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Exemplar technologies : how technology informs our perceptual knowledge

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EXEMPLAR TECHNOLOGIES: HOW TECHNOLOGY INFORMS OUR
PERCEPTUAL KNOWLEDGE

A Thesis

Presented to

The Faculty of the Department of Philosophy

San Jose State University

In Partial Fulfillment

of the Requirements of the Degree

Masters of Arts

by

Joshua W. Bronson

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ABSTRACT

EXEMPLAR TECHNOLOGIES: HOW TECHNOLOGY INFORMS OUR PERCEPTUAL KNOWLEDGE

by Joshua W. Bronson

This thesis is an investigation of “exemplar technologies” and why it is that technology in general has a significant impact on our knowledge and experience of the world. Towards this end the phenomenological position of Samuel Todes is presented to establish the framework within which we encounter technology. Along with this phenomenological position the epistemological insight of Thomas Kuhn in his idea of exemplar is examined and brought to bear on the issue of technology.

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Introduction

The heart of this paper can be put in the form of a simple question. How might technology shape and reshape the way we come to know and experience the world? It does so, it will be argued, through our bodily interaction with it. This interaction can be seen as consisting of three main parts. Firstly, technology is the product that arises from human manipulation of the world to bring it into a structure that is able to meet their perceptual needs. Secondly, perceptual needs stem from the dynamic plenum between the human percipient and objects in the world. Thirdly, technology, once created, becomes an object in the world, thus instantiating an “intentional arc”¹ between humans and technology.

Why ask this question in the first place? Outside of the general philosophical value of pursuing interesting questions and difficult problems, the many issues generated and connected to technology are particularly relevant to our contemporary society. It might well be argued that the 21st century already has been and will continue to be the most impacted by technology in human history.² With such enormous impact on our lives the existence and character of technology calls for philosophical analysis and understanding. A philosophically satisfactory account of technology has not yet been fully given; the present investigation, hopefully, contributes toward such an account.

¹ Merleau-Ponty's term that essentially means, or refers to, a feedback loop. Dreyfus, in describing Todes' use of this concept, describes it in this way. “The skills we acquire then feed back into the perceptual world, which becomes more and more determinate as we learn to make more refined discriminations and have more reliable anticipations.” Found on page 395 of the article *Todes's Account of Non-conceptual Perceptual Knowledge and Its Relation to Thought*.

² This may be surprising considering the hugely significant and impacting technologies of the 20th century such as the Bomb, TV, and the Green Revolution. However, the 21st century seems to hold promise for the impact of technology on an even higher level. For a well written overview of the evolving impact of technology on modern society see Thomas L. Friedman, *The World is Flat: A Brief History of the Twenty-First Century*, (New York, NY: Farrar, Staus and Giroux, 2005).

The approach that will be taken is markedly epistemological in aim. However, the epistemological approach will be through the phenomenological structures outlined by Samuel Todes in his book *Body and World*.³ Therefore we will turn first to a summary of that work, highlighting the concepts we wish to draw from. After this summary the issue of technology will be taken up. Using the summary outlined in the first section and incorporating some insights from Thomas Kuhn as a base an extension of the major ideas from both philosophers will be developed for an understanding of technology from their particular epistemological and phenomenological positions. Lastly, a brief look at where such a view of technology might lead us will be given.

³ Samuel Todes, *Body and World*, (Cambridge, MA: The MIT Press, 2001).

Part I: Todes' *Body and World*

In his introduction Todes tells us the overall direction and purpose of his work, he says, "This is a study in the natural philosophy of the human body. That is to say, it is a study of our body's role in our knowledge of *objects*."⁴ A little further on Todes makes a comment we need to keep in mind as we investigate the position that he elaborates, "The reader is thus forewarned that the analyses presented in this study are not of our normal experience in its full complexity."⁵ This is, of course, not surprising as an analysis of our full experience would be of such magnitude that it seems doubtful ever to be completed. Todes can be understood to limit his research to a particular area of experience, namely, what could be called our basic experience of objects in the world.

One of the central themes of Todes' work is that of the active body. The active body is for Todes the body in motion, the body as a unity.⁶ This notion contains within it an underlying assumption about the world and how we, as human subjects interact with it.⁷ Todes conceives of the body and of the world in sharp contrast to Hume and Leibniz, who in their turn should be considered in contrast to Descartes. Todes argues that both Hume and Leibniz effectively veil the body. They do so, in large part, as an answer to the dilemma that becomes explicit within Descartes' system.

⁴ Ibid., p.1. Emphasis in original. Though published in 2001, with a previous publication in 1990, the book is based on Todes' dissertation from Harvard in 1963 called *The Human Body as Material Subject of the World*.

⁵ Ibid.

⁶ Todes makes this point by saying "Consequent to [the] loss of a basic feeling of unity in the body, is the loss by the body feelings of their capacity actually to mobilize the whole body into action. This involves loss of *coordination*" (46). His emphasis. His example of this is catching a fly ball. We would be unable to do so if we acted "limb by limb" instead we must act through our body as a unity.

⁷ His original dissertation title *The Human Body as Material Subject of the World*, is perhaps more accurate in pointing us toward his major thesis. Saying the human body is the material subject of the word is in direct opposition and response to the problem framed by Descartes, given its extremes by Hume and Leibniz and then partially answered by Kant. We will discuss Kant later on.

Descartes can be seen as drastically altering the picture of how the human subject relates to the world from how it had generally been conceived in Western philosophy. A classical view would be that the unity of the world should be understood as fully outside of the human subject. Referring to the classic view Todes says, “The unity of the world can be shared by the human subject insofar as he achieves perfection”, that is, insofar as “one becomes, in respect to form, what one knows.”⁸ Full perfection was equated with the unity of the world. That the unity of the world, and thus perfection, was seen as residing outside the human subject in antiquity can perhaps most clearly be seen in Plato’s allegory of the cave and the divided line. Both of these stunning allegories convey to us that the unity of the world, the most real, solid and lasting actuality, is purely formal and reached only through contemplation. This contemplation is, importantly, not a reflection directed inward; rather, it is a contemplation of the Forms, which though ambiguously located are certainly outside of the human subject. The human subject, in the classic view, comes fully in contact, or identifies most perfectly with, ultimate reality only insofar as the capacities of the mind are able to reach outward and discover (or recollect on Plato’s part)⁹ the purely intelligible principles that unify the world. It is this way of understanding the relationship between the human subject and the world that is reformulated and restructured in Descartes philosophy.¹⁰ Descartes does

⁸ Ibid., p.10.

⁹ The “Doctrine of Recollection” is often pointed out in both the *Meno* and the *Phaedo*. Plato’s description of this doctrine can be found in the *Meno* at 80d-84b. In the *Phaedo* the relevant passage is 72e-74b. *Plato: Complete Works*, ed. John M. Cooper, (Indianapolis: Hackett Publishing Co., 1997), p. 880-883, 63-65.

¹⁰ Though Descartes certainly can be credited for this transition to a focus on the individual he cannot be said to be the first philosopher to take this significantly different approach from antiquity. Augustine 350-430 CE was the “first thinker in Western philosophy actually to *do philosophy* from a genuinely first-

this chiefly “by the argument of the cogito” which draws our attention to “the necessary (indubitable) existence of the human subject.”¹¹ Though all else may fall victim to doubt, the self, in the end, cannot be dispensed with. By utilizing this argument Descartes effectively turned the focus of philosophy away from a search for formal unity outside the human subject to an attempt to determine what within the human subject is categorically necessary, even for the skeptical attitude.

Todes points out that this move by Descartes leaves the human subject in an indeterminate position because he defines the human subject as a purely thinking subject receiving sense data passively, and yet does not raise the human subject to the full-fledged unity of the world itself.¹² He leaves humans without a clear position in respect to the world.¹³ It is this ambiguity, Todes argues, that both Hume and Leibniz attempt to resolve and, in the end, what led them both too extreme and untenable positions.

Leibniz, in effect, opts to place the full unity of the world within the human subject’s mind. Todes puts it this way: “The extension that Descartes cast out of the representational world of the human subject became, partially for Descartes and wholly for Leibniz, a purely abstract, logical construction.”¹⁴ Descartes had cast extension out

person point of view” (3). Gareth B. Matthews, *Augustine*, Blackwell Great Minds, ed. Steven Nadler, (Malden, MA: Blackwell, 2005).

¹¹ Todes., p.13.

¹² The unity of the world for Descartes resides in his conception of God. In this respect he is in line with the classic view as he conceives of God as being outside the human subject. However, his focus is primarily on the human subject. He attempts to demonstrate indubitably that the human subject, by pure introspection, can gain justified knowledge of God, and since God is the architect and therefore unity of the world, he supposes we can reach the world through introspective knowledge. The world, then, is separate from us and only known passively as representations. Yet we can, Descartes argues, know the world through knowledge of God that stems from knowledge of ourselves.

¹³ This dilemma, often called the mind-body problem, is looked at by Todes with an emphasis on its consequences for how we understand the body and thus the world.

¹⁴ Todes, p.31.

by arguing that we cannot experience the world directly. Instead, it is only secondary qualities that are held to be perceivable and all spatial qualities are thought to be only conceivable by logical reflection, thus never being experienced directly. Extension becomes something telling only of the human mind and not of the world. Leibniz took this to the extreme by casting all qualities and all reality into a logical order contained within the rational monad, which is to say the mind. For him, time, motion, space and everything else both perceptual and conceptual are merely aspects of logical possibility. Leibniz puts this elegantly when he says, “The present is big with the future, the future might be read in the past, the distant is expressed in the near.”¹⁵ Clearly the body has now been fully veiled on this account, or even abandoned.¹⁶ In principle reality could be known exhaustively through comprehending logical relations within the mind. The body is “had” only in the sense that we “have” the whole of reality through explication, but with no context or circumstance. In essence, the body does nothing whatsoever in our epistemic lives, it plays no part in our connection to the world.

Hume takes a different route, emphasizing the other stream of Descartes thought. Rather than supposing that the human subject, through explication of their own mind, can fully comprehend the unity of the world, Hume conceives of the human subject as a spectator. “For Hume, thus, the ‘uniformity’ of nature lies primarily in the regular way it *changes* appearance time after time.”¹⁷ Impressions come to us as passive observers. We have no other way of gaining access to the impressions, that is, there is no set of self-

¹⁵ *Leibniz Selections*, ed. Philip P. Wiener, *The Principles of Nature and Grace, Based on Reason*, (New York: Scribner’s, 1951), paragraph 24; quoted in Samuel Todes, *Body and World*, (Cambridge, MA: The MIT Press, 2001), p.33.

¹⁶ It seems to make little sense to even speak of perception at all on this model.

¹⁷ Todes, p.74. Emphasis in original.

contained logical relations we can grasp through the use of our mind that will explain the appearances. This is so because it is a one-way track from impressions to appearances to ideas. The body, like all other objects in the world, is known to us only through impressions and appearances. Hence we “have” our body in the same way that we “have” the other objects of the world; purely as the impressions and appearances that are presented to a detached spectator.¹⁸ For Hume, in contrast to Leibniz, the body is veiled by being fully in the midst of circumstances, but with no avenue or means for distinguishing it from others. Again, the body is veiled and has no impact on our epistemic lives. The human subject is therefore split away from the body, and the unity in the world, if it could be called that, is only in the regularity of impressions that impact the mind.¹⁹

In response, Todes outlines the nature of the active body and how he believes that through our body we gain objective perceptual knowledge of the world. As we have seen, the way Descartes and thereafter British Empiricism and Continental Rationalism, with Hume and Leibniz as chief representatives respectively, formulated their philosophies left little or no room for the body, to say nothing of its potential role as an active participant in our perception and knowledge of the world. The body was treated as essentially inactive either through being regarded as merely one object among many (Hume), or as

¹⁸ Both Leibniz and Hume have one thing in common, they place the human subject in the position of explicating the world instead of ordering it, as Descartes had. “The function of the world that Leibniz and Hume attributed to man was that of explicating the unity of the world. The human subject was identified as the agent making explicit an order that he merely discovers as already in his world of experience as soon as he has this world” (p.24.).

¹⁹ See page 40 in Todes. This clearly shows why it is that Hume could not discover any reason for any greater certainty in causation other than that it tends, or has tended to happen. As a pure spectator, with no access to the world other than passive receptivity of sensations, we are left with no explanation of the world or the objects we seem to find within it. In the same way we have no explanation of our physical selves.

being only one aspect of a static, fully defined logical reality (Leibniz). In either case the human subject is aware of the world, and his body, inactively. Todes points out that this aspect of these major veins in philosophy falls inward on itself. It does so because “inactive awareness is always a motivated withdrawal from conscious activity. It is a way of experiencing things that acknowledges the active foundation of experience by being itself an attempt to solve those problems of experiences that only active experience can pose and render formulable.”²⁰ In other words, we abstract from the enmeshed and embodied experience by reducing the situation to a frozen “problem” that we can then hold up and investigate through contemplation. Take, for example, the experience of designing a garden. The empty piece of land facing the future gardener presents a problem. The problem is what way the garden should be organized within the particular context. The gardener could simply walk out and begin digging and planting, yet it would be to his advantage to abstract from the problem by drawing a diagram of the piece of land. Once the diagram is in hand the gardener can be inactively aware of his garden and therefore can ponder what plants should go where.

The division and impasse between Empiricism and Rationalism is not a unique recognition on the part of Todes. One of the main objectives of Kant’s philosophy was to solve this very dilemma. Todes recognizes this and much of his work is an attempt to amend Kant’s project, which he believes failed, in the end, to provide a satisfactory answer to how we come to know the unity of the world. As he puts it, “My innovation

²⁰ Ibid., p.52.

consists wholly in applying Kant's general argument at a different point in experience."²¹

The point of experience that he focuses on is that of the lived active and embodied experience.

How is it that we experience the world when we are actively engaged within it? To be actively engaged necessitates perception and "perception is determination of an object through an effective response that forms a skill in the percipient."²² Todes' definition of perception is not logical, *per se*, but rather phenomenological. Take, for instance, the common activity of typing. When we approach a keyboard we perceive the object by means of an effective response to it. In other words, we position our hands in the appropriate position for successfully pressing the keys. But, how is this action determining? We must be careful at this point not to jump to the spectator position, which seems so natural to us. The point is how we *actually* and *firstly* experience the situation, not how we are *able* to reflect on it in the aftermath, which, as already pointed out, would be a motivated withdrawal to inactive awareness for the purpose of solving a problem only possible in active interaction with the world. Our response to the keyboard is a determination in that it demonstrates our position in regards to *this* particular object and not another. Todes gives a technical name to this. He calls this our "poise". By poise he is referring to the active coping and anticipatory readiness of the active body. Poise does not need to be something that we are consciously aware of, indeed, most of the time it is hidden from us. Even when one is, say, poised for action, we are not usually

²¹ Ibid., p.75. Todes' gives a detailed and highly technical critique of Kant, which for the most part is beyond the scope of this paper, though later on we will look a little closer at what Todes says about Kant.

²² Ibid., p.78.

directly aware of our body in its readiness; rather, our conscious awareness *assumes* our body's readiness.²³

This conception of poise is essential for Todes' solution regarding how it is that we come to know objects in the world and how there can be a unity in our experience without resorting to some form of idealism. This is so, according to Todes, because "the primary form of directed action is an intention of the *body*, a body-directedness [poise], which first gives us the global sense of space and time presupposed by all our higher personal forms of directed activity, principally those of will and judgment."²⁴ This is a different answer to the problem from the one given by Kant who instead argued that all knowledge must be based on concepts that stem from the syllogistic forms of judgment found in the Table of Judgment and the Table of Categories. Todes summarizes how Kant understood the process of knowledge in this way:

All empirical knowledge, according to Kant, has the following form. (1) Through an abstract universal judgment, the relation between two concepts is abstractly understood as capable of being given sense. (2) Through an intuitive judgment, sense is then given to the subject-concept of the abstract universal judgment. (3) Through a concluding intuitive judgment, sense is thereby also given to the predicate-concept of the abstract universal judgment.²⁵

Kant would then be saying that the human subject is actively engaged in creating her own experience rather than being passive, as those before him had assumed.²⁶ For Kant we

²³ Perhaps an exception to this is when one does mental imaging in preparations for certain sports. Often times one's performance can be enhanced if one consciously imagines, in as much detail as possible, one's physical poise, in the typical sense of the word, for a particular maneuver.

²⁴ Todes., p.65.

²⁵ Ibid., p.214.

²⁶ As noted above, both Leibniz and Hume saw the human subject as merely *explicating* the unity of the world. Here Kant, and Todes for that matter, can be seen as arguing that the human subject does more than merely explicate, instead, the human subject in some way actively takes part in the very ordering of the world in the first place. In general Kant sees this as happening by means of judgment and Todes by means of poise.

make our experiences intelligible by bringing concepts to bear on them. This is a key part of how Kant attempts to bring about his Copernican Revolution thereby answering the dilemma of Hume and Leibniz.

The difference between these two formulations, Todes saying poise is primary and Kant saying judgment is, becomes starkly clear with the issue of space and time. For Todes space and time are functions of the perceptual field. Todes describes “the perceptual world as a field of fields-within-fields.”²⁷ The horizontal field is where we experience objects in their places, that is, as being relevantly placed in reference to ourselves. It is, however, the vertical field that is the primary field for it is within this field that everything moves about. This can thus be called the world-field. To demonstrate this Todes points out that an experience of vertigo completely destroys our sense of being-in-the-world and the horizontal field is dependent upon the vertical. We could not place objects in an ordered relation to our point of perspective without being successfully balanced within the vertical field.²⁸ Thus the horizontal is derivative of and within the vertical field, a field within a field. Hume, because of the basic assumptions in his philosophy, had significant trouble with space and time. In the end Hume could only suppose that both space and time were somewhat illusory, not having any deep sense of necessity. Todes argues that Hume could not find any necessity in space and time precisely because he conceived of the human body as being inactive, and thus the human subject can only ‘have’ his body in the manner that he has all other objects, namely, through observation. But, Todes suggests, “It is only through body movement that we

²⁷ Ibid., p.114.

²⁸ The body and its natural balance is essential to how we both perceive and know the world.

gain a sense of a *global* space in which various apparent objects can be located.”²⁹ For example, suppose someone takes an evening stroll. The light is dim, softening the edges of the surroundings. Though quite beautiful, such conditions make it difficult to distinguish, that is, determine, an object. When an object presents itself in the dim light, shrouded and unclear, how might the person proceed? If one desires to know what the object is, then the only way to proceed is to move toward the object. By moving one brings the object, which is determinable, that is, open to being determined, into a position within the horizontal field where it can become a determined object. After coming closer, the person is able to perceive clearly that the object, unknown before, is, in fact, a rather large rock of unusual shape. Though the rock may have at first appeared as a large troll, the illusion is shattered by movement. The *appearance* of a troll is not unreal, per se, and this is one of the strengths of seeing perceptual knowledge as being embedded within the active body. “To *have* a determinate perceptual field (of one’s own) *is* to have evidence of one’s general, though not unerring, capacity to effectively determine objects with one’s present skills.”³⁰ In the example above the present skill that was utilized was that of “knowing” how to move in a way that brings the object “closer” within one’s perceptual field, which is necessarily centered within oneself. This movement effectively

²⁹ Ibid., p.48. Emphasis in original.

³⁰ Ibid., p.79. Emphasis in original. This is an important point as it undermines the doubt and ambiguity created by Descartes method. For Descartes there was no way to know whether an experience was one of an object of the *actual* world or one of illusion, though he tried to gain that certainty by working outward from the cogito, to God, and then to the world. The appearance was indistinguishable from the actual object because there was no movement, no active body. But perception simply is to be able to move, it is to be actively within circumstances. “It is impossible in principle that any function definitive of ‘perceptual’ activity be inoperative in perceptual experience; for the possibility in question is self-contradictory.” (p.78)

makes it possible for the object to be determined, that is, skill is having the correct poise for the context.

Kant replies to Hume as well, but, as already mentioned, he does not see space and time as being correlative to the active, moving body and its poise in regard to the world. Rather, Kant supposes space and time to be necessary conceptual categories that we then project onto, or into, our experience. “Kant is clear that knowledge of inner sense (time) as well as outer sense (space) is first made possible by an imaginative syntheses of the sensible form of intuition.”³¹ This comment ties into the heart of Todes’ critique of Kant, which is the main argument of his book. Todes goes to great length and detail to demonstrate how it is that Kant has “imaginized”³² perception, and indeed, because he leaves the body and its senses no other job than generating the raw substance that is then taken up and formed by the concepts of the imagination, everything is in the end only in the imagination. By imaginizing, that is, bringing things into the conceptual imagination, Kant achieves unity and necessity, but only, Todes argues, for what we can conceive within imagination. Kant’s answer, his Copernican Revolution, was to propose the synthetic a priori as what would carry the burden of the unity of the world and act as the effective bridge between the human subject and that world. In doing so, however, he ended up giving an account only of the necessary ground on which imagination must function but was unable to give a successful account of perception. “Perception is of something encountered in our actual experience *in* the world. Imagination is of something entertained merely in our imagination, and not in the world. What we imagine

³¹ Ibid., p.181.

³² Todes uses these active forms of imagination as a way of describing Kant’s approach.

may objectively pertain to the world as representing something about the world, but it is not itself in the world.”³³ In other words, objects of perception are open to being determined as *particular* objects. An object of the imagination does not appear to us in this way, but rather it is fully determinate. Todes argues that there are no “surprise” sides of an imagined object, whereas an object that moves from determinable to determined in the world of perception can, and often does, surprise us.³⁴

With this understanding we can see why the idea of poise is so important. It is by means of poise that we gain what Kant missed, that is, we are able to determine objects in the world *before* we draw them up into our imagination. Perhaps a place where we can see the intricate and subtle interaction between perception and imagination is in the activity of reading. What is taking place when we are engrossed in a good novel? Certainly we are fully engaging our imagination. A picture, feelings, even smells may play across the screen of our imagination as we follow the story. This flight of our imagination is not the only thing taking place, however. There is another essential activity transpiring. We must perceive the book in order to entertain in our imagination the plot presented to us within the pages. In doing so, in perceiving the book itself as a *particular* physical object, we must have correct poise so that we can respond to it in the appropriate manner. Similarly to the illustration of the keyboard, it is our active coping in regards to the object that determines the perceived object. If we have not learned the effective skill of how to cope with the kind of object that a book is, then we would be at a

³³ Ibid., p.138.

³⁴ Chapter five focuses on this issue and the critique of Kant in chapter six, the longest and most difficult chapter, rests upon this thesis, namely, that Kant has imaginized the body. Todes, in response to Kant, works out a Table of Perceptual Categories, which is included at the end of this paper.

loss of what to do with it and could never get as far as being able imaginatively to conceive of its contents. A key thing to recognize in this is the background character of poise.

Poise does not, when successful, “coincide” or “agree” with its later “effects,” as does will with its achievements. Rather, when successful, poise *is* its own effect... In willing, I can clearly distinguish *my own act* from *what it makes of my circumstantial objects*... But in poise, no such distinction is possible. My poise is the way I make of my circumstantial objects—merely the circumstantial object that they originally are, viz., those of felt, active experience.³⁵

Poise establishes the possibility of action and of higher purposes, such as intention, for one must intend to act with something but can only do so within a field where there is something available to act upon. We recognize objects first by means of poise, yet in bringing this recognition it does not go further itself. In some ways it is so basic, so common to our experience that it can easily be missed.

Todes is not arguing that our poise fashions the world on its own. That, after all, would be some form of idealism and is precisely part of what he is attempting to combat.³⁶ Here is an essential quote that shows how Todes conceives of the interaction between the actual world and our poise in respect to it.

To be sure, the world of human experience is the humanly habitable world, not just because we make it so, but because the world enables us to make it so.

³⁵ Ibid., p.66. Emphasis in original. This point parallels the concept of tacit knowledge developed by Michael Polanyi in his book *The Tacit Dimension*. Michael, Polanyi, *The Tacit Dimension*, (Gloucester, Mass: Peter Smith, 1983). Tacit knowledge is proposed to be non-conceptual knowledge as well, and Polanyi effectively argues for its existence. Todes, however, in describing perceptual knowledge gives a more in-depth explanation of how and why this is possible. In so doing he covers and goes beyond what Polanyi describes therefore subsuming tacit knowledge within perceptual knowledge. While Todes finished his dissertation in 1963 at Harvard, Polanyi solidified his ideas on tacit knowledge during the same period, while giving the Terry Lectures in 1962 at Yale. Polanyi had been formulating his concepts since 1945. Both concepts went strongly against the heavily analytic and positivistic philosophical scene of the time by focusing and emphasizing the role of the body instead of logic and language.

³⁶ The second introduction by Piotr Hoffman does an excellent job of showing how Todes manages to escape the idealism that beset Heidegger and Merleau-Ponty.

Nevertheless, the world does not compel us to make it so. Our actually making it so is internally prompted by our own needs; and our way of making it so (our skill and oriented horizontal field) is our own production within the merely limiting world.³⁷

The world does not compel us to make it habitable because we can be more or less skillful in how we engage objects within it. Coping with the world is a *skillful* action; it is something that can be learned and applied in a better or worse manner. The world, and the objects within it, is open to our manipulation through skillful coping. The world is limiting in the sense that our manipulation and coping within it is an engagement of it, and therefore has to be in terms of its characteristics. When we perceive an object it goes from being vague, meaning not-yet-determined, to becoming particular, meaning unique, circumstantially set, and determined. The key, however, is that we come to *know* this particular object and its unity, that is, its circumstantial situatedness, primarily by means of our poised active bodies. "Perception of the unity of an object *precedes* perceptual determination of it. But conceptual understanding of the unity of an object *awaits* conceptual determination of it."³⁸

Todes suggests that we are prompted to engage in this world out of our needs. He is not referring here to conceptual needs, as in needing a new Ford pickup; rather he is referring to the basic sense of orienting oneself. He calls this a search for oneself. That may sound slightly mysterious but it is quite a straightforward idea. If one wakes from a disturbing or extremely vivid dream, this searching for one's self becomes pronounced. In such a situation one might sit up suddenly, look around the room, and even feel about

³⁷ Ibid., p.176.

³⁸ Ibid., p.195.

one's self. As one's surroundings become familiar again, a feeling of relief will pervade both thoughts and body. Though coming out of a state of disorientation is extreme we continually orient ourselves to the world around us. We might call this meeting our perceptual needs. Todes puts it this way; "We actually *find* our self in the midst of circumstances by *responding* so as to determine something present *in* some place *in* our circumstances *in* the horizontal field *in* the world."³⁹ Recognizing our dependence on our circumstances and our being-in-the-world can also be seen in the damaging effects that happen when humans are deprived of their sensual circumstances. Such things as solitary confinement, sensory deprivation experiment, the loss of vision, or even the passing of a loved one are all extremely devastating to our sense of our self and of the world around us.

What is it about the objects in the world that allow for us to find ourselves through responding to them? Just how does this happen? Todes describes four basic quadrants or fields in which our active experience of the world must transpire. The first is "the sense of the *primary field* of all passage of time, borne by the world-field;⁴⁰ [secondly] the sense *that* there is some passage of time, borne by the general horizontal field; [thirdly] the sense of *where* this passage of time is taking place, borne by the circumstantial field; [fourthly] the sense of *what* has taken place with this passage of time, borne by the place the event has taken."⁴¹ All four of these fields must be present for the there to be the possibility of perceiving an object. These four fields rest upon the active

³⁹ Ibid., p.117. Emphasis in original.

⁴⁰ The world-field is the vertical field mentioned above. This is an invariable field in that all other perceptual objects must be within it. Without it there is no possibility of delimiting anything whatsoever.

⁴¹ Ibid., p.105. Emphasis in original.

body of the percipient. Time is bound up within each field because to be a percipient *is* to experience the passage of events, which are “the objective correlate of the self-activity of the percipient.”⁴² That is, objects are perceived in relation to the percipient. All things are perceived as being relative to the one perceiving. Whenever an event is perceived it is done so through the poise of the *active* body thus satisfying our perceptual needs.

For instance, when an event involving an object occurs, such as a coffee mug falling off a desk, what is it that we perceive? Do we perceive it in a strobe-light manner, capturing a series of distinct and separate “moments”? Todes does not think so: instead, he argues that we perceive a “flow of orientation.”⁴³ For instance, a coffee mug begins in a particularly oriented context, on the desk in front of the percipient. As it is falling we perceive the motion, or flow, toward its terminal orientation; broken on the floor below the percipient. The flow of the event happens within the four fields described earlier. First, there is, as it were, a background set within which the whole event transpires, i.e. the world-field. Second, within the horizontal field we can distinguish between this and that object, and thus can perceive that it is the coffee mug which has fallen and not, say, the lamp. Third, the coffee mug fell off the table and hit the floor, that is, the circumstantial field distinguishes the particular place in which the event has taken place.

⁴² Ibid., p.103.

⁴³ Ibid., p.110. This is essentially like one answer to Zeno’s paradox. Zeno argued that there could be no motion because between point A and point B there are an infinite number of points. This paradox, however, has been argued by some to rest upon a confusion of terms. Todes is similarly arguing that it is a confusion of terms when we assume that we must perceive all the points between A and B. Perception, instead, works as a flow. A flow is a transition from one orientation to another. An object is oriented and transitions to a differing position of orientation and that is exactly what we perceive, not the hypothetical points between. We are able to *anticipate* its end result because of poise. Todes puts it this way. “Imaginative Space is continuous because of the way it is composed of a series of discriminable points, whereas the perceptual field and flow are continuous because they are *not* composed of any discriminable elements at all” (112).

Fourth, the flow of the event ends in the new orientation of the mug to us as percipient. These four fields arise from our active body. Todes says, “in particular, the world, as the field of all fields of our activity, is correlative with the felt unity of our active body, as the condition of all conditions of our activity.”⁴⁴ The four fields all rely on the fundamental aspect of our being active percipients in the same way they depend on the world as the field of all fields. If an event is to happen it must happen within the world, just as for us to perceive an event we must have “successfully *tracked*” the event. “Thus, once again, we can have a sense of what has come to pass if and only if we also have a sense of our self as active percipient.”⁴⁵

⁴⁴ Ibid., p. 114.

⁴⁵ Ibid.

Part II: Technology

Todes, in his introduction, tells us that “the analyses presented... are not of our normal experience in its full complexity.”⁴⁶ As we have seen Todes focuses on the grounds of perception seeking an explanation of the role our bodies play in our encounter with the world. In doing so, Todes intends to rectify the omission of the body and therefore of any substantial sense of perception in the tradition of Western philosophy. There are four major points from Todes that need to be highlighted. First, Todes argues that at root the human subject is an active embodied participant in the world. Second, the way that this active body connects to the world is through its poise. Third, our needs, our search for ourselves, prompt us in our active engagement with the world. Fourth, this necessitates that there *are* distinct objects that we encounter *in* the world. Now let us extend this position to include one more aspect of “our normal experience in its full complexity,” namely, technology.

Technology resides between the human subject and the world and does so in a way that is quite unique. Unlike “natural” objects, technological objects are dependent upon human creativity, ingenuity and direct interaction.⁴⁷ From this in-between place technology touches many aspects of our lives. But, how does it do so? From the analyses presented above there are a few implications we can draw immediately. First, one of the ways we come to know technology is through skillful coping by means of our

⁴⁶ Ibid., p.1.

⁴⁷ Hannah Arendt gives a nice description of this. “Work is the activity which corresponds to the unnaturalness of human existence... Work provides an “artificial” world of things, distinctly different from all natural surroundings.” Hannah Arendt, “The “Vita Activa” and the modern Age,” in *Philosophy of Technology: The Technological Condition*, Blackwell Philosophy Anthologies, ed. Robert C. Scharff and Val Dusek (Malden, MA: Blackwell, 2003), p.352.

poise. Second, our primary way of knowing objects in the world, including technology, is through our active body and not through our conceptual imagination. Saying that this is the primary way of knowing means it is the phenomenological ground from which conceptual understanding stems. In other words, perceptual knowledge precedes conceptual knowledge.

At first glance this may seem an odd claim when it comes to technology. After all, the design, development and construction of technology seem to flow out of intense conceptual work. The conceptualization process, however, is necessarily a secondary order of activity. Though the spectator position is often utilized in the process of creating and evaluating technology it is, as was mentioned above, an abstraction away from the perceptual experience. This abstraction thus acknowledges and is aimed at the problems and issues first found in perceptual experience.

An example of how technology aims at solving a problem in perceptual experience is seen during the construction of the Erie Canal in the early 19th century when a significant challenge presented itself to the laborers intent on digging the 363 mile long, 40 foot wide canal. The problem, essentially, was that the canal went directly through wilderness. Among the many obstacles this would entail, the stumps left after the trees were felled presented a stubborn and difficult problem. How was this problem addressed? An ingenious machine was contrived to relieve the laborers of hours of digging, prying and struggling. Not only did it make the job of removing the stumps immensely easier, it also sped the process up, which was economically needed. The machine consisted of two sixteen foot diameter wheels connected by a thirty-foot long,

twenty inch diameter axle. Attached to the center of the axle was a fourteen foot diameter wheel. The device would be secured over a stump by bracing the outside wheels with larger rocks. Next, a heavy chain would be wrapped around the axle and then around the stump. When this had been done a team of horses or oxen would be attached to the middle wheel by means of a strong rope that would be wrapped several times around it. As the animals plodded forward a gigantic amount of force would be transmitted through the axle, consequently tearing the stump, roots and all, right out of the ground.⁴⁸

What is the connection between conceptual and perceptual knowledge in the creation of such a technology? In other words, if Todes' account of perceptual knowledge is right then we should be able to see in this scenario how the problem experienced through the active body undergirds any conceptual abstraction. We do not know who developed the device described above, but we can certainly imagine how the process might have occurred.⁴⁹ The stump rises there out of the ground, right in the laborer's way. The object is known to him viscerally, probably with a strong tinge of frustration. The next step the laborer takes to solve the problem might be in any number of directions, but let us imagine a highly abstract and conceptual approach. Sitting down, he takes out his sketch pad, and draws a diagram of the situation. After some careful inspection of the stump he estimates how much force must be applied to rip it from the earth. With this number handy he proceeds to develop a machine that would be able to

⁴⁸ Peter L. Bernstein, *Wedding of the Waters: The Erie Canal and the Making of a Great Nation* (New York: W.W. Norton & Company, 2005), p.210.

⁴⁹ Ibid., p.209. Bernstein says "neither scientists nor engineers devised the ingenious laborsaving solutions to these tasks. Rather, the inventors were the men doing the hard work on the job. They remain anonymous."

deliver this amount of pulling force on the stump. Applying Archimedes' principles of the lever, he devises the leveraging mechanism described above.⁵⁰ Even in such an abstract approach we can see that it is based on perceptual knowledge. If this approach was the one used to solve the problem of ripping stumps out of the ground during the construction of the Erie Canal certainly it was a highly conceptual one, however, even so we can see that it would have been an intentional withdrawal. That intentional withdrawal allowed for an inactive experience of the actively founded problem. Without engagement there is no possibility of abstraction. The whole purpose of abstraction is the solution of a physical problem, in this case, the removal of stumps.⁵¹

There is another key aspect about this stump pulling machine to note. It utilized prior technologies. The creation of technology is a progressive activity, one that builds from prior successes. Though this is not always directly or easily seen, especially in the complex milieu of today's technoscience, in a technology like the stump puller or other relatively simple artifacts this is quite apparent.⁵² A helpful concept for understanding this is that of "exemplar" as found in Thomas Kuhn's philosophy of science.

⁵⁰ Bernstein makes a general reference to Archimedes as a way of setting up his description of the mechanisms used to clear the land. He says, "Most of these remarkable laborsaving innovations on the canal owed their success to the principles of Archimedes" (209).

⁵¹ Probably, however, the people responsible for creating this stump pulling machine did not think of Archimedes one bit. More likely they simply developed the machine through a series of trials and errors and experiments, putting together objects that they had used before, found useful, and then applied them to the new circumstance.

⁵² Modern technoscience has the same quality, the difference being that it is far more complex and often "specialized" in the sense that technologies are rarely created fully or completely by one person, or even one group. In his lecture "The Myth of the Designer" at the 14th meeting of the Society for Philosophy and Technology in Delft, Netherlands July 20-22, 2005, Don Ihde pointed out this characteristic of contemporary design. The 'myth' Ihde pointed to was that there is a designer at all.

Much of Kuhn's work in *The Structure of Scientific Revolutions*⁵³ is focused on the concept of paradigm. This concept has had a major impact on the philosophy of science as well as many other disciplines. However, despite the success of the term it soon was apparent that it became "too nearly all things to all people."⁵⁴ In response to this Kuhn recognized the too general character of the term paradigm as he had described it in *The Structure of Scientific Revolutions* and sought to clarify what he meant by it. This clarification resulted, at least partly, in two terms "disciplinary matrix" and "exemplar".

In describing how it is that a scientific community can function with effective unity, Kuhn, developed the concept of a disciplinary matrix. He uses the term "disciplinary" because it is the common possession of the practitioners of a professional discipline and 'matrix' because it is composed of ordered elements of various sorts."⁵⁵ Three of the elements that Kuhn proposes making up a disciplinary matrix are symbolic generalizations, models and exemplars. Symbolic generalizations are conventional symbols agreed upon by a group for the sake of easily recognizing particular concept. For instance, $<$, or Δx , which in mathematics mean less than and change in quantity of X respectively. Model's act in a similar way in that they help to facilitate quick understanding of complex realities, such as, regarding an electric circuit as a flow of

⁵³ Thomas S. Kuhn, *The Structure of Scientific Revolutions*, (Chicago: The University of Chicago Press, 1962.)

⁵⁴ Thomas S. Kuhn, "Second Thoughts on Paradigms" in *The Essential Tension*, (Chicago: The University of Chicago Press, 1977), p.293.

⁵⁵ Ibid., p.297.

water or picturing atoms as interacting like billiard balls.⁵⁶ Of these three it is exemplars, however, that are of interest to us so let us see what Kuhn has to say about them.

On the most basic level Kuhn defines exemplars as “concrete problem solutions, accepted by the group as, in the quite usual sense, paradigmatic.”⁵⁷ These solutions to concrete problems are paradigmatic in a disciplinary matrix by functioning as *the* problem solution according to which other problems and solutions are seen as analogous. In seeing problem solutions as analogous to the exemplar problem solutions the scientific group is able to function efficiently while at the same time maintain a strong unity in method, form and direction. Though unity in these three areas might be achieved through edict or rule-based control, the function of exemplars is quite different. The key to this difference is that the exemplar is *first* seen as analogous to other problem solutions, and not seen as identical to them through calculation. Take, for instance, a hypothetical rule such as: if you encounter x then you should do function a, b, and c to determine if x is y. A rule such as this would apply, perhaps, but only later on in the process. Seeing two problems and their solutions as analogous is a little less rigid and is more interpretational. Kuhn puts this point in this way, the scientist’s “basic criterion is a perception of similarity that is both logically and psychologically prior to any of the numerous criteria by which that same identification of similarity might have been made.”⁵⁸ There is a huge advantage to this way of discerning the connection between two, perhaps seemingly disparate, problems. “The mental or visual set acquired while learning to see two

⁵⁶ Ibid., p.297-98.

⁵⁷ Ibid., p.298.

⁵⁸ Ibid., p.308.

problems as similar can be applied directly.”⁵⁹ To illustrate how this concept would work Kuhn describes how a young child might learn to distinguish swans, geese and ducks. The child will learn this by seeing general similarities. With these general “classes,” as it were, he can easily place the next bird he sees in the right group. The child has not, as of yet at least, learned propositional rules that distinguish a duck from a goose, rather, he has learned an appropriate response to a particular set of perceptual characteristics.⁶⁰

Though Kuhn does say that the scientist’s “basic criterion is a perception” it is quite apparent that he conceives of exemplars, and the disciplinary matrix for that matter, as an aspect of conceptual reality. This is demonstrated when he says, “Our sense of ‘paradigm’ is global, embracing all the shared commitments of a scientific group; the other [sense of paradigm] isolates a particularly important sort of commitment and is thus a subset of the first.”⁶¹ Here he has not yet clarified “paradigm” as disciplinary matrix or the more particular commitment as exemplar, but that is where he is going. The disciplinary matrix, then, is seen as embracing an arranged set of shared *commitments*, and thereby is a conceptual entity. Exemplars, being seen as a subset of the larger group of commitments that make up the group, are therefore a more particular kind of concept, though an important one. What brings unity to the scientific community is their shared

⁵⁹ Ibid.

⁶⁰ Ibid., p.309-18. Kuhn seems to see this process in a purely physical manner. He says, “I ask now, what has happened to Johnny, and I urge the plausibility of the following answer. During the afternoon, part of the natural mechanism by which he processes visual stimuli has been reprogrammed, and the data he receives from stimuli that would earlier have evoked “bird” have changed.” Now the stimuli evoke, goose, duck and swan according to how he was taught. Whether or not this is physiologically the case is not certain and it may be that to hold that it is narrows our understanding of how an exemplar might be *learned*, that is, learning seems a more complex process than response behavior analysis generates. The bell ringing may bring the dog to salivate, but the presence of a duck leading the child to recognize the ducks similarity to other ducks seems a different thing.

⁶¹ Ibid., p.294.

conceptual framework. This seems largely correct. However, the body, yet again, has gone missing and its role in laying the foundation for the very conceptual framework that makes the unity in the disciplinary matrix possible is only partially seen. This is not to say that focus on the embodied self is antithetical to Kuhn's philosophy; rather, it is that Kuhn's focus was on explaining how scientific communities function and change.

How, then, does the concept of an exemplar help us when looking at something like the stump puller described above, or any other technology. As mentioned, in creating the stump puller those responsible used prior technologies. In doing so, they had to make decisions as to what technologies were best suited to the way they saw the problem that presented itself to them. Deciding in what manner to approach the new problem is done in comparatively the same manner as the decision of what kind of exemplar a new problem, say, in physics is analogous to. Thus we could rightly term some technologies as "exemplar technologies" just as certain problem solutions and experiments are exemplary in the sciences. Though these two kinds of exemplars are similar, there is a difference. Exemplar technologies, at least for the most part, function on a more basic level. It is more basic in the sense that it is more directly perceptual than the more abstract and conceptual exemplars that Kuhn describes.⁶² An exemplar technology consists, at least in part, of the physical manipulation of objects in the world which we then interact with bodily. Conceptual exemplars, on the other hand, could be purely abstract, as in theoretical mathematics.

⁶² This is in part because oftentimes, and especially in the "high-tech" industries the process happens much in the same way that Kuhn describes. It is, however, quite beyond the scope of this study to delineate between higher more institutionalized technologies and the social groups that construct them and more basic ones. My main aim is to see why it is that technology in all its forms and levels has such a significant impact on our knowledge and experience of the world.

Speaking of exemplar technologies raises an essential question. Where does the exemplar characteristic reside? Are exemplar technologies particular kinds of technologies that we can classify by finding common characteristics among them? Does a technology gain its exemplar characteristic because it was designed to be so? Does the exemplar character of certain technologies reside purely in the human subject's mind? Neither placing the exemplar characteristic in the human subject or in the technology itself is accurate. Instead, an exemplar technology is something that can only exist within the dynamic meeting of the human subject and the particular technology. The exemplar characteristic cannot reside within the technology only because to be an exemplar is not a potential or latent power, rather it is actively to inform human choice.

At the same time, however, an exemplar technology is not purely conceptual, and thus is not purely within the human mind. For instance, because it is our active body through movement that gives us the capacity to conceive of space, then the essential avenue for change in our conception of space is grounded in our moving bodies, which in turn, can be acted upon by technologies.⁶³ This intentional arc can be seen if we imagine what might happen to a hypothetical Stone Age person brought into the present day and introduced to a car. For someone who has never traveled faster than the 30 miles per hour of a galloping horse the tremendous speed of a car would not only be shocking but

⁶³ Above, in the first section, this statement from Todes was quoted: "For it is only through body movement that we gain a sense of *global* space in which various apparent objects can be located." Todes is making this comment to counter Hume's belief that there is no possibility of finding any degree of necessary connection between impressions. "This is so because in movement alone we are not restricted to being passively aware of objects, in the way Hume thinks characteristic of all our experience"(48). For Hume 'action' only comes when we combine ideas within our mind. Though it is possible to conceive of how we may gain a new understanding of space purely through contemplation, that is, through the careful putting together of ideas, it is still the case that perceptual knowledge is at root. This can be seen because in order to test this new conceptual understanding we seek a way of experiencing it. Section 41 and 42 of Arendt's *Vita Activa* speak directly to this issue as well.

could open up ways of conceiving of space not possible before. The world could all of a sudden appear to be “smaller” because the distance between point A and B would be less in the sense that traversing between them would take less time and effort. That is to say that often times our conceptual knowledge flows out of perceptual knowledge. In this case the Stone Age person might come to a significantly different understanding of the world because of the changed circumstances. Though perhaps it would be possible to gain this new insight by pure contemplation, the car, in this situation, would seem to play an immensely important role.

Another demonstration of this point from a different angle can be seen in the invention of the watch or clock. Because this technology is so imbedded in our world today it may be hard to imagine but originally the watch was not intended for the various practical means it has been put to since. Quite to the contrary, the watch was at first intended for use in experiments, not for keeping track of the day, time on the job, or when to meet for dinner.⁶⁴ However, despite this being the original intention and means that the inventors put the new device to, it soon found its way into a wide variety of practical use. We can see here the intentional arc yet again, as once the technology is created it goes on to feed back into the knowledge of its users, opening to them new characteristics and possibilities. Though a technology may be created, or used in a particular manner at first, it is often the case that, in the aftermath, some new use will be seen that was never conceived of in the process of creating the technology.⁶⁵ To put this point in the

⁶⁴ Arendt, p.357.

⁶⁵ This has been seen time and time again throughout history. Don Ihde in his book *Philosophy of Technology* makes this comment; “Only sometimes are technologies actually used (only) for the purposes and the specified ways for which they were designed. Two interesting examples of this have been the

language of Todes, the technology becomes an object that we encounter in the world. An encounter must be of a particular object. We encounter *this* watch, not watches. In encountering *this* watch we also encounter it in a particular context. We find ourselves in the context by moving the object from determinable to determinate. To experience the object, then, we must perceive it as relative to us as the percipient by perceiving it through the poise of our active body. For instance, if while walking down steps one's poise fails to account for the last step the body will fail to anticipate where the ground is and until the ground is again perceived in correct relation to the body it will be lost to the body.

What has just been described would be true of all our encounters with technology, including exemplar technologies. An exemplar technology, then, is one through which this encounter gains a particularly strong hold on our perceptual and conceptual knowledge. The exemplar technology is exemplary precisely because as we encounter other objects and technologies we do so expecting to find a similarity in them with the exemplar technology. The expectation can be both conceptual and perceptual. It is perceptual in that our poise is set for a particular kind of object. Since our poise is what makes an object determinate, our expectant stance toward a new context and object will follow from some past instance that we believe to be similar to the new context. If we think again of the Stone Age person encountering a car for the first time we can assume that such a person would have an inappropriate stance in regards to the vehicle. Never

typewriter and the telephone. Both were originally intended as helps for impaired persons... What was to become their extremely important set of social uses ultimately entailed little of the original designer intent" (116).

having experienced a car, let alone any other kind of vehicle, a Stone Age person would not know what to expect, bodily or mentally.⁶⁶ In other words, the Stone Age person could have no exemplar in their experiential stockpile to inform them as to how they should be poised in regards to this new object.

We can see that exemplar technologies play an essential role in the creation, evaluation, and recognition of technological artifacts both perceptually and conceptually. When the laborers who built the Erie Canal were faced with the difficulty of having to find a way to remove stumps they relied upon their prior experiences with technologies to inform them of the best way to approach the problem. To suggest that they relied on exemplar technologies is to suggest that in relying on prior experience they did not rely equally on all experiences simultaneously. On the conceptual level it is quite obvious that we cannot entertain all prior experiences simultaneously. This is also the case perceptually. We tend to expect more readily certain contexts, objects and behaviors than others. When it came to the stumps the technological approach that appeared most applicable would have been the approach that seemed to the laborers the most similar to some prior scenario, specifically, an exemplar technology.

Exemplar technologies are an essential aspect, but they are not the only aspect of what needs to go into the creation and evaluation of technologies. Our perceptual needs, the need to orient ourselves within the world-field to objects, also play an essential role. We have learned from Todes that one of the key functions of the active body is that it is

⁶⁶ An effective poise in respect to the classic Model T and an H2, a modern monstrosity, is in most respects the same. Though there are many innovations that have gone into something like the H2 at base it is in the same vein as the Model T.

the vessel through which we find ourselves in the world. This search for ourselves, as Todes terms it, is accomplished through our orientation to the world and to the objects we encounter within it. Our perceptual needs stem from the anticipated events we know through our poise. When it comes to technology, perceptual needs play a slightly different role than usual. Our perceptual needs act as both the instinctive standard and the motivation for the creation of particular technologies. This is not to say that money, power, fame or any other complex social or psychological factors are not motivations, rather motivation here refers to the basic, even pre-conceptual, need to construct and manipulate the world in a way that is aimed toward orienting it toward our bodily existence. Take for instance the telescope. Whatever conceptual factors went into Galileo's work and achievement in constructing such a device it was perceptual needs that determined that the telescope would be intelligible to the human eye. In other words, our active body acts as a kind of limit to how technology is created. Though perceptual needs act as a limit, it is not a constricting limit. There are many technologies that are made that do not have direct contact with humans in the way such things as cars, eyeglasses or shoes do. However, even seemingly disconnected or isolated technologies are geared or designed with perceptual needs at root. Take an electrical transformer, for instance. Though we cannot directly use nor do much of anything with a transformer in and of itself the transformer is part of a larger system that we are able, though perhaps only with education and training, to understand, manipulate and use.

Our instinctual evaluation of whether or not a technology functions effectively or "works," is based directly within our perceptual needs. This becomes apparent if we try

and think of a technology that would not meet our perceptual needs. Since perceptual needs are derivative of our active body and its poise in respect to objects in the world, if we imagine a sentient being whose active body is significantly different than ours, then we might see how a technology could be created that did not meet our perceptual needs. Let us imagine, then, a creature that is able to see nothing of the light spectrum that we can but instead can only see low range ultraviolet light. If this creature created a set of eyeglasses it would, we could assume, augment its eyes, however it may be structured, to be able to see ultraviolet light more clearly. If we were to happen upon these glasses they would be, in essence, meaningless to us.⁶⁷ They would not work, as it were, because they would not meet our perceptual needs. In other words, they would be ineffective in allowing us to make objects around us determinable. If we were going to “fix” the glasses we would have to, in one way or another, translate the information they generate into something perceivable.⁶⁸

⁶⁷ In actuality it would be impossible to imagine something truly outside the constraints of perceptual needs. Todes speaks to this on page 61-62 when he speaks of antifacts. It also must be recognized that we imaginatively create all kinds of situations, beings, and worlds where things are vastly different from the day to day world we experience; Star Trek, Blade Runner, Lord of the Rings etc. However, when these kinds of contexts are imagined it is our ability creatively to ‘place’ ourselves in the hypothetically functional world that allows them to work. We are not imagining contexts that are outside our perceptual needs; rather, we are imagining our perceptual needs in contexts different than normal, but still within perceptual constraints.

⁶⁸ This kind of translating is relatively common. Along the lines of the example many of the sensory readings from satellites and other probes are compiled by a computer and then translated into an image. The raw data is in effect meaningless until it is put into a structure that we are able to perceive. If a bat could make technology we would not be able to understand it.

Conclusion

The question stated at the beginning of the paper was this: “how might technology shape and reshape the way we come to know and experience the world?” How we answer this question will depend to a large degree on how we believe we come to know the world in the first place, that is, what kind of epistemology we hold to. We began with an explication of the phenomenological and epistemological position of Samuel Todes. Todes demonstrates that there is such a thing as non-conceptual knowledge, namely, perceptual knowledge. We come to perceptual knowledge of the world and objects in it through our active body and its poise. Poise is the anticipatory stance we have in respect to a particular object within a context. The context and the objects within it are derivative of the active body, meaning, they are a field within fields centered on the percipient. Our perceptual needs are the constraining range of contexts that we are able to respond to. To answer the question above we next need to turn to technology and see how it is able to influence this process. We have seen that technological objects are unique kinds of objects. Unlike natural objects that we come to know, technological objects are created, shaped and designed by us within a social context. However, once we have created the technological object it becomes an object in the world. As an object in the world we encounter it in the same way as we would other objects; we perceive and engage it through our active bodies. This unique position of technology instantiates an intentional arc between us, as a community of users, and the technologies we, as members of that community, create. An essential aspect of this intentional arc is the exemplar character that certain technologies can take on within our epistemic and

phenomenological worlds, which are embedded in the larger technological society. An exemplar technology is one that has strong influence over our perceptual and conceptual knowledge. The other side of the intentional arc is our perceptual needs. In fashioning technology we do so within those constraints.

One of the consequences of this view is that technology cannot be either fully understood or explained based on a purely conceptual epistemological model. Since many of the attempts to understand technology have approached the issue by developing conceptual definitions of technology the view presented here varies in some significant ways from those. Rather than focusing on categorization or definition the focus here has been on where it is that we, as social human subjects, encounter technology.

Technologies as objects in the world must be engaged through the skillful coping of our poise. Over time and within our social context certain technologies take on the role of exemplar technologies. Approaching technology from this position should help to explain why it is that technology so significantly impacts our lives.

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Appendix

TABLE OF PERCEPTUAL CATEGORIES⁶⁹

I. QUANTITY

- (1) Unity, of need.
- 0 (2) Plurality, skillfully co-ordinated.
- + (3) Totality, of plurality integrated in a unity of satisfaction.

II. QUALITY

- (1) Deprivation.
- 0 (2) Anticipation and Response.
- + (3) Satisfaction.

III. RELATION TO OBJECT

- (1) Lack of object.
- 0 (2) (a) Anticipation of *determinable* object (Primary Substance).
- (b) Responsive *determining* of object (Primary Perceptual Cause).
- + (3) Reciprocity, between percipient and *determinate* object of whose state percipient is satisfied.

IV. MODALITY

- (1) Lack of possibility. Lack of evidence for possibility of satisfaction. Action prompted merely by need.
- 0 (2) Real possibility. Evidence that possible satisfaction may or may not be realized.
- + (3) Necessity. Evidence necessitates belief in actual satisfaction.

⁶⁹ Todes, p.219.