An investigation of the arts as cognitive prosthesis.

by

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1. INTRODUCTION

When Sigmund Freud proclaimed the god-like magnificence of man in 1930, despite the intended grandiosity of his statement, he was yet perhaps unaware of the great scope which this pronouncement would later encapsulate. "Man," Freud (1930:91) asserts, "has, as it were, become a kind of prosthetic God. When he puts on all his auxiliary organs he is truly magnificent; but those organs have not grown on to him and they still give him much trouble at times. Nevertheless, he is entitled to console himself with the thought that this development will not come to an end precisely with the year 1930 a.d. Future ages will bring with them new and probably unimaginably great advances in this field of civilization and will increase man's likeness to God still more."

In view of the discourse on prosthesis which Freud's famous proclamation facilitates, this paper broadly examines the exceptional ways in which the posthuman, as an embodiment of technological intrusions, is complicated via the professional fine arts practice of technologically enabled social realities. In a critical engagement with this topic, this paper investigates how particular theoretical preoccupations with posthuman embodiment, as enabled by the prosthetic trope, provide a promising perspective from which artworks may be analysed.

In the first chapter of this argument, a brief introduction to the historical development of material prostheses is described. In historically locating the term prosthesis, the theoretical dimension of prosthesis is outlined and the philosophical implications of such a dialogue are explored. Here, prosthesis, as enabled by technology, is identified as a point of enquiry from which a critical interrogation of embodiment may be pursued.

In a closer examination of this socio-historical trajectory of technological, psychological and philosophical developments, this argument postulates that visual images, particularly those dialogic vehicles of the professional fine arts practice, have been systematically privileged as having the ability of reflecting, translating and aiding the psyche. Furthermore, this premise entails that this particular system of privileging is largely a modern development, and is thus symptomatic of preconceptions that modern visual technologies are inherently privileged in their ability to aid, reflect and translate the psyche. With such a privilege, visual images, particularly those contextualised by the artistic practice and its relationship with technology, act as what Lev Manovich (2006) terms 'cognitive prosthetics'. Here, the internal mental

processes of the human psyche are externalized as material forms, thus rendering these forms as extensions of both the body and embodiment.

Against this theoretical backdrop, the first chapter of this study analyses the artwork of Irene Naudé and Dan Graham as locations in which the theoretical politics of the representative prosthetic, as outlined above, are critically analysed. The artworks are thus deconstructed in terms of a conceptual engagement with prosthetic embodiment, in terms of its material significance as a cognitive prosthetic, and lastly in terms of its philosophical implications as a product of both these dimensions.

Chapter two, however, introduces the problematic inherent in the Cartesian polarization of external and internal on which the idea of cognitive prostheses is effectively based. The study then explores an antithesis in which the ramifications of cognitive prostheses are identified within a subtextual implementation of the Cartesian problematic. From this perspective, Katherine Hayles's (2002) assertion that embodiment is constructed via what she terms "the mindbody" is further complicated by theories on phenomenology, multi-sensory cognition[1] and relationism, which posit the body as a product of an interrelated flux of senses, mental processes, environments and contexts. The purpose of the second chapter is to therefore posit the privileging of cognition, on which the technologically enabled fine arts, as cognitive prostheses are chiefly based, as problematic. However, a possible resolution to such a problem is identified in new media artworks such as those of Lala Crafford, Jeppe Hein and Tom Friedman which articulate an artistic conceptualization of embodiment that does not privilege cognition.

In effect, this article employs the trope of prosthesis as a means of examining the politics of posthuman embodiment within an artistic context. Through a postulation of thesis and corresponding antithesis, the argument explores the promising implications in Freud's proclamation of man's prosthetic magnificence, as well as the possible discouraging implications of his caveat.

[1] Cognition here refers to certain mental processes in which information is received and interpreted. According to Judith Smith Koroscik (1984:33), a writer of cognitive processes in talking about art, "The study of cognition has produced theoretical models of human information processing… The first stage of processing involves the analysis of sensory or structural features of a stimulus (e.g., lines, angles, pitch, or brightness); the second involves the application of previously acquired knowledge in the interpretation of meanings that characterize semantic dimensions of stimuli (e.g., representational features, symbolism, etc.).

2. CHAPTER ONE

Prosthesis is a term originally conceived in early Greek and later introduced to English in 1553 as signifying the attachment or addition of a syllable to a word (Wills 1995:218). It has since been appropriated into medical and scientific practices as the process of attaching specialized machinery onto the body with the purpose of replacing the functions of a missing or amputated body part with the similarly configured mechanics of such machinery. In lay usage, prosthesis is the artificial supplementation of the fallible and incomplete body in order to restore it to its fully functional human form. Hannu Eerikäinen (2000), a Finnish author involved with prosthesis and the cyborg,[2] locates this functionalist conception of the prosthetic in Germany after World War I when thousands of German soldiers were left crippled by combat and restored to their able-bodied selves through the use of prostheses. "No longer embodying the military glory and pride of *Vaterland*," Eerikäinen (2000:55) describes, "but incarnating the instrumental logic of modern mechanical warfare reducing the body to a functionalized part of a rationally organized killing and destruction machinery, these German veterans were turned into living corpses" [emphasis in original]. In this sense, the prosthetic is a mere device defined by its enablement of survival, but one that is also inevitably imperfect in its perpetual inability of bridging the gap between present biological deficiency and former biological efficiency.

During the time between the first World War and contemporary theory, however, the prosthetic has assumed a set of philosophical implications which are considerably more promising than those crude connotations of its mere functional ineptitude as a substitution for biology. In scholarly usage, prosthesis has instead evolved into a standard around which an eager interrogation of bio-technological mergence occurs. Eerikäinen situates this transformation within a drastic cultural change, the nature of which oversaw a spur of enquiry across a range of disciplines. The cross-over into modern culture, in other words, not only provoked an investigation into new mechanical, scientific and medical innovations, but also an investigation into the philosophical and theoretical prospects these innovations entailed. "What we here have is, in the configuration of what I call post-theory," Eerikäinen (2000:58)

[2] A cyborg, linguistic derivation of the words 'cybernetic organism' is described by Donna Haraway (1985:191) as a "hybrid of machine and organism, a creature of social reality as well as a creature of fiction."

asserts, "a *jouissance* of ecstatic theory-language engendered by a theory futurism fascinated by the technological" [emphasis in original].

Eerikäinen (2000:59) thus maintains that through a theoretical transformation into a postmodernist reality that is constructed by social ideologies and determined by theoretical language, the "prosthesis has turned from a mechanical aid of the working body into a supplement of a postmodern theory body, into an object of libidinal fantasies." In this signified reality, the prosthesis is not confined to the mere enablement of bodily restoration or biological survival any longer, but instead imbued with the technological power of bodily transcendence.

Prosthesis therefore becomes a theoretical dialogue in which the limitations and boundaries of the biological human body is investigated and, more importantly, challenged in view of a now possible and alluringly superior posthuman[3] embodiment. In its early conception, such a form of embodiment, reaching far beyond the material confines of the mechanical arm or leg, provided a modern topic of interest that was controversial as it was exciting – an attitude aptly summarized in Sigmund Freud's (1930) famous speculation on man's attainment of godlike magnificence through prosthesis.

Regardless of such a proclamation, a theoretical enquiry into prosthesis that contemplates the finer points of connection between technology and biological bodies are, for the purposes of this investigation, more relevant than the daydream of man's supposedly divine splendour. These enquiries employ prosthesis as a point of departure from which a dialogue of what constitutes embodiment, as well as what embodiment implies, may be critically pursued. Embodiment, in this sense, incorporates both a material aspect as well as an abstract, immaterial dimension. Marquard Smith and Joanne Morra (2006:3), theorists who are concerned with the theoretical subject matter of the prosthetic, include in their work authors that specifically "work toward a dialectical materialism and a dialectical *im*materialism where identity, embodiment, consciousness, perception, and memory have been and are lived out inelegantly in an age of science, technology and information" [emphasis in original].

[3] Posthumanism describes an interdisciplinary concern with a human condition that is distinguished by a state of technological supplementation and a evolved consciousness which has surpassed humanism "since many widely accepted humanist ideas about consciousness can no longer be sustained" (Pepperell 2003:iii).

In its aforementioned dialectical immaterialism, which does not necessarily denote a mere metaphorical usage but also a literal one, the prosthetic is posited in a way which proposes, as Marquard Smith and Joanne Morra (2006:9) assert, "a way of interrogating the notion that an isomorphic relationship exists between the subject's internal world and its external projection. "In this sense, Smith and Morra determine how systems of representation function within the particular context of the prosthetic discourse, thus investigating how discussions of embodiment and the body extend well beyond their conventional forms.

From this perspective, theorists such as Joanne Morra and Lev Manovich (2006) extend the theoretical study on prosthesis in a language that surpasses the common posthumanist trope of the prosthetically enhanced cyborg with which Freud was so enamoured. Instead, these theorists attempt the prosthetic language with a much less conventional vocabulary wherein external expressions of interiority (as represented in language or the visual arts) are themselves viewed as prosthesis. Here, not only the body, but embodiment far exceeds its original confines. Therefore, as a material manifestation of interiority, representation is considered as a sort of prosthetic of human embodiment.

In an article particularly examining artistic representations in the vocabulary of the immaterial prosthetic, Joanne Morra (2006:266) examines Jacques Derrida's theories on the graphic trace and how "it aims to repress the question of materiality." Morra thus applies these theories to the artistic representation of Robert Rauschenberg's *Drawings for Dante's Inferno* (1958 - 1960) in response to Derrida's repression of the visual by articulating the materiality of artistic representation as evidence of the psychic trace. "In effect then," Morra (2006:266) maintains, "I am positing an analogy between debates within prosthesis (material versus philosophical) and the way in which a work of art (as a prosthesis) and its process of making (as both material and theoretical) can enable a new way of considering this contested arena within debates on prosthesis."

What Morra's article effectively introduces, for the purposes of this argument, are the implications of the graphically representable psyche, particularly its graphic representability through artistic texts. It is thus notable that the dialogue of the professional fine arts practice has, often unquestioningly, been accorded prominence in its function of adequately interpreting or aiding the human psyche. From this perspective, the fine arts are attributed an

incontrovertible association with cognitive processes, in which the visual is uniquely defined as a language or symbol system. In determining the value and implication of such a definition, Michael J. Parsons (1998:105) states that the "symbol systems approach to cognition identifies the different arts as each being a different symbol system, and thinking in the arts as processing, or conducting operations on, the symbols of one of these systems. This establishes the arts as cognitive. It also establishes them as unique because each art medium is a different symbol system, and therefore thinking within each symbol system is a unique kind of thinking."

Such a function reached a height of popularity in artistic engagements with Modernism.[4] Rather than their aesthetic constitution, the basis of merit upon which their artistic value is measured is somewhat relocated to the process and product of their conceptual content. In opposition, formalists such as Clive Bell and Noel Carroll reject such a means of evaluated and instead assert that, according to Carroll (1985:335), "before a work of art gets further credit for its moral or intellectual worth, it must have…the capacity to support some amount of artistic interest through the possession, as formalism urges, of certain structural, organizational and aesthetic properties."

Notably, the larger canon of the fine arts has never, like the formalists, utterly rejected the attitude that an artwork's conceptual substance should factor into its overall merit – a detail clearly exemplified further on. In effect, this would be to ignore the prominent role of cognition in the visual arts on which it is effectively based. Nonetheless, the artistic dialogue has still maintained the preconception of its privileged ability in sufficiently being able to translate the conceptual through visual representation. This attitude is adequately reflected in substantial artistic tropes and styles which, as already mentioned, began an ascent at the forefront of Modernism. Here, experimentation of the graphic as psychological representation is prevalent in artistic movements such as Surrealism, Abstract Expressionism, Conceptual Art and Dadaism.

[4] Modernism, a specific period of cultural ideas pre-dating postmodernism and loosely associated with the 'modern', is described by Charles Harrison (1992:143) as a term "used to refer to the distinguishing characteristics of Western culture from the mid-nineteenth century until at least the mid-twentieth: a culture in which processes of industrialization and urbanization are conceived of as the principal mechanisms of transformation in human experience."

In the writing of Charles Harrison, one may trace the development of Modernist painting from mainly European Cubist concerns in "the relations which obtain between the real world of three dimensions and the essentially illusory, two-dimensional world of the canvas" (2003:170) toward an existentialist concern in Abstract Expressionist painting. For example, Jackson Pollock's interest in, as Charles Harrison (2003:175) notes, "Jungian rather than Freudian view of 'unconscious', 'subconscious' or 'preconscious' imagery," was reflected in the imagery of his earlier artwork which later progressed into processes of Abstract Expressionist painting. In critique of these processes, Harrison (2003:178) maintains that, "…Pollock seems to have found the actual procedure of paint application increasingly expressive; not a means of depicting [the pictorial], but the actual means to mimetic life, within the painting, of the significance which the depicted form was to have embodied." Here, the attempted translation, enablement and aid of the psyche through the graphic are evident. Clement Greenberg's explanation of the typically Modernist preoccupation with abstracted forms over naturalistic subject matter is thus relevant in identifying the relocation of the conceptual from pictorial representation to abstract representation. "It is true that [technical] skill used to be a vessel of inspiration…," Greenberg (1981:768) maintains, "but that was when the best pictorial art was the most naturalistic pictorial art." In contrast therefore, for the Modernists, the best pictorial art is the art of abstraction notably because it is the purest embodiment of the conceptual.

For the Surrealist artists, the intriguing notion of tapping into the psyche via the graphic was also a major motivation. In his trace of Dadaist art to Surrealist art, John G. Frey, author of 'From Dada to Surrealism', claims that the rebellious Dadaist venture into deliberately illogical, random, spontaneous and unreal art forms against the regulated conformity of traditional artistic standards provided an aesthetic foundation on which Surrealist art was later built. "The means of organizing this system," Frey (1936:13) writes, "were provided by the recent discoveries of psychoanalysis[5], which drew attention to the powerful irrational forces that motivate action, that emerge spontaneously in automatic writing and the ravings of the insane, and that produce rare and mysterious images which are devoid of any resemblance to reality." The view that the novel products of such spontaneity were graphic evidence of the

[5] Psychoanalysis in film employs the Freudian method of interpreting the psyche in order to uncover the latent psychological content within it. Psychoanalysis in film draws an analysis between dreams and films where dreams many "contributions drawing on psychology, aesthetics and sociology have been relevant to the establishment of the dream metaphor" (Rascaroli 2:2002).

mysterious workings of an underlying conscience further emphasized the privileged association of the artistic image with the psyche.

This emphasis further contributed to the conceptual and psychological aspects of the arts, such as those prevalent in psychic automotive drawing, collage and Conceptual Art[6] that was produced at the time. Although these approaches to the visual arts are not altogether unproblematic, they nevertheless reflect the somewhat Modernist subjection of the visual arts to the purpose of sufficiently representing the psyche. In this sense of expressing interiority, the visual fine arts practice is therefore an extension of human embodiment, accordingly acting as a prosthetic to the material human body in an external and material form.

In his writing, Lev Manovich further elaborates on the represented prosthetic with an approach differing from that of Joanne Morra's. Here, Manovich particularly locates the conception of the graphic prosthetic within the development of what he describes as "early modern" visual technologies which "were (or are) thought to help our cognition" (Manovich 2006:203). In this argument, Manovich briefly draws on a history of the cognitive prosthetic, situating its conception within the nineteenth century where attempts to externalize the mind manifested itself in two ways. "On the one hand," Manovich (2006:205) explains, "we witness recurrent claims by the users of new visual technologies (from [Sir Francis] Galton to Jaron Lanier) that these technologies externalize and objectify the mind. On the other hand, modern psychological theories of the mind (from Freud to cognitive psychology) also equate mental processes with external, technologically generated visual forms." Therefore, the idea that modern visual technologies are able to objectify the mind is closely related to the framework of psychological theory of the time, the nature of which chiefly contributed to such a notion.

Manovich's particular emphasis of the modern era, the meanings of which are unpacked below, is significant, as it coheres with the aforementioned trends, styles and concerns of the Modernist arts, the likes of which were largely cultivated around an active pursuit of the

[6] Conceptual Art, an artistic trend or art style refers to artworks especially concerned with the conceptualized ideology of artworks instead of the material or aesthetic product of the artwork. "Confronting the full range of the implications of [Marcel] Duchamp's legacy for the first time, Conceptual practices, furthermore, reflected upon the construction and the role (or the death) of the author just as much as they redefined the conditions of receivership and the role of the spectator. Thus they performed the postwar period's most rigorous investigation of the conventions of pictorial and sculptural representation and a critique of the traditional paradigms of visuality" (Buchloh 1990:107).

graphically representable psyche. The reason for this precise historical placement, Manovich (2006:205) explains, arises from the "demand of modern mass society for standardization." The sudden accommodation of a rapidly populated modern world, therefore, demanded that a more efficient approach of deducing and controlling large amounts of information be employed through generalization. The composite photographs of statistician Sir Francis Galton, as an example specified by Manovich, aided Galton's theories on eugenics[7] by producing supposed averages of human facial features through the successive registration and exposure of various portraits onto a single plate. "The subjects have to be standardized," Manovich (2006:205) explains, "and the means by which they are standardized needs to be standardized as well – hence the objectification of internal, private mental processes and their equation with external visual forms that can be easily manipulated, mass produced and standardized on their own. The private and the individual are translated into the public and become regulated."

This theory on modern mass regulation is largely supported and contextualised by other influential studies on modern metropolitan living, particularly the influential text The 'Metropolis and Mental Life' by sociologist Georg Simmel. In this text, Simmel maintains that the translation of the rural mind to an actively calculating modern one requires that all qualitative values are reduced to quantitative terms. "The calculating exactness of practical life," Simmel (1903:13) asserts, "which has resulted from a money economy corresponds to the ideal of natural science, namely that of transforming the world into an arithmetical problem and of fixing every one of its parts in a mathematical formula."

In view of Galton's use of photography as an objective and standardizing means of externalizing the mind within the modern context illustrated by Simmel, Manovich investigates the dimension of psychoanalysis in film as a crucial means through which the modern visual technology of film was conceived as an objective means of externalizing ideas. Here Manovich emphasizes how the functions of psychoanalysis in film posit analogies between film and mental processes, thus privileging instruments of modern visual technology with an ability to objectively reflect and aid the human psyche. In accordance, the human

[7] Galton's scientific developments on eugenics entails attempts to 'improve' human biology through the identification and consequent 'filtering out' of 'fallible' genes which regularly occurs within the consistency of genes in races. "The aim of eugenics," Galton (1904:2) asserts, "is to represent each class or sect by its best specimens; that done, to leave them to work out their common civilization in their own way."

psyche is again extended through an external and material source, but in this case, one that is importantly also of a technological nature.

Evidently, this is sufficiently reflected in psychoanalytical theory on film. In determining the impact of psychoanalysis on American cinema, Glen O. Gabbard (2001:237) sustains that the first seriously applied psychology to the study of film by Harvard psychologist Hugo Munsterberg in 1916 argued that photoplay "can more or less replicate the mechanisms of the mind in a way that is more convincing than typical narrative forms in storytelling." This is elaborated on by Laura Rascaroli (2002:1) who illustrates how Francesco Casetti identified two relevant psychoanalytical methods with which the study of cinema should be approached: "First, the analyses which tend to uncover the latent content of a film, read as symptom or dream, and used as a basis to analyse the filmmaker's unconscious mind; second, the psychoanalytical investigation of certain aspects of film and the cinematic apparatus, for instance the psychological mechanisms which are at play in the viewing process. "In examining the work of Stanley Kubrick from a psychoanalytic perspective, Geoffrey Cocks draws a comparison between psychoanalysis and film. "Both are artefacts of the scientific and industrial age, Cocks (2003:35) maintains. "Both are concerned with what the mind sees. Both treat time as highly malleable and the unconscious as timeless. Both are concerned with tangible reality - psychological and photographic – but both are also vitally concerned with the intangible." Evidently, these psychoanalytic assertions that describe cinema as a graphic tool of objective psychic representation sufficiently support Manovich's argument.

Additionally, Manovich (2006:207) sustains that the emphasis of Sergei Einstein, a pioneering Soviet Russian film director and film theorist, is particularly important to the conception of these assertions "because it reveals the historical connection between the desire to externalize the mind and the rise of mass communication, of which film was a major vehicle." The significance of Einstein, that Manovich emphasizes, exists in his influential use of film as a vehicle for a largely uneducated Russian audience through which political enlightenment was achieved. Such a use of film is apparent in his screen adaptation of Karl Marx's *Capital* (1867-1894), whose "radicalism lay in both the decision to visualize the abstract notions and logic of *Capital* and the method employed" (Manovich 2006:207). In this practice, Einstein developed an influential system of coding the content of film wherein the idea which Manovich terms "filmic reasoning" was developed. Filmic reasoning, a system of making meaning, encourages viewers to interpret film in a way that allows for a

dialogue between conflicting ideas (thesis and antithesis), but that inevitably results in a synthesis between them. Such a system thus enables a negotiation with the content of the film which it also simultaneously uses as a vehicle of hegemony. Significantly, it encourages the "brain [to] automatically execute cognitive operations of montage, thinking through images efficiently and effectively" (Manovich 2006:207).

Through this supposed thinking through images, film, the development of which is largely due to the modern developments of standardization through mass media, is systematically encoded as an external space capable of conducting and reflecting mental processes. Extended to other attitudes toward images, particularly toward the image culture of the visual arts, but yet still very much configured by its technological enablement, "these developments," as Manovich (2006:209) proclaims, "are symptoms of a single social imaginary at work – to make the mind more controllable by externalizing it and rendering it visible. "This idea effectively introduces a dialogue of prosthesis, such as the one on which this discussion is based, wherein technologically influenced artistic representations as embodiment, as well as technologically influenced artistic representations of embodiment, may be explored. This context enables a unique perspective from which the visual arts may be approached and critically interrogated.

From this perspective, an analysis of artworks may be carried out in two dimensions, with a dialogue facilitated between them. On the one hand, an artwork may be analysed in terms of its theoretical dimension in which a dialogue of prosthesis is conceptualized as conceptual content of the artwork. On the other hand, it may be analysed in terms of its externalized material form and as a physical artefact of psychological aid, reflection or translation, consequently acting as an extension of embodiment itself. In effect, the interaction between the results of these two investigations provides a promising angle from which artistic responses to the prosthetic debate may be deconstructed.

Photographic artworks by Irene Naudé, for example, are particularly encoded within such a framework and their implications are thus especially germane to such an argument. Theoretically supported by ideas such as Jacques Derrida's depiction of the psychic trace, Naudé makes use of various experimentations with the technological process of photography in order to posit an analogy between the transient, yet residual characters of both photography

and mental memory. Thus, she investigates the nature of photography as an embodiment of memory.

In her Phantom Limb series, Naudé uses the trope of prosthesis as a means of metaphorically referring to "the absence-presence of a stimulus, being the photograph, as an aid for memory" (Naudé 2008:60). Often using actual prostheses as photographic subject matter, Naudé represents ideas of extended embodiment through the photographic camera, as well as explores the idea that photographs, as extensions of photographers, are mediated by the various factors outside the seemingly objective photographic process in the way that perceived realities are subjectively digested by observers.

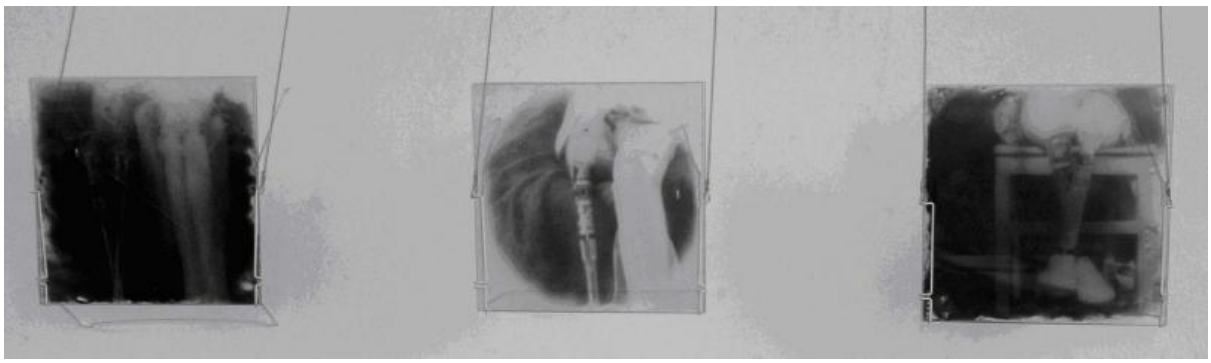

Figure 1: Irene Naudé, *Untitled*, 2006.
Pinhole photography printed on glass panes.
(Naudé 2008:64).

In *Untitled* (Figure 1), for instance, Naudé uses the delicate process of pinhole photography to represent the transient, yet residual nature of memory. "The understanding of light and the process involved in writing with light is a prerequisite in reading these variables correctly in order to create an image with this form of camera," Naudé (2008:63) argues. "The end result, in keeping with poststructuralism, bears merely the traces of the original moment." While the uniqueness and novelty of these glass panes which still bear the residual stain of the originally photographed image are clear references to the inimitable state of memory, they consequently also serve as embodiments of mental perception, acting as prostheses themselves. On the one hand, they serve as residual embodiments of the actual subject matter originally photographed by the artist, while on the other hand they are also embodiments of a theoretically framed conceptualization which Naudé encoded into the material artwork.

Figure 2: Irene Naudé, *Phantom Limb*, 2007.
Prosthetic limbs attached onto cameras.
(Naudé 2008:65).

Figure 3: Irene Naudé, *Phantom Limb*, 2007.
Prosthetic limbs attached onto cameras.
(Naudé 2008:65).

In *Phantom Limb* (Figures 2 and 3), Naudé mounts prostheses onto camera tripods and in doing so, directly engages with the theoretical framework of the prosthetic, as introduced above, by evoking an almost comparative interplay of the processes wherein our various subjectively embodied experiences are, in Naudé's terms, digested. "The process," Naudé (2008:65) maintains "functions as an allegory for the manner in which we 'read' each other from within the confines and safety of our own bodies."

In the case of *Cross Section* (Figure 4), Naudé mounted a spiralling sequence of photographically printed glass panes with each individual pane rotated a few degrees from the angled position of its predecessor. The resulting difference of angle between the first and farthest image is exactly 180 degrees. The two images, clear on the two panes of glass which are most further from each other, depict a human hand on one of the images and a prosthetic hand on the other, and conjoin as they gradually dissolve towards the centre of the spiral formation. This methodical structuring of the panes is intended to reflect the photographic process in which light travels in order to create an image.

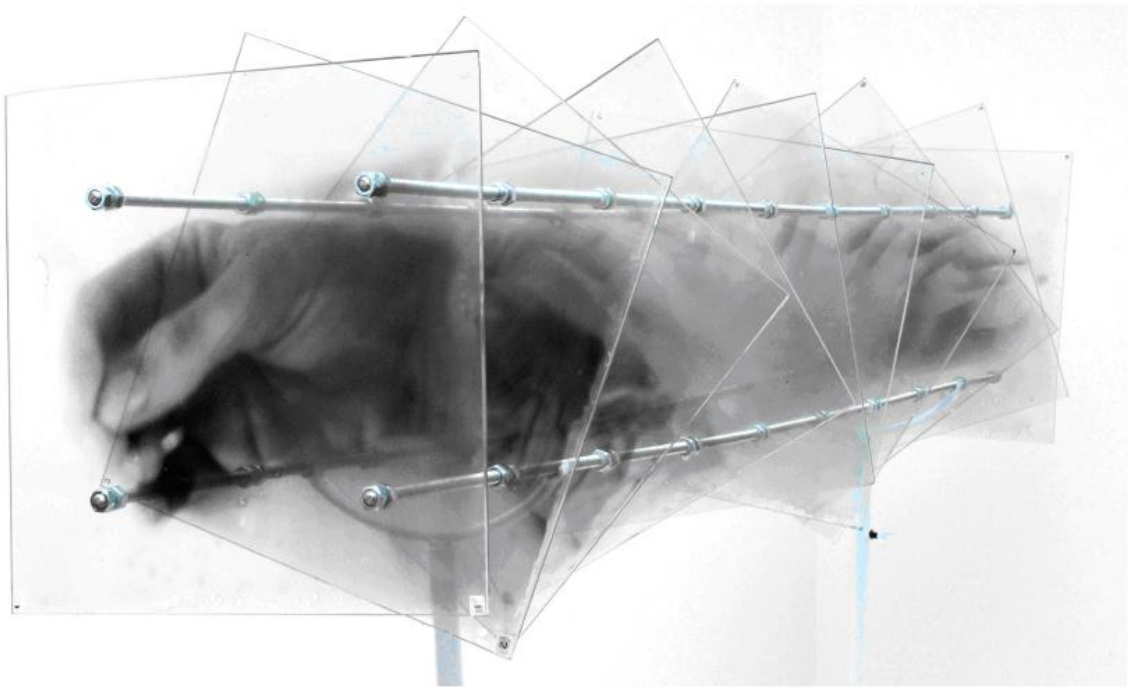

Figure 4: Irene Naudé, *Cross Section*, 2007.
Pinhole photography printed on panes of glass.
(Naudé 2008:67).

In doing so, *Cross Section*, like the rest of the *Phantom Limb* series, also engages the notion of Derrida's 'différénce' where transient present is only attainable through trace and residue. However, here the translation of subject matter from a biological hand into a prosthetic one is significant in a manner unlike the mere interplay of different types of embodiment present in the rest of Naudé's series of artworks. Not only does it metaphorically draw an analogy between the technologically supplemented posthuman and the biological human, but in doing so it also attempts the prosthetic dialogue in terms of what implies such forms of embodiment. Accordingly, the artworks merge and dissolve ideas of biological and artificial embodiment, while simultaneously positing this mergence as mediated through a reality which is relative and subjective in nature. This is constructed through the fragmentation of the images that form a sort of animated movement in its sequential arrangement of frames. In view of this, Naudé (2008:68) states that "the combined effect does not provide clarity and instead produces an intangible superimposition of imprints capturing forms, creating a fragmented [reality]."

This assertion of Naudé is significant. While it still maintains the assumption, like most products of the fine arts, that modern visual technology is able to adequately translate, reflect and aid mental processes, it does so from a perspective that projects this ability as always inevitably mediated by subjectivity. However, the analogy constantly drawn between bodies and cameras, and that of memories and photographs render Naudé's artwork as an archetypal example of both Morra's discussion of representation as prostheses, as well as Manovich's discussion of representative prostheses which are technologically enabled. Through the combined languages of both art and modern visual technologies as outlined previously, Naudé's work attempts to translate, aid and reflect the human psyche through material forms. Therefore, these externalized embodiments of conceptualization become representative prosthetics and thus, in their non-biological forms these technologically produced extensions of embodiment contribute to posthuman ideas of cyborg bodies in a largely unfamiliar dimension: that of cognitive representation.

Notably this framework of codes on which Naudé's work is based, though they are here contextualised in contemporary artwork, is not an entirely recent development within the professional fine arts practice. In fact, the strategies which the content and form of Naudé's artworks attempt are also present in the installations and art films produced by Dan Graham in the early 70's.

Bodypress (Figure 5), for example, is a filmed installation involving two filmmakers rotating inside the mirrored walls of a cylindrical room. The filmmakers are completely nude, except for the single handheld cameras positioned onto specific areas of their bodies with their hands. The rotations they perform are carefully synchronized. "One rotation," and online description depicts, "circumscribes the body's contour, spiralling slightly upward with the next turn. With successive rotations, the body surface areas are completely covered as a template by the back of the camera(s) until eye-level (view through camera's eyes) is reached; then a reverse mapping downward begins until the original starting point is reached." (Dan Graham [sa]) Once the cameras face each other, they exchange hands so that each filmmaker then handles the other's camera to film their previously held camera. "The cameras are of different size and mass. In the process, the performers are to concentrate on the coexistent, simultaneous identity of both cameras describing them and their body… Optically, the two cameras film the image reflected on the mirror which is the same surface as the box (and

lens) of the camera's five visible sides, the body of the performer, and (possibly) his eyes on the mirror (In projection what is seen by the spectator).” (Dan Graham [sa])

Figure 5: Dan Graham, *Bodypress*, 1970-1972.
Film installation of two synchronized silent 16mm-film projections.
Marian Goodman Gallery.
(Learning Embodiment from Film and Video Art 2007:[sa]).

In this careful choreography of turning bodies, filming cameras and exchanging hands, Graham attempts a projection of interrelated bodies, technologies and images which comment on embodiment, identity and the mass produced image in the rapidly evolving modern world of the 1970’s – a projection which is often subject to studies on artistic representations on subjectivity, modern visual media and the human body. “In this context,” Yolande Harris (2006:2), practitioner of the musical arts and author of the article ‘Inside-out instrument’, maintains, “one of the most prominent questions to ask as both audience and performers is where the instrument now lies in relation to the body, and how this previously solid duo has turned itself outwards into a weightless being as distributed and fragmented as the technology used?”

In the context of Graham’s *Bodypress*, the instrument of which Harris refers to is the camera which, in the case of *Bodypress*, lies in various relations to the body. In a material sense, the bodies of the cameras are particularly placed on various sections of the human bodies, thus allegorically acting as material prosthetics to the bodies and consequently enabling non-biological extensions of them. This is significant in two aspects. On the one hand, the cameras become technological augmentations of the physical human body, thus invoking the

trope of the cyborg with which the posthuman discourse partly deals. On the other hand, unlike mere machines with physical functions, because cameras have the function of visual representation, they conceptually augment the body through their function as a cognitive prosthetic. In this sense, the camera is an instrument historically attributed with the ability of being able to aid, translate and reflect the psyche – an ability which is notably visual in nature.

What is of even further significance is the play of subjectivity and objectivity within this context – a theme with which Graham intentionally deals. In her analysis of how artists employ mirrored reflections in order to deal with subjectivity and objectivity, Eileen R. Doyle (2004:92) writes that, "It is commonplace to note that, in the mirrors, viewers occupy the position of both subject and object. Some scholars use this fact as a springboard to claim that this perceptual synthesis leads to others, such as the synthesis of different media and of past and present." Graham's employment of mirrored reflections of the turning bodies with their cameras therefore construct a reality where the biological and filmic bodies are enmeshed and merged in the perceptual synthesis of subject and object.

What is also of note is the nature of Graham's choice of media and venue in order to project such a reality. In view of this, Doyle (2004:93) writes, "Where Graham appears to collapse subject and object in the works, he frequently does so within a public situation, analogous to the art and mass culture publications in which his art appeared, that emphasizes the social aspect of art viewing, thus underscoring the distance between the original positions of viewing subject and viewed object." Therefore, Graham's interplay of subjectivities and objectivities in his fragmented world of dissolving biological, technological and graphic entities are further complicated by the presence of viewing audiences in relation to the performers and vice versa. What is of particular significance, however, is that though subjectivity is portrayed, as is with the case of Naudé's *Phantom Limb* series, as a fragmented and elusive entity forever subject to mediation, the camera is concurrently portrayed as either a suitable means of translating such subjectivity or a component whose relevance in this whole milieu of codes is significant enough to feature within the artworks as a focal presence.

This is prominent in the filmed aspect of *Bodypress*, where the captured content filmed by the two performers is exhibited as part of the artwork. Here, only fragments of the installation are visible, with certain defining features of the filmed bodies implying clarity on what is seen.

The whirling vagueness of obfuscated and revealed imagery translates the selective perspectives of the two performers through film. While the comparison between the viewed performance and the indistinct filmed product suggest the mediated and selective nature of subjectivity, it notably does so by positing modern visual technology as an adequate means through which such subjectivity may be effectively translated. Furthermore, within the supposed objective realm of the installation, the cameras exist as extensions of the subjective performing identities, instead of somehow encoded as part of the supposedly objective installation.

Ultimately, the analogy drawn between subjective biological entities and cameras in opposition to an implied external and objective reality situates Graham's artwork directly within the dialogue of cognitive prosthesis. The method of obfuscation and revelation as employed to depict subjectivity of the performers in the produced films supports Manovich's assertions. "The recurrent claims that new visual technologies externalize and objectify reasoning and that they can be used to control or augment reasoning (that is, acting as prostheses)," Manovich (2006:209) maintains, "are based on the assumption of the isomorphism of mental representations and operations with external visual effects – such as dissolves, composite images and edited sequences."

On the same note Manovich (2006:209) significantly goes on to say that this assumption, "on closer examination seems to be highly problematic... The external images that are presented to the mind are not magically transplanted inside it as ready-made ideas and arguments. Regardless of what visual forms can be presented before the eye (diagrams, photographs, film ages), they are subjected to complicated processing by the nervous system, which constructs its own internal representations." The cognitive prosthetic is therefore problematic in its license of being able to objectively reflect the psyche and augment reasoning – a revelation which may imply myriad ramifications for, not only modern visual technologies, but also for the dialogic and philosophic function of the professional fine arts practice entirely. The problematic inherent in the privileged position the fine arts occupies in being able to reflect interiority and augment reasoning is the subject of Chapter Two.

3. CHAPTER TWO

In a publication entitled ‘Discourse on the Method and Meditations’ (1960), French philosopher René Descartes introduces certain theories pertinent to philosophical studies on space. Here, Descartes proposes a system he calls “methodological scepticism” where any idea of a doubtful nature should be rejected and re-established in order to acquire authentic knowledge. With his methodological scepticism, Descartes also establishes a distinction between the mind and body, where empirical experience, as declared exclusively accessible through the usage of sensory perception, is determined as intrinsically fallible. In view of this postulation, authentic knowledge may only be gained through mental processes which are exclusively restricted to the mind. In Cartesian claims, empirical space is a reality external to supposedly true internal human function, and intrinsically subject to misrepresentation when experienced through sensory perception. With philosophical developments on Cartesian theory as elaborated on by a scope of theorists, the Cartesian premises upon which binary oppositions are established, particularly the external/internal binary opposition with which this study is concerned, are drastically relocated.

A German scholar of various disciplines including that of mathematics, physics, philosophy, astronomy, optics and psychology, Edmund Husserl is most famously noted for his radical theories on Phenomenology, which significantly contribute to the destabilization of Cartesian polarization. In ‘Ideas: General Introduction to Pure Phenomenology’ (1962), Husserl introduces revolutionary theories on how humans function, theories that are further developed by theorists such as Martin Heidegger and Maurice Merleau-Ponty. Phenomenology, as an example of such a theory, considers relations with environments as integral aspects of human identity and critical gears in the process of cognitive operation. Furthermore, these relations serve to ultimately rebuke the Cartesian binary dualisms of subjective/objective, internal/external and body/mind by employing hermeneutic and semiotic systems of reality which establish the connection between the human being and space as an ideological system of social relations. Husserl’s phenomenology thus constitutes the groundwork for any philosophical engagement with space and any entailing elaboration on the posthuman condition discussed within it. Significantly asserting that space is as an important component in the constitution of human identity as the human body itself, Phenomenology thus liberates ideas of embodiment from its Cartesian confines.

A critic of postmodern literature, Katherine Hayles's involvement with pop cultural texts situates her within a critical exploration of such a posthuman condition. Approaching artistic, literary and philosophical audiences, Hayles engages with those phenomenological ideas on space as elaborated on by theorists such as sociologist Michel Foucault, where space as a social construct underlies most facets of the human condition. In the article 'Flesh and Metal: Reconfiguring the Mindbody in Virtual Environments' (2002), Hayles shows a rejection of those dualisms invoked by Cartesian theory. Instead, she investigates a specific milieu of embodiment where the clean Cartesian lines that easily distinguish the mind from the body are dissolved. Here, the interaction between the human being and its information-rich environment become mere ideological contexts by which humans are able to construct relations to the life-world in which they find themselves and in turn, construct.

Firstly, Hayles makes an important distinction between the body and embodiment. "The body," Hayles (2002:297) explains, "is the human form seen from the outside, from a cultural perspective striving to make representations that can stand in for bodies in general. Embodiment is experienced from the inside, from the feelings, emotions, and sensations that constitute the vibrant living textures of our lives…" Subsequently, Hayles then relocates these definitions of the body and embodiment by erasing the distinction between them. "…I argued that the erasure of embodiment characteristic of the history of cybernetics," Hayles (2002:298) asserts, "should not again be enacted as we move into the technoscientific formations I call the posthuman. Rather than beginning dualistically with body and embodiment, I propose instead to focus on the idea of relation and posit it as the dynamic flux from which both the body and embodiment emerge."

In this ideological framework of relation, the "mindbody" is thus adopted by Hayles (2002) to identify this new hybrid emergence of body and embodiment, consequently destabilizing the mind/body dualism of Cartesian theory and therefore significantly threatening the ideological system on which the cognitive prosthetic, as described in chapter one, is based. Within this context, cognition, as presupposed in Cartesian terms, is itself contested at a fundamental level. In this vein, Hayles (2002:302) concurs with Edwin Hutchins (1996) who argues in his writing that cognition is a cultural process, and a failure to realize this has resulted in the error of restricting cognition to the brain. Instead Hayles (2002:302) suggests that cognitive scientists "rather should have recognized that cognition is a systematic activity

distributed throughout the environment and actuated by a variety of factors, only some of which are human."

The grand error of the cognitive prosthetic, Hutchins (1996) suggests, lies in the failure to identify computational technologies as manipulators of preconceived social systems, instead of identifying them as primary architects of those systems. Computational technologies, therefore, are only intelligent in so far as human systems of symbols and according instructions on how to manipulate these symbols allow them to be. Without any such programming on how to manipulate these systems, these technologies are stripped of the illusion of autonomy, and reduced to nothing more than inanimate objects. While they manipulate these systems, however, the illusion of autonomy remains intact and subsequently threatens to replace human cognition. Hutchins (1996:363) explains how during the process of such a transfer, corporeal significance is misplaced.

> Having failed to notice that the central metaphor of the physical-symbol-system hypothesis captured the properties of a socio-cultural system rather than those of an individual mind, AI and information-processing psychology proposed some radical conceptual surgery for the modeled human. The brain was replaced with a computer. The surgery was a success. However, there was an apparently unintended side effect: the hands, the eyes, the ears, the nose, were removed and replaced with a computer. The surgery was a success. However, mouth, and all the emotions all fell away when the brain was replaced by a computer.

Hutchins's claims of the erroneous replacement of human cognition with the illusory intelligence of computational technology supports Manovich's argument in two key respects. Firstly, modern visual technologies as computational devices were and are thought of as able to aid, translate and reflect the human psyche. Secondly, such an assumption is problematic in its subtextual implementation of Cartesian polarization.

In a critical engagement with art as a cognitive experience, Ingar Brinck (2007) similarly points out that cognition isn't simply a mental function restricted to the brain, but that it is an embodied experience that is importantly dependent on context. "TSC[8] [or theory of situated cognition]," Brinck (2007:410) asserts, "states that cognition is 'active' in the sense that

[8] TSC or theory of situated cognition attempts a study of cognition as a contextualised phenomenon. Ingar Brinck (2007:409) accordingly elaborates that "according to TSC, perceptual processes are constructed in real time in the interaction between agent and environment."

cognitive processes emerge in concrete situations of physical action and socio-cultural practices." In this sense, art is always an embodied, and not just bodily, experience. It is also not motivated by reason or emotion exclusively, but by an intrinsically connected mergence of these two aspects.

However, Brinck (2007:409) also notably cautions against a privileging of vision in both the fine arts as well as in the approach of her study:

> Vision is given a prominent position in aesthetics, often dominating the other senses. The present approach is similar in this, but it should be stressed that hearing, touch, smell, and even taste all are implicated in perceptual processing. The vision system in the brain is linked to the other sensory systems, which permits interaction at an early processing stage. At a later stage, visual information is integrated with other kinds of sensory information to produce multimodal perceptual experiences and mental imagery.

In this statement, Brinck maintains that through an inherent interconnectedness, processes of vision cannot be entirely divorced from the influence or intrusion of the other senses – a claim which entails that cognition is therefore not only always a contextual and embodied experience of a multi-sensory nature, but also of an immaterial and ideological one.

While this contests Hutchins's presupposition that cognition is an inherently internal operation restricted to the mind, it agrees with his view that the Cartesian attitude in the presupposed ability of the mind to be transferred from one body to another, as an autonomous entity, is problematic. This is in accordance with Manovich's argument, who emphasizes that the error of the visual prosthetic is an attempt to directly reflect the human psyche. The difficulty then lies in the idea that, in their greatly differing states, human mental processes as an autonomous entity primarily existing within the human body cannot be accurately replicated (not translated) as an object of art, visual technology or both, and in its artistic translation, critical information of experience is lost.

Significantly, Brinck's argument agrees with Hutchins's employment of the fine arts as a symbol system, instead of Manovich's straightforward assumption that the cognitive prosthetic is an attempt to directly transfer or replicate a certain state of being human. As a symbol system, the fine arts avoid some of the dire consequences Manovich's argument inadvertently envisages for it because in this case, the fine arts are emphasized as a symbolic

translation of psychological processes and not replications of them. In this manner, Hutchins's description of computational technologies as mere manipulators of symbol systems is in fact, more appropriately applicable to the fine arts practice. Hutchins identifies the error in this attitude as the mistaking of the symbol-manipulating capabilities of technology for the creation of such symbol systems. Likewise, the error of the cognitive prosthetic is better identified as the illusion that visual technology, the fine arts, or both, is a primary source of intelligence. Subsequently, when the process of translation to which the symbol systems of primary thought processes, visual representation of these processes, and technologically enabled visual representation of these processes are subjected is taken into account, Manovich's problematic of the technologically enabled cognitive prosthetic is considerably more complicated and perhaps harder to identify. Thus, in Manovich's terms, is the translation of mental conceptualisation from one symbol system of the human psyche to another of visual representation or technologically enabled visual representation inevitably erroneous? If so, this poses a threat to translations of any form whatsoever. If not, provided it be emphasized as a symbol system, the technologically enabled cognitive prosthetic provides an avenue of possibilities for both the prosthetic and posthumanist dialogues.

In terms of the latter, this discussion returns to Hannu Eerikäinen's 'configuration of post-theory' within which the prosthetic dialogue is, perhaps, now more clearly contextualised: "a *jouissance* of ecstatic theory-language engendered by a theory futurism fascinated by the technological" (HannuEerikäinen 2000:58) [emphasis in original]. Here, the "prosthesis has turned from a mechanical aid of the working body into a supplement of a postmodern theory body, into an object of libidinal fantasies" (HannuEerikäinen 2000:59). However, despite Eerikäinen's failure to directly commend such a transformation, the ideological conversion of the Cartesian body into a 'postmodern theory body' holds aspects of both promise and caution – aspects which are elaborated on by a number of relevant theorists.

Eugene Thacker (2003:87), as a prime example, describes the body-technology relationship in a somewhat asymmetrical model of the posthuman which "has provided a more or less linear narrative, whereby certain prevalent new research fields (computer science, cybernetics, and information technologies), through a logic of informatic essentialism, reinterpret the natural, biological body as information and then move on to incorporate all notions of materiality and body into an abstract, disembodied level of functionality based on some notion of consciousness or intelligence. "Through a process of encoding, recoding and

decoding of the human body through an interdisciplinary study on genetics and informatics, an effective translation of the human body into information takes place. This process, which Thacker refers to as 'biomedia', constructs an equality of form between biological flesh and data which marks, according to Thacker (2003:91), "one of the defining moments in the posthuman, allowing the necessity of material instantiation to give way to the mutability of computer code."

Moreover, in an exploration of the prosthetic as a space of supplementarity, Leonard J. Davis (2006) accordingly investigates the origin of genetics as it was first introduced by Gregor Mendel, but interestingly notes that "most people do not realize that Mendel's ideas were mathematical only and did not advance any clear notion of what genes were or how they worked… [and that in fact,] the 'realness' of the gene in current discourse is belied by the fact there is no locus – no 'there' there – for genes" (Davis 2006: 94-95). So in effect, "the prosthetic gene," according to Davis (2006:95), "is in fact an imaginary location that replaces the 'realness of physical features, hair colour, and so on." Even after the 1950's when James Watson and Francis Crick discovered the chemical structure of DNA in the form of the double helix, their discovery was conducted on the still unconfirmed presumption that the gene existed (Davis 2006:95). Davis (2006:96) thus explains the prosthetic function of the gene in both science and theoretical enquiry:

> "In other words, the gene was the prosthetic location for traits that were presumed to be real and verifiable – but that location had never been seen or even ascertained by any other means. The gene was a virtual prosthetic – a location like heaven that had to exist if there were a Christian god, as the gene had to exist if there were inheritable traits. The human body, as a construct, could not have an entirety and an identity if there were no addition, now called genetic that was the place of origin, the real place for being human, and for being a certain kind of human – whether Caucasian or Negroid or Semitic."

Acting as a prosthetic space in which existing ideologies of being human may be supplemented, corrected, decoded and recoded, the gene therefore enables an aspect of the prosthetic trope which brings into question not only the meaning of the supplemented, but also the meaning of the lack thereof. In this vein, Davis employs a dialect of genetics which Thacker does not: that as an essentially ambiguous and metaphoric space, genetics don't merely reduce the body to an objective and liberating framework of information, but act as a space in which a re-coding of ideology, which is always subject to symbol systems, take

place. Regardless, these arguments are both in accordance with Hutchins's stance, as they both assume that genetic codes as information are useful insofar as they reveal or manipulate pre-existing symbol systems but, unable to create these systems, remain unintelligent.

What is of particular note here is that in an application of the information sciences, M. J. Rosenberg (1983:xvii) treats the arts the same way.

> "The hope is to define and justify the view taken by applying to the arts the kind of understanding that the information sciences have successfully brought to a number of complex questions, a view that aims, without relaxing its rigour, to grasp the detail out of which complexity is built, in a way classical science does not readily permit, while using the methods of these new scientific fields, so peculiarly suited to it, to escape the vagueness, muddle, grandiloquence and other vices to which much that is written about - especially the theory of – art has so often shown itself susceptible."

This employment of informatics and science in an attempt to decode the meaning of the arts reveal a common ground with Thacker and Hutchins's arguments in which both humans and their artistic products are reduced to interpretable information and symbols.

Furthermore, in describing the arts as 'relational' in its dialogical function, Nicolas Bourriaud (2002) asserts that the artistic practice creates a space of freedom within the socially regulated 'arena of representational commerce'. Subsequently, an artwork carries with it the social responsibility of symbolic exchange, in which, through a manipulation of the symbols of cultural systems, meaning is created. "The exhibition," Bourriaud (2002:17) maintains, "is the special place where such momentary groupings occur, governed as they are by differing principles. And depending on the degree of participation required of the onlooker by the artist, along with the nature of the works and the models of sociability proposed and represented, an exhibition will give rise to a specific 'arena of exchange'. And this 'arena of exchange', must be judged on the basis of aesthetic criteria, in other words, by analysing the coherence of its form, and then the symbolic value of the 'world' it suggests to us, and of the image of human relations reflected by it. Within this social interstice, the artist must assume the symbolic models he shows. All representation (through contemporary art *models* more than it represents, and fits into the social fabric more than it draws inspiration therefrom)

refers to values that can be transposed into society. As a human activity based on commerce, art is at once the object and the subject of an ethic. And this all the more so because unlike other activities, *its sole function is to be exposed to this commerce*" [emphasis in original]. More than just information then, the artistic domain acts as a relational space of social transactions.

Similarly, Suzi Gablik (1992) also insists on the relational aspect of art through its emancipation from the Cartesian model. This emancipation, though no easy task, is necessary in order to free artistic narratives and traditions from the autonomy and selfhood of the isolated exhibition space. "To speak the end of a certain infrastructure of autonomous individualism – or what we have been calling Cartesian selfhood – is to threaten the historical and psychological foundations of modern aesthetic practice and modern art history," Gablik (1992:168) asserts, " which have been based on an ideal of competitive self-determining personalities. But increasingly there is an emptiness at the core of this ego-centered desire for autonomy, the cost of which has been a diminished sense of community, a loss of social commitments and a truncated ability to care about others." In the abolition of this Cartesian 'ego-centered autonomy', Gablik further proposes that the arts actively exchange its system structures and processes (such as the isolation of the framed, exhibition space) in favour of a more relational, collaborative and interactive approach of dialogue. In this way, a process of decoding, encoding and recoding cultural symbol systems may be more effectively negotiated – a process without which the function of art would be questionable.

Ultimately, like the gene and like language, the arts thus effectively function as a prosthetic space, not in which the internal Cartesian mind is given form through the materiality of externalized expression, but in which the encoded meaning of being human is subject to an ideological process of decoding, recoding, encoding, manipulation, supplementation, correction and substitution. Furthermore, in an implementation of Hayles's phenomenological "mindbody", Brinck's assertion of cognition as a multi-sensory and embodied experience as well as Bourriaud's relationism, the arts act as a cognitive prosthetic in a manner that rejects Cartesian polarization, though it still remains dangerously reminiscent of the Cartesian ocularcentrism on which it is primarily based. Though, as Brinck argues, this privileging of vision is always inevitably influenced by the other senses, her caution against this privileging should not go unacknowledged, as it remains ideologically embedded within the narratives, methods and traditions of Cartesian polarization.

Intentionally or unintentionally in response to such caution, artists have occasionally resorted to other methods of art-making which manage to somewhat destabilise Cartesian thought and thus contribute to the professional artistic practice in a manner suitable to the propositions offered by Gablik and Bourriaud. As a result of such methods, phenomenological 'land' art, 'landscape' art, 'sound' art and 'invisible' art are worthy examples of art which, in their emphasis of multi-sensory artistic experiences, do not perpetuate the ocularcentrism of Cartesian philosophy.

In the work of Lala Crafford as illustrated in Figure 6 for example, a multi-sensory experience of art is created by connecting certain electronics such as fans and lights to power sources in such a way that when turned on, the electronic connections cause the gadgets and appliances to emit sounds. When connected in unison, the range of connected appliances and gadgets create a harmonious composition of sound, light and shadows which are, to an extent, controlled by Crafford. When initiated, this new media installation of simple electronic household items immerses its audience into a multi-sensory experience of emphasized sound. By conducting this process, Crafford implements those theories of Hayles, Brinck, Gablik, Bourriaud and Husserl in order to facilitate a practice of art which does not employ the visual as a containment of the mind, but which instead enmeshes the body within its multi-sensory environment. "I often use sound within my installations and that is in order to enhance the multisensory experience of it," Crafford (2012) maintains. "I aim to create immersive environments or atmospheres with my audio-visual installations in order to question how the combination of sound and the visual enhance our conscious experiences of art."

Figure 6: Lala Crafford, *Untitled*, 2011.
Installation of electronically connected household appliances.
(Art Blog by Lala Crafford).

Alternatively, instead of emphasizing other senses other than vision, artists of 'invisible' artworks evoke a multi-sensory experience of art by completely eradicating any presence of the visual whatsoever. For example, in the artwork *Invisible Labyrinth* (Figure 7) by Jeppe Hein, visitors were provided with a pair of digital headphones and made to walk in an empty gallery space. The space, as they were informed, was structured into a labyrinth of invisible walls, in which a calibration of infrared technology, would cause the visitor's headphones to vibrate upon entering the labyrinth. During the exhibition, the space would be transformed from an empty gallery room into a maze of people carefully mapping out their invisible routes with no guidance except from the quiet tremors occasionally given off by their electronic headgear every time they collided with an 'invisible wall'.

Figure 7: Jeppe Hein, *Invisible Labyrinth*, 2005.
Interactive art piece of headphones, infrared technology and invisible walls.
(Cumming 2012:[sp]).

Much like the strategy behind a traditional roleplaying game, *Invisible Labyrinth* (Figures 8 and 9) relies on few aids in order to immerse its audience into a largely imaginative experience of navigating through space. These aids, however, are notably not of a major visual significance. Instead, through the 'negation' of the visible, the artwork forces its visitors to reference their non-visual senses in order to follow the rules of the artwork and thus make sense and meaning of it.

Figure 8: Tom Friedman, *A Curse*, 1992.
Cursed installation of objects and empty exhibition spaces.
(Cumming 2012:[sp]).

In a different vein, Tom Friedman's *A Curse* tests visitors by loading empty spaces and objects with information, thus emphasizing the ideology which informs the visual. By doing so, ideology is projected as a major source of significance for spaces and objects, and as a constituent of what they actually are. In the context of *A Curse*, Friedman hired a 'professional witch' to curse various blank white objects and empty spaces of an exhibition

space. “At the time he said he was thinking about ‘how one’s knowledge of the history behind something affects one’s thinking about that thing’.
And once you read how it was made, Friedman’s pedestal becomes a loaded object that tests the roles that belief and imagination play in our encounters with art” (Cumming 2012). In effect, *A Curse* strips exhibition spaces of the visual but also effectively retains the power of their ideological substance, subsequently undermining the significance of the visual, or at least destabilizing its authority. Thus, *A Curse* tests and dismantles the Cartesian assumption that the visual, as an adequate translation of the mind, is especially able to represent information, psychological processes or augment reasoning.

Figure 9: Tom Friedman, *A Curse*, 1992.
Cursed objects and empty exhibition spaces.
(Dorment 2012:[sp])

These examples adequately illustrate how an approach to the fine arts can be liberated from the problematic ocularcentric restrictions of Cartesian polarisation. However, they also manage to address certain aspects of visual culture which are not commonly as apparent as they when the source of visual culture, actual visuals, is actively negated. For instance, they bring into focus questions about what actually constitutes pictorial competence, and how

much of vision is actually necessary for such competence. Ultimately, as *A Curse* distinctly demonstrates, "pictorial competence does not constitute the ability to recognize what a picture represents" (Rollins 2001:20).

This assertion ushers this study once again to the idea of symbol systems, and Michael J. Parsons (1998:105) who states that the "symbol systems approach to cognition identifies the different arts as each being a different symbol system, and thinking in the arts as processing, or conducting operations on, the symbols of one of these systems. This establishes the arts as cognitive. It also establishes them as unique because each art medium is a different symbol system, and therefore thinking within each symbol system is a unique kind of thinking." Although the relevance in Manovich's argument that the Cartesian problematic inherent in the cognitive prosthetic, as discussed, cannot be discounted, the ultimate oversight in his argument resides in that the cognitive prosthetic, as it exists in modern visual technologies, the fine arts or both, functions as a different symbol system in each of these dimensions. When this is acknowledged, it is apparent that these systems cannot be interpreted or manipulated in the same way as any of the others. In this view, a system essentially based on vision, therefore, isn't entirely at risk, because it exists as a metaphoric space in which meaning is created – as a system of 'symbols'.

However, even this symbol systems approach is not altogether unproblematic, because what is further at stake here is how much crucial information is lost in the translation process between these symbol systems. In this sense, whether or not the human psyche can be adequately translated by a visual symbol system such as the fine arts at all, whether in Cartesian terms or not, is an aspect of this argument deserving of, perhaps, some speculation. In this context, D. N. Perkins (1983) thus draws on the possibility of such miscommunication in the idea of novice viewers, who are not familiar with the artistic symbol system, approaching an artwork:

> "[Novice viewers] recognize the cows and the trees, but not the style or the form. They register the anguish of a martyred saint but not the way the landscape echoes that anguish with dull oppressive colors. They see the energy of depicted action in a Delacroix, but not the equal energy in the brushstrokes of a Van Gogh. They literally do not perceive these features that carry much of the value and excitement art offers. The art in the art is invisible."

Regardless, the cognitive prosthetic, the representative prosthetic and the technologically enabled cognitive prosthetic, in both their problematic, unproblematic and favourable forms, are significant excerpts from a substantial language that is already well in practice. Subsequently, this particular attempt at the prosthetic discourse postulates the cognitive prosthetic, with all its politics, as an important point of enquiry from which the fine arts may extend its dialectical attempt at contemporary embodiment, and vice versa.

4. CONCLUSION

This study explores the notion that artistic products and practices, as externalizations of the mind, are cognitive prosthetics. It then investigates the implications of the cognitive prosthetic in two dimensions: its problematic implementation of Cartesian ocularcentrism and polarization which are further perpetuated by a historical culture surrounding modern visual technologies, and its emerging nature as a complex product of a contextual, multi-sensory and phenomenological flux of experience. In this latter dimension, theories complicating and dismantling the Cartesian problematic of the cognitive prosthetic are, as possible solutions to the Cartesian problematic, not without their own difficulties. Subsequently, the study also considers the symbol systems approach and how, in such an approach, visuality of the fine arts may yet be retained as a symbol system of ocularcentrism, though it may always expose the threat of its Cartesian tendencies.

In its concern with how artworks, as externalizations of interiority, act as representational or cognitive prosthetics of biological bodies, this study ultimately arrives somewhere at its original point of enquiry. An immaterial attempt at the prosthetic dialogue ultimately enables the cognitive prosthetic. However, in this dialogue the cognitive prosthetic is identified as problematic in the traditions and narratives of its historical conception and development. In the destabilization of such traditions and narratives, the cognitive prosthetic is redefined as a complex product of a contextual, multi-sensory and phenomenological flux of experience. In effect, this investigation of the politics and implications surrounding and entailing the cognitive prosthetic arrives somewhere at the point in which the prosthetic trope itself is enabled– at Hannu Eerikäinen's assessment of prosthesis as a "supplement of a postmodern theory body" and perhaps even as "an object of libidinal fantasies" (2000:58).

What is apparent, however, is that by carefully exercising a dialect between the prosthetic trope and the technologically enabled fine arts, a unique engagement with posthuman embodiment occurs. Like the various theoretical texts with which Joanne Morra and Marquard Smith (2006:6) are concerned, this study attends to the physical and metaphorical ways that the cognitive prosthetic flexes "the corporeal surface, the psyche, and the interior and exterior limits of the body" and assesses the "ways that these efforts to renegotiate discourses on 'the human' might attend to the edges between these material and immaterial surfaces and limits."

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