for Merleau-Ponty, the flesh should not be thought of as simply seeing or looking, but can become instantiated in an array of ways of being. He refers explicitly to touching and hearing in *The Visible and The Invisible*. Indeed, "the visible spectacle belongs to the touch neither more nor less than to the "tactile qualities" (Merleau-Ponty [1964] 2000, 134). The structure of the flesh encompasses the entire range of corporeal perception, and all these styles of exploring the world too come together to form the whole of Being. The, now famous, example of the interrogative process between my two hands exemplifies well the intertwining chiasmic movement between the sensible and the sentient inherent in the flesh. What Merleau-Ponty calls "a veritable touching of the touch" takes place when my right hand touches my left hand. My right hand, in the process of exploring tactilely or "palpating", touches the left hand, and as it does so, the left then "descends into the things" (Merleau-Ponty [1964] 2000, 134). It describes the moment when my left hand, a sentient and "touching subject" passes into the realm of the sensible, into the dimension of the visible, as a thing. At any moment, there is a shift between these two hands and the process of passing into the realm of things switches, the interrogative movement between the, in the one second, sentient, and then sensible in the other. This demonstrates the doubling over of the body or its continuous oscillation between touched and touching. But the touched hand is never really simply an object, this touching is *always* tied up with the chiasmic movement of being touched - it demonstrates a fundamental reversibility which sits at the core of the dynamic inherent to the flesh. The relationship the toucher has with the world in this example also serves to demonstrate the idea that this experience does not take place on a positive spectrum of being, but instead in terms of what Hoel and Carusi term a "productive negativity" in that the touching always suggests a being touched, it is "that which is not now realised but will or can be" (55). It describes the potentiality and possibilities of the flesh that sit within the differentiation and absence of Being itself. This example therefore serves to go beyond merely illustrating the touching/touched reversibility but spills over into exposing the divergent structure of the flesh as such. In particular, we can say that relationality of the flesh unfolds as "a pattern of negations, a system of oppositions" (Merleau-Ponty [1995] 2003, 238), which ultimately works to show that embodied Being is capable of opening up upon the world and opening up new dimensions through this interrogation that "displace the horizons of the established" (Merleau-Ponty [1964] 2000, 56).

III.I.iii The "flesh" of technical systems: "interworld" and co-constitution

Having discussed the two facets of the flesh as a mediating principle and as a style of Being, I want now to discuss how these characteristics are consequential for thinking through our relationship with algorithmic systems, before turning to the final aspect of the flesh as a general ontology. I group these two qualities together, because as I previously mentioned, they are so interwoven within Merleau-Ponty's thinking that it becomes difficult to isolate each aspect without atomising the flesh and rendering an inherently dynamic ontology static. Moreover, their impacts on how we deal with algorithmic systems as active beings intertwine – that is, the notion of mediation and of interrogation in the flesh both simultaneously work to redefine human-technical relations in much the same way. I ask then, in what ways does the flesh do this? I will suggest that it opens up the possibility of "an interworld" or a shared world, and that the interrogative nature of the flesh posits a bi-directional constitution between human beings and technical systems. These are both crucial steps in furthering an account of relationality beyond what was possible in *Phenomenology of Perception*, in that they work to make space for computational systems as active and constitutive beings.

It is in the first instance crucial to note the way in which both the 'milieu' of the flesh and its interrogative style relate the body to the world. Indeed, the flesh allows for Merleau-Ponty to talk about a certain kinship or unity that the body has to the world and to things. The flesh binds the body to the world and the world to the body in such a way that their being cannot be split up into two separate compounds or substances; on the one hand conscious, reflective, sentient existence and on the other, visible, tangible, objective, extended existence. The flesh posits a shared world on the basis of corporeal or embodied being. It allows for us to escape a solipsistic construction and live *in* a world because it recognises that we are fundamentally *of* it. Indeed, the tactile world opens up to my body and through my exploration of it as both sentient and sensible being, I discover that I am wrapped up in it and it is wrapped up into me. The relationship between the body and the world cannot be thought of as, on the one side, subjects, and on the other side, objects. If the body is able to see and touch the world it is because it too is *of* the world, it is a sensible being *with* the things as well as a sentient being of them. Of this Merleau-Ponty says;

"It cannot be by incomprehensible accident that the body has this double reference; it teaches us that each calls for the other [...] If it touches them (things/objects) and sees them, this is only because, being of their family, itself visible and tangible, it uses its own being as a means to participate in theirs, because each of the two beings is an archetype for the other, because the body belongs to the order of the things as the world is universal flesh" (137)

Indeed, in this context the type of interrogation inherent to the flesh is characterised as a participation and posits corporeal being, in the exploration of its environment, as "the instantiation of the flesh as [a] formative medium" (Hoel and Carusi 2018, 57). But is it through this medium that Merleau-Ponty is able to advance the idea of an "intercorporeity" (140), that crucially presents the possibility that we can, through the generality of Being, acknowledge "that there are other landscapes besides my own" (Merleau-Ponty [1964] 2000, 141). Indeed, the way in which Merleau-Ponty describes the flesh puts at the forefront the position that a shared world with other beings is possible. This is now where I turn to technical systems.

I have defined technical systems as, on the one hand, possessing a material or objective body, but also that they are, in the second instance, always tied up with ongoing and interpretative processes in response to their interaction with us and with their environment. This second facet, that makes up an important part of computational systems mode of being, makes it very difficult to relegate them to the realm of objects. Even other tools as I have described in previous chapters like the blind man's cane, a car, or a tool like a hammer or a pen, do not have what is ultimately an independent and fundamentally autonomous aspect to their existence. Technical systems reach out to their environment, they respond to it, they go through processes of "automated reasoning", and draw certain conclusions upon dealing with their surroundings. If we are to use the flesh to understand our relationship with them, it is this evasive and dynamic aspect of technical systems that need be addressed. Hoel and Carusi state how the ontology of the flesh describes that "the body schema is not just a relation to space and to things, but essentially a relation to other body schemas too, making every 'world' always already an 'interworld' shared with others (56). What is of note here is this "relation to other body schemas too". Indeed, the previous chapter described the way in which our body world gets extended into digital or virtual space once it is in the habit of engaging with technologies like computers or smartphones, but there we were unable to move past the subject-object dichotomy inherent in that phenomenological description; ultimately hampering it in a more complex but still finally instrumental account of our relationship with these systems. To move past this, I posit that in our interaction with technical systems we are in a bi-directional, or dialectic interrogative relationship with them. How is this? And why is this consequential?

If we look back again at the example of the touching and the touched that Merleau-Ponty uses as an expression of the flesh we can perhaps get some clarity on this. Indeed, what happens, according to this ontology, when my hand reaches out to the screen of my smartphone? Here my hand is sensed in the same movement that it senses, this sensing is not limited to the tactile connotation but to the type of interrogative process described earlier. My hand extends into the digital environment, and now it is no longer a matter of extension into a different kind of embodied space as a subject, but as corporeal being that, on the basis of the most general principle of Being, faces another being and is just as shaped by the

type of environment it inscribes in my body just as I shape it. This other, sensing and interrogative, "body" , this computational system, instantiates in my body an already "natural symbolism" of Being. What I mean by this, and what sits in line with Hoel and Carusi, is that there is a certain "logos of perception [...] which is tacit but fully operative in living beings of all kinds" (2018, 79). My body schema opens up and is interlaced with that of technical systems because they are, as Merleau-Ponty puts it "made of the same stuff" ([1995] 2003, 224). Indeed, the kind of bi-directional constitution implies some crucial insights for human-technical relationality.

The flesh allows for us to talk about technical systems as beings that inform us, shape us, and constitute us, and therefore moves past the objectivity present still in *Phenomenology of Perception*. But *how* does this happen? Indeed, when my hand explores the surface of the screen it is not simply a tactile exploration; the touching is simply one single instantiation of being in the flesh, there is also an opening up of Being upon this technological layer of symbolic meaning that sits between and within the visible dimension of this interaction. Indeed, this "technical body", is woven through and saturated with invisible meaning. This all turns upon the power that the body has to project itself into the world through "symbolic expression - not despite but through the thickness of sensibility" (Damasso 2019, 82). In other words, this mediating principle between beings that is the flesh posits a certain distribution of the interrogative processes that takes place in the body. There is a shift away from the subject-centred construction of relationality and instead grants other bodies, and their "landscapes" a relative agency in constituting the style in which my body reaches out and expresses itself. This hangs upon the body schema's capacity to be modified and transformed through its ability to train and learn new skills (Hoel and Carusi 2018, 56), or what Küpers calls the body's propensity to be "ontologically pliable" (2015, 49). If this holds true for the way in which the body incorporates new symbolisms and tools, "each with their own 'nonhuman' mode of operation" (Hoel & Carusi 2018, 56), then is too holds for technical systems. That is, that we enter into a bi-directional and co-constitutive relationship with technical systems given that they (1) interpret us when we are in contact with them, and (2) that they provide the body with a particular technological symbolism or style of interrogation. This once again reifies the implicit nature of what it is to share a world with other bodies in this bi-directional ontology proposed by Merleau-Ponty, that is, through "a site of reciprocity and mutual responsiveness where perceivers and environments shape and co-constitute one another" (Hoel and Carusi 2018, 50). With such an understanding, we can account for technical systems past their instrumentality and their objectivity. Indeed, relationality with algorithmic systems thought through the lens of the flesh, means that we finally posit the active and interpretative facets of their existence on the basis of this shared and distributed interrogative interaction. The ontology of the flesh not only has the capacity to raise their status out of objectivity, but can also positively assert their status as Beings in this world that face us as

fundamentally interrogative, interpretive, and constitutional; in short as active beings. It is in the flesh, not just a matter of different degrees of Being, but a matter of different *ways* of or *styles* of Being. Indeed, this inherent opening up of the body and the intricate and inseparable relationship between the visible and the invisible present the opportunity for our relationship with technical systems to take place within a very specific "technoscientific" level of interrogation (Hoel & Carusi 2018, 48). It is as such that the flesh provides grounds whereupon we can describe a relationship with technical systems that is not limited to tactical and physical interactions, or to just abstractions surrounding "the invisible" interactions inherent to algorithmic processing.

There is one fundamental objection that can be raised to all I have said concerning technical systems and the flesh. That is, that Merleau-Ponty, when describing intercorporeal being, explicitly refers to living and organic organisms. This is made particularly clear in his later notes concerning *Nature* ([1995] 2003). The generality of the flesh is, in this sense, a principle we can use to describe the way in which biological beings orient and situate themselves, in short how they interrogate the world and the chiasmic and intertwining relationality between their bodies and their environments, as well as between other living Beings. Indeed, the mechanic and symbolic relationship between humans and technical systems does not fit this configuration. How can we say that technical systems have "bodies" in the sense that Merleau-Ponty means when he refers to corporeal Being? I here refer again to the "carnal communicability" previously referred to and the capacity that the body has of incorporating "new tools and symbolisms" into the "logos of perception" (Hoel & Carusi 2018, 62;56;51).

In the first sense, technical systems as I have defined them are, material and objective things in the world – they too have objective bodies that we reach out to and which work to show us that we are "made of the same stuff" (Merleau-Ponty [1968] 2000, 138). However, given that they also have an inherently interpretative and algorithmic facet, they too have within themselves their own respective "landscapes" and manner/style of interrogation. Hoel & Carusi expand Merleau-Ponty's flesh to encompass a notion called "the measuring body" (2018, 47-64). They situate the measuring body within a circuit of seeing and being seen, knowing and being known (etc.), and describe that this circuit is always and already *mediated* through interrelated and co-constitutive *modalities* (Hoel & Carusi 2015, 81). Indeed, the circuit, or what I described as a mediating principle, "is not one unitary circuit of one modality", for Hoel & Carusi, the measuring body is a "shifting matrix that is at once perceptual, symbolic, and technological" (2015, 81). What they mean by this is that, in human bodies, the "circuit" is always open and already "inflected" by "artificial symbolisms" (2015, 81). If we understand the algorithmic and interpretative aspect of technical systems' definition, we can perhaps align this with what Hoel and Carusi call "artificial symbolisms" to the extent that a "symbolism" in their understanding enters the circuit as a modality of language or art for example. That is, as a style or type of embodied

expression. As such, “artificial symbolisms and technologies, in other words, are understood to have the power to transform the body’s organising logic and hence its relationship to its environment.” (Hoel & Carusi 2015, 81). In terms to broaching the counterargument, we can say that technical systems are “bodies” in so far as they interact with us as sensibles, but moreover that they are constitutive and active to the extent that they change the way in which the body organises itself. In the flesh this can be understood as a particular technological dimension. More crucially, however, what Hoel and Carusi show us, is the potential the flesh has to go past itself and to begin to incorporate nonhuman and non-living Beings. Indeed, Merleau-Ponty could not anticipate the complexity and enmeshment of algorithmic systems and their impact on our lives. But, to take the flesh as a style of Being and as a mediating principle in its absolute generality is to open up possibilities of using his thinking for future issues, including addressing new active agents in the world.

What I have attempted to show here is that technical systems are active and interpretative beings in that they constitute us on a fundamentally ontological level. In terms of answering the overarching research question, we can now posit that Merleau-Ponty’s ontology of the flesh helps us to rethink our relationship with these systems by providing grounds for their Being that sits at odds with their existence as mere objects in the world. We see that the flesh has the potential to raise up these systems and describe ontologically how they shape us and as well as how we shape them. Moreover, it takes steps in overcoming the objectivity of computational systems still so prevalent in the previous chapter. That is because these systems cannot be thought of as tools or instruments, and not only because of the way in which subjectivity is constituted, but because we can think of them as influencing the mode of our body’s being. We can say that we get feedback from them, they push back against our being with their own and in that sense they are active. More radically perhaps, it works to show that there is “a carnal communicability in [embodied beings’] behaviours” that this is translatable between human body schemas and technical systems (Hoel & Carusi 2018, 56). This insight, and much of what I have said so far, also pivots upon the final and important facet of the flesh; that is, its generality as an ontology. I will now briefly explore this in relation to reshaping views on the ontological relationality between human beings and technical systems.

III.I.iv The flesh as a general ontology

Until this point, I have characterised the flesh as an ontological relationality between a body and the world, between touching hands and seeing eyes. This could imply a subjective ontology or subject-object binary relation. But I want to emphasise that this is not the case. In fact, we see Merleau-Ponty take distance from this position wherein he describes the flesh not as ontology that refers not to subjects

and objects but to the archetype of "carnal being" (136). Indeed, this philosophical project is *not*, for Merleau-Ponty, an anthropological investigation of Being (136). Instead, the ontological structure of the flesh intentionally includes all sensible sentient, corporeal Beings because this generality "constitutes the unity [of the body]" (142). The body brings us into relation with the world through communicating and coexisting with things in and through their depths, such a relationship is "inaccessible to a subject that would survey them from above (Merleau-Ponty [1964] 2000, 136). It is as such that the flesh is a "prototype of Being" (Merleau-Ponty [1964] 2000, 136). One which unfolds in the negotiation between corporeal being and the things, between the visible and the invisible, and as latency or as the "presentation of a certain absence" (136). It is through this general configuration of being that Merleau-Ponty can eschew the conventional structures of a subject-object ontology. This, however, has important implications for which bodies count as co-existing and constituting one another and opens up the potential to begin to move past not only a subject-centred worldview but a human-centred construction of a lived world. Merleau Ponty asks; "Now why would this generality, which constitutes the unity of my body, not open it to other bodies? [...] Why would not the synergy exist *among* different organisms, if it is possible within each?" (142).

Indeed, the bi-directional constitutive relationship that the body has with the world combined with the recognition that we are already of it challenges outright preconceived dualisms between the body and its environment (Hoel and Carusi 2015, 47-48). It explicates clearly that corporeal or embodied being is expressive "in the sense that there is a carnal communicability between behaviours" – a general and universal communicability between beings. I argue that it is this final aspect that truly sets Merleau-Ponty's thinking apart. In particular, it can at last, in its generality, overcome the fundamentally dualistic construction of representationalist and intellectualist philosophies and the still fixed subject-object ontology left over from previous works. The flesh is that collective and "formative medium" of subject and object and as such works to overcome the dichotomy (Hoel & Carusi , 60). As I have already said, it is an ontology that actively works against solipsistic constructions and can really say that we share the world with others, other humans, other animals, other sentient sensible bodies. Indeed, the general nature of the flesh as a tool for looking at our relationship with technical systems, "acknowledges that technoscientific interrogations of the world involve distributed and displaced agencies of observation that engage in a two- way formative exchange between observer and observed – challenging preconceived dualisms between bodies and environments, humans and nonhumans. (Hoel & Carusi 2018, 48).

To be clear, because of the general nature of the flesh as an ontological structure, we can think of the relationship between human beings and technical systems in such a way as to transcend the subject-object dichotomy. Indeed, as I have previously posited, technical systems through their very

nature already throw into crisis this binary and as such call for a more general and also more nuanced configuration to take into account the two facets of their being. That is, on the one hand material objects, and on the other, as interpretative and active beings. I believe that it is through Merleau-Ponty's notion of the flesh that we can truly map out the dynamic ontological relationship between human bodies and computational systems. Moreover, it also demonstrates Merleau-Ponty's pertinence as a philosopher of technology, and indeed a philosopher of many different fields, due to the unity and unanimity of his later, ontologically centred, thinking.

Conclusively, and what I have attempted to demonstrate throughout this chapter, his late philosophy allows for us to actively posit computational systems' role in the world on the basis of an active and inter-participatory relationship with humans given the general interrogative and symbolic structure between corporal beings that the flesh espouses. More specifically, the flesh, seen as that binding and interweaving structure, presents the possibility for us to talk about our relationship with computational systems on the grounds that we share the world with them, and too are of them in some sense. To be clear, we can think of technical systems as active, interpretative, and constitutive beings and in this way it accommodates for the second facet of their existence that I delineated in the first chapter.

(V) CONCLUSION

This thesis has asked the question; How can we make use of Merleau-Ponty's notion of the 'flesh' to explore the ontological grounds of relationality *between* humans and technical systems? In order to answer this, several important steps were taken.

Firstly, it was important to delineate and contextualise the issue of technology within philosophy, particularly in the twentieth century and against figures like Ellul, Mumford, and Heidegger. This helped to, on the one hand, introduce some of the core issues surrounding philosophy of technology, whilst also allowing me to narrow in on and finally define the term technical systems as it was referred to throughout the thesis. That is, as "they are machines and devices, material and tangible. On the other hand, their existence takes place also at the level of interpretation. That is to say, that a technical system is at once an object and something more - a system of processes that *interacts* with the world in which it finds itself through an interpretation of that world". It is this "something more" is what sits at the heart of this thesis, and the attempt to formulate and define the philosophical grounds through which we can account for such a complex and nuanced Being. It is through Merleau-Ponty's thinking that I have attempted to map out a relationality between human beings and technical systems defined as such.

The second chapters worked together to build up a phenomenological analysis of technical systems by asking what is perception for Merleau-Ponty? and then, how far does this perceptual account of experience take us in mapping out a relational structure between humans and computational systems? I suggested here that, a phenomenological account as that espoused in *Phenomenology of Perception* takes us so far as to complicate the instrumentalist and representationalist accounts of technology in that it allows for us to describe them in terms of embodied extension due to the co-existent and communal structure of perception. That is, that causal and teleological constructions become irrelevant as soon as we recognise that our subjective configuration of experience pivots on intentionality and places the body schema always and already into a dialogue with the world. For technical systems, this means that not only do these technologies becomes incorporated into our bodily space (which opens up potentialities for talking about digital space as being embodied), it also shifts my very mode of being as a subject into what can perhaps be thought of as a technological mode of Being. However, the described that the limitations of this account, even though it made progress over and against the "everyday" conception of technology (as a means to an end), ultimately hold it back in terms of accounting for the interpretative and active facet of technical systems.

It is in the final chapter, concerning Merleau-Ponty's ontology, where I was able to answer the research question and how that Merleau-Ponty's notion of the flesh is able to account for the two sides of

algorithmic systems' existence and in so doing is able to characterise these systems as active and co-constitutive beings. The flesh allowed for me to describe human-technical relations outside of instrumental and representationalist accounts, and opened up the possibility to talk about the relationship between human subjects and technical beings in terms of a shared world, and of an "intercorporeity". Importantly, these insights trouble the subject-object dichotomy still present in Merleau-Ponty's earlier thinking, and sits in line with the ontological status of these systems. Indeed, the flesh means that we can ontologically speak of these systems in a way that is consistent with our experience of them.

The last issue that need be addressed is how, all that has been explored, helps us to think about living *with* technical systems. How can we move forward with an understanding of computational beings as active and co-constitutive? I believe that there are some far reaching implications to overcoming an instrumentalist account of these technologies. The most important of which, I believe, is the opening up of ground for technical systems as ethical, political, and cultural agents. Indeed, at a time where rudimentary forms of artificial intelligence have been emerging, to posit ontologically that technical systems are co-constitutive Beings outside of the objective scheme grants them a particular agency. We have already seen in Hayles, for example, an advancement of technical agencies through her "nonconscious cognitive" construction (Hayles 2017, 9-40). Here she suggests that we can perhaps even begin to take these systems as ethically responsible for their actions because we can see that they act freely, if freedom is constituted by the ability to make choices on the basis of interpreting information (36). Hayles' specific example is aimed at automated drone systems that are able to decide on whether or not to carry out drone strikes – here of course, there are a multitude of ethical and political facets all of which need take seriously the systems' status as an active and constitutive being. This serves as just one example, but what this thesis has attempted to do is provide the philosophical, and explicitly ontological, foundations onto which we can really begin to think about these systems as beings that make a difference in the world, that make meaning, and through which we are inextricably enmeshed on many levels of human existence.

REFERENCES

Aho, James & Aho, K. 2008. 'The Lived Body'. *Body Matters: A Phenomenology of Sickness, Disease, and Illness*. Lexington Books. Plymouth. 15-33

Aristotle. *Aristotle's Physics*. Books 1 & 2. Oxford: Clarendon Press., 1970

Bacon, Francis. 1627. *The New Atlantis*. The Floating Press. 2009.

Bannon, Bryan. 2011. 'Flesh and nature: Understanding Merleau-Ponty's relational ontology'. *Research in Phenomenology.* 41: 327–357

Besmer, Kirk. 2007."Merleau-Ponty's Phenomenology: The Problem of Ideal Objects". *Continuum Studies in Continental Philosophy.* Vol.12. Bloomsbury Academic.

Brey, Peter. 2000. "Technology and embodiment in Ihde and Merleau-Ponty", in *Metaphysics, Epistemology and Technology*, 19, pp. 45-58

Dalmasso, A.C., 2018, "Techno-Aesthetics and Technics of the Body. From Merleau-Ponty to Simondon and Back", in Héder M. and Nádasi E. (eds.), *Essays in Post-Critical and Contemporary Philosophy of Technology*, Vernon press: Wilmington, pp. 89–97.

Descartes, René. *Meditations On First Philosophy.* Philosophical Works of Descartes (Cambridge University Press), translated by Elizabeth S. Haldane (1996).

Ellul, Jacques. 1964. *The Technological Society*. Translated John Wilkinson. Random House Inc. New York.

Ellul, Jacques. 1983. *The Search for Ethics in a Technicist Society*, Translated by Dominique Gillot & Carl Mitcham, from "Recherche pour une Ethique dans une société technicienne", *Morla et Enseignement*. 7-20.

Hayles, Katherine N. *Unthought: The Power of the Cognitive Nonconscious*. The University of Chicago Press. (2017)

Heidegger, Martin. 1954. *The Question Concerning Technology*, Translated by William Lovitt (1977). Garland Publishing Inc. New York & London.

Hoel, Aud S, Carusi, A. 2018. 'Merleau-Ponty and the Measuring Body'. *Theory, Culture, and Society.* SAGE Journals. 45-70

Hoel, Aud S, Carusi, A. 2015. Thinking technology with Merleau-Ponty. In: Rosenberger, Robert, Verbeek, Peter-Paul (eds) Postphenomenological Investigations: Essays on Human-Technology Relations, Lanham, MD: Lexington Books, pp. 73–84.

Husserl, Edmund. I*deas Pertaining to a Pure Phenomenology and to a Phenomenological Philosophy – First Book: General Introduction to a Pure Phenomenology*, 1982 [1913]. Kersten, F., trans. The Hague: Nijhoff.

Husserl, Edmund. "Philosophy as Rigorous Science", translated in Quentin Lauer, S.J., editor, 1965 [1910] *Phenomenology and the Crisis of Philosophy*. New York: Harper & Row.

Ihde, D. (2002). *Bodies in Technology.* Minneapolis: University of Minnesota Press

Ihde, Don & Evan Selinger. 'Merleau-Ponty and Epistemology Engines'. *Human Studies*, 2004, Vol. 27, No. 4 (2004), pp. 361-376

Johnson, G. (2008). *Merleau-Ponty, Reciprocity, and the Reversibility of Perspectives.* Intertwinings: Interdisciplinary Encounters with Merleau-Ponty. Ed. Gail Weiss. pp 169- 188

Kapp, Ernst. 1877. *Elements of the Philosophy of Technology: On the Evolutionary History of Culture.* Translated Lauren K. Wolfe. University of Minnesota Press. (2018)

Küpers W.M. 2015. Advanced Phenomenology and Relational Ontology of Merleau-Ponty. *Phenomenology of the Embodied Organization*. Palgrave Macmillan, London. 27-88

Merleau-Ponty, Maurice. 1995. Nature: Course Notes from the College de France, ed. Seglard. (2003).

Merleau-Ponty, Maurice. 1945. *Phenomenology of Perception*. Translated Colin Smith (1962). Taylor and Francis e-Library (2005).

Merleau-Ponty, Maurice. 1945. *Phenomenology of Perception*. Translated Donald A. Landes. Routledge (2014).

Merleau-Ponty, Maurice. 1968. 'The Intertwining- The Chiasm'. *The Visible and the Invisible.* Trans. A. Lingis. Northwestern University Press (2000).

Merleau-Ponty, Maurice. 'Eye and Mind'. *The Primacy of Perception*. Trans. Carleton Dallery. 159-190

Mitcham, Carl. "Introduction- Thinking about Technology". *Thinking Through Technology: The Path Between Engineering and Philosophy***.** University of Chicago Press. (London). 1994. pp 2-6

Mumford, Lewis. 1967. "The Design of the Megamachine", *The Myth of the Machine*: *Technics and Human Development*. Harcourt Brace Jovanovich Publishers. 188-217.

Peters, F.E. 1967. *Greek Philosophical Terms: A Historical Lexicon.* New York University Press (1986).

Sartre, Jean-Paul. 1943 [2018], *L'être et le néant: Essai d'ontologie phénoménologique*, Paris: Gallimard. Translated as *Being and Nothingness: An Essay in Phenomenological Ontology*, Sarah Richmond (trans.), London: Routledge.

Singer, Linda. 1981. 'Merleau-Ponty on the concept of style'. *Man and World*. 14. 153-163

Stewart, Andrew. 1990. *Greek Sculpture: An Exploration*. Yale University Press. New Haven. 271-340.

Strong, Richard Charles. 2016. "Habit and the Extended Mind: Fleshing Out the Extended Mind Theory With Merleau-Pontian Phenomenology". *Phenomenology and Mind*, no. 6 (November), 122-31. https://doi.org/10.13128/Phe_Mi-19557.

Swaine, Michael R. , Hemmendinger, David , Freiberger, Paul A. and Pottenger, William Morton. "computer". Encyclopaedia Britannica, 6 May. 2021, https://www.britannica.com/technology/computer. Accessed 4 November 2021.

Verbeek, Peter-Paul.2005. *What Things Do: Philosophical Reflections on Technology, Agency, and Design*. University Park: Pennsylvania State University Press.