FEMINIST PRACTICE AND THE PROBLEM OF "OBJECTIVITY" Techniques of Observation for Communications Studies

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Short title:

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Abstract

The thesis examines the problems of the "observer" and "objectivity." I review Thomas Kuhn's concept of "paradigm shift" in order to access wider debates in the history and philosophy of science concerning epistemological development. I argue against traditional notions of "objectivity" and "rationality" that proceed to "naturalize" the binary opposition between the natural sciences and other intellectual pursuits. To make this argument I draw from feminist critics of science, including Sandra Harding, Evelyn Fox Keller, and Donna Haraway, who reconsider more palpable conceptions of "objectivity" and "rationality" for a feminist science project.

Jonathan Crary's revisionist, and non-linear approach to a history of vision and the modern observer suggests that feminist critiques of science represent an epistemological shift imperfectly constituted in the nineteenth century. In conclusion, I analyze Donna Haraway's multi-dimensional approach to cultural, and feminist theory as a visual metaphor that resonates with the nineteenth-century technology of the stereoscope.

Résumé

Cette thèse examine les problématiques liées aux notions d'"observateur" et d'"objectivité." Un compte-rendu du concept Kuhnien de "changement de paradigme" permet une ouverture sur des débats plus fondamentaux en histoire et philosophie des sciences concernant le développement épistémologique. J'offre une critique des notions traditionnelles d' "objectivité" et "rationalité" qui entreprennent de "naturaliser" de l'opposition binaire entre les sciences naturelles et les autres entreprises intellectuelles. Cet argument s'inspire de critiques féministes de la science, tel que Sandra Harding, Evelvn Fox Keller et Donna Haraway, qui réexaminent "objectivité" et "rationalité" sous une lumière plus concrète, dans l'optique du projet d'une science féministe.

L'approche non-linéaire et révisionniste de Jonathan Crary concernant l'histoire de la vision et de l'observateur moderne suggère que la critique féministes des sciences constitue un changement épistémologique qui s'est établi de façon imparfaite au cours du 19ième. En conclusion, j'aborde l'approche multidimensionnelle des théories culturelles et féministes de Donna Haraway comme une métaphore visuel qui s'accorde avec la technologie stéréoscopique du 19ième siècle.

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Introduction

How is it that we come to know what we know? We probe, observe, and describe, and then, make assumptions about the world. Seeing and understanding are causally intertwined. That is, visual production and discursive production come together, as if unproblematically, to make the world. But what are the "criteria" on which we base our knowledge claims? Objectivity? Value-neutrality? Legitimacy of the observing subject? Ideology? Nature? What are the processes at work in the making of observations? Here are the problems of the observer and "objectivity."

A discussion of these problems requires that one address the "situatedness" of the observer. In suggesting "situatedness," I would like to depart from ideological theories of representation, and to begin thinking about the observer in relation to a much larger picture: epistemological organization. This is not to diminish the relevance of ideology in observation; however, ideology-infused arguments maintain the potential to welcome contests of binary opposition, whereby the reinvention of ideological point of view in this process is problematic.

This thesis asks questions about the ongoing reorganization of epistemology in philosophical and intellectual history, and how this reorganization affects not

only the status of the observer, but also shapes the way in which the observer approaches methodology in investigation BV this I speak specifically to the generation of terms of reference for research. This engages a radical rethinking of objectivity-oriented analyses on one level, and on another, demands a responsibility in coming up with a palpable definition of "objectivity" that responds to contemporary research problems. Likewise, it involves asking what we propose to gain by "rational" approaches that have been passed on by Enlightenment philosophy. And finally, what du "rationality" and "objectivity" mean to late twentieth century critical practice when discourses of the "other," and selfreflexivity in methodology propose a turning away from traditional modes of analysis, and a turning toward method: that resonate with wider historical, cultural, and social forces at work?

In <u>The Structure of Scientific Revolutions</u>, Thomas Pulm questions an assumption of "rationality" in the sciences that rebukes subjectivity, and succeeds in setting scientific inquiry apart from other intellectual pursuits. As a historian and philosopher of science, he has concerned himself with the issue of subjectivity in scientific observation, and with the irrational tendencies at work in the production of scientific knowledge for the purpose of rethinking traditional patterns of epistemological development. Kuhn's most significant contribution in this regard is his use of the terms "paradigm"

and "paradigm shifts" to explain the processes of scientific revolutions. Thus, he challenges conceptions of science as progress-oriented, and derived from a constant flow of discovery, documentation, and revolution, to contend that science is very much susceptible to reinterpretation.

A Kuhnian perspective, therefore, suggests that scientific discovery is not outside the realm of history and culture. Natural science method, in comparison, has cultivated a position of privilege in which its own representations of the world are steeped in "true" and "false" claims. It is this cultivation of "privilege" that has allowed the natural sciences to "naturalize" their relationship to the physical world, and to other intellectual pursuits. On the contrary, this position of privilege as "truth"-teller has fictional ties. That is, scientific precedent is not "natural," but rather, produced.

Coming to terms with the not-so-natural inheritance of scientific inquiry engages the problem of how we perceive history and, how we make historical narrative. In order to critically assess assumptions of pre-determination and linearity, it is imperative that one ask questions about time in association with culture and history. How one perceives history and its movement is directly related to the issue of progress. To challenge a conception of history as the "natural" stringing together of great people and events, one must also attend to the problem of production of ways of

knowing, and ways of seeing: epistemology. I argue that history is not pre-determined, nor is it definitively the linear unfolding of narrative. Rather, it is driven by an ongoing reorganization of knowledge, and is, in this way, ultimately reinterpretive. History is not about time past; it is absolutely wrapped up in the present. In this respect, we make history based on our reflection backward upon events.

The status of the observer, therefore, is not constant and fixed, but rather, must continually be renegotiated. The observer is not outside the circuit of observation, looking down upon or out on the world from vantages of privilege. Rather she/he is deeply embedded in (and an accomplice to) shifts in actual technical, social, and cultural practice, and in this respect, is intensely "situated." How we make stories: and establish belief is related to how we look at things, both qualitatively and quantitatively. A capacity to situate knowledge claims on an active resistance depends to judgmentally relative perspectives. Judgmentally relative perspectives motivated by infinite mobility are and interchangeability that suggest the possibility for an omnipotent observer who sustains an empathetic desire to occupy the position of another. A commitment to situating knowledge claims, on the other hand, attempts to take a detour from this omnipotence.

With these ideas in mind, I propose to investigate the problem of the observer, and the seemingly simple issue of

"objectivity," which is in itself highly problematic. The theoretical lynchpins of this discussion are radical and feminist critiques of science. I have chosen to preface these critiques for it is to the natural sciences that the social sciences have looked in order to establish and legitimate patterns of research methodology. While my research question is specific to the discipline of communications, there are distinct points of overlap in methodology and purpose that cross disciplinary boundaries. I remind the reader that a history and philosophy of science is not necessarily the definitive origin of this kind of critique; rather, it is a methodoligical choice in the thesis to both observe and to challenge the rigour of these debates.

introduces issues of subjectivity, Chapter One irrationality, and history as these have been prefaced by Thomas Kuhn in The Structure of Scientific Revolutions. Kuhn's paradigmatic approach to the history and philosophy of science aptly guestions traditional narratives of science that represent themselves in terms of rationality, order, and progress. In importing qualitative analyses to scientific discovery, Kuhn has identified moments of discontinuity in scientific discovery that make fictional the separation of science-as-rational-pursuit from the arts-as-irrationalpursuits. His interrogation of the "naturalness" of this binary has suggested that there is perhaps a communicative relationship between the rational and irrational, or not-

rational, that allows one to reconsider the documentation of scientific discovery as a "poetic" and creative endeavour, as opposed to a rationally pre-determined one.

Thus he cites the growth of, and shift among "paradigms"--or ways of seeing--as conduits for scientific revolutions. In so doing, he challenges notions of order and of progress, and critiques a belief that the sciences are able to transcend subjectivity in order to reside in value-neutral spaces. This is not to argue that science is anarchic, disorderly, and chaotic without purpose, but rather that its pursuits and discoveries are not necessarily deliberate and pre-determined, but are quite possibly the fruits of accident. While his contributions appear to be dated, I argue that these contributions have continuing relevance for their importance in particularizing the movement of paradigm shifts. Secondly, his contributions are noteworthy since they have prepared a critical terrain for further discussion in the history and philosophy of science. In particular, Kuhn has been a pivotal point for feminist critiques of science to engage debates about objectivity and rationality for a feminist science project.

Chapter Two, then, takes a closer look at the rise of feminist criticism in the sciences and studies in epistemology. My argument is situated in the divide between feminist empiricist and feminist standpoint theories, with the purpose of providing background on, and accentuating the

salient differences among, the intellectual divisions in feminist circles. This chapter works with the ideas of feminist theorists Sandra Harding, Evelyn Fox Keller, Nancy Hartsock, and Donna Haraway to critique and reclaim notions of "objectivity" and "rationality" for a feminist science project. What these theorists are interested in is an approach to responsible research that not only questions methodological approaches, but also interrogates the very terms of reference on which research methodology is based: "objectivity" and "rationality." That is, they critique a quantitative and neutral bias in science by asking questions about the absence of gualitative criteria (subject position and gender for example) in order to return to a hybrid form of quantitative/qualitative discussions about "objectivity" and "rationality."

In particular, Sandra Harding and Donna Haraway are concerned with moving away from empirical approaches that claim equity in research based on an additive response to methodological categories (the importation of gender to analyses). At the same time, there is a danger implicit in replicating authoritative models by privileging essentialist alternatives. Harding and Haraway, whose epistemological perspectives I draw from at length in this thesis, are aware of this ideological switchback. What they propose is a discourse of hybridization such as the one I have suggested above. It is a discourse of science that is able to account

for a radical specificity of subject position in the observation process, and retain a sense of objectivity that is accountable, responsible, and "non-innocent." It is a delicate and complex proposal, yet a most necessary one if we want to do "good" research, and continue to raze foundations of whole "truth" in the research process.

Chapter Three blends Donna Haraway's notion of "situated knowledges" with historical research in the area of visual practice as discussed by Jonathan Crary in <u>Techniques of the</u> <u>Observer</u>. Using Crary's work and Haraway's essay, "Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective," I return to debates concerning the making of historical narrative and techniques of observation.

I evoke discussion of the camera obscura technology as "truth"-model that spanned nearly two hundred years from the sixteenth to eighteenth centuries, and the nineteenth-century technology of the stereoscope in order to challenge a linear conception of epistemological development. The camera obscura was a technology based on linear, point-to-point observational practice. In the nineteenth century, however, there is a break from this linearity in which investigations into optics and physiology combine with technical practice to suggest a shift in the status of the observer. The nineteenth-century observer, and this observer's techniques of vision, therefore, are not based on linear precedent, but rather, come to be identified as embedded in a variety of practices, including

technical, cultural, and historical. The stereoscope is an example of this shift in the technology of vision and in the techniques of the observer.

Donna Haraway shares with Jonathan Crary's historical analysis a parallel interest in coming to terms with visual technique. With art history as his entry point, Crary works to denaturalize the division between the "experimental" and the "real" in order to suggest that technical practice and artistic practice are not diametrically opposed, but, rather, are engaged in similar epistemological processes. In so doing, he argues that there remain unfettered pockets of subversion in nineteenth-century visual practice to suggest how vision has been imperfectly constituted, and without recourse to an Enlightenment sense of "rationality." He also suggests that this constitution is not restricted to aesthetic practice. I argue that the residues of this "imperfection" surface in twentieth-century feminist practice, specifically feminist critiques of science. Haraway's redefinition of "objectivity" for a feminist science project, one that emphasizes the partial and the incomplete in narrative, is one site of this subversion.

There is not one definitive story about the observer and the technical origins of the modern observer. The present research project challenges these notions of origin, "truth," and the authentication of "truth." It would appear that one of the main foci of traditional research methodology has been to

establish ways of seeing, and ways of knowing that are whole, and which take a quest for "truth" as their point of departure. I insist that our problem has never been to see fully. On the contrary, the greatest challenge for contemporary studies in epistemology is to see in part, to approach notions of "truth" that are partial and incomplete, yet not irresponsible.

Some of the clues to this "situatedness" of the observer and of partial perspective are embedded in our techniques of observation, and the technologies we employ. This is not to argue that epistemology is technologically determined; however, it is to suggest that we are not outside of our techniques of observation as neutral and unaffected bodies in this process. We are simultaneously products of our ways of seeing, and producers of ways of seeing. To engage in dialogue at this level requires that one actively consider historical, cultural, and social circumstances at work.

Chapter One Kuhnian Stories

Thomas Kuhn identifies "irrationality" and "subjectivity" as central to debates concerning a history of scientific discovery. He critiques a history of science whose knowledge claims assume a linear narrative of progress. I use the term "linear" to describe the way in which objects and methods of inquiry are sequentially related outside the realm of the knower, and how perception of objects and methods is conceived as a function of a direct line of vision. Attention to any overlap of cultural, historical, and social circumstances as relevant to the process of knowing and seeing is not an integral component of point-to-point processes. For Kuhn, on the contrary, shifts in structures of belief are at once relative to cultural formations, and are therefore influenced by sociological criteria that intervene in the scientist's pursuit of knowledge claims. This interference pattern includes the way in which scientific communities represent themselves according to professional affiliations, the dynamics of internal politics, and the various "languages" used to communicate ideas. Scientific revolution and changes in patterns of discovery, are therefore, not characterized by a "pure" and uninterrupted relationship between theory, experiment, and progress; rather, they are moved by the

interplay of a scientific community's social, cultural and historical limitations in breaking methodological thresholds.

Kuhn draws on psychology to explain perception as a problem. Influential shifts in scientific discovery, he argues, are made possible by "gestalt switch," a perceptual technique in which the observer experiences visual transformation based on the context of observation, including qualitative shifts between before and after conditions of the experiment.¹ The suggestive power of gestalt is not to demonstrate how the objective world alone changes for the observer, but that the observer, in visual collaboration with objective world, simultaneously engages the in the transformation of visual perspective. By including the "subject" in the circuit of observation, Kuhn is careful to make complex the recombination of social, cultural, and historical factors at work in perception, and the transformative potential of vision. In so doing, he questions the potency of scientific laws and standards that serve as "natural" guidelines for scientific processes, and leans toward the "irrational" and the "subjective" as possible patterns of interference in the quest for "pure" science.

"Irrationality" and "subjectivity," Kuhn's categorical

¹ Kuhn 1970a, 111. Kuhn describes gestalt switch in elementary terms to distinguish how individual observers will experience different visual effects when looking at the same image or experiment. The process of refining the visual effect is linked to the observer's location of subject position, which is in turn wrapped up in social circumstances, and, in the situation of the scientist, conditions of scientific training.

imperatives, present a challenge to rational and value-free standards that attempt to elucidate the development of scientific revolutions as an ordered activity. Comparatively, the significance of visual transformation through gestalt joins Kuhn's notion of a paradigm to incorporate overlapping and interdependent social, cultural, and historical circumstances and events that engage in paradigm production. In this respect, an awareness of shifts between paradigms, or world views, interrogates progress, rationality and order as things that are unnecessarily naturalized outside the social In this respect, "paradigm shift," Kuhn's most realm. important contribution, denotes an epistemological, or "paradigmatic," shift in its own right. That is, it has opened inquiry into the methodological terms of reference, most importantly the concept of "objectivity."

It is arguable that Kuhn's proposal for the structure of scientific revolutions takes a radically different course from traditional science history. He does not turn to "irrationality" in opposition to the rational, but rather attempts to accentuate difference in observational logic--the not-rational. By introducing subjectivity and the social formation of scientific communities, he drives his interrogation of progress and order through to question "value neutral" and "objectivity" as these terms pertain to scientific inquiry. In so doing, he focuses on the problem of whether or not "objectivity" can have an "eye," without an

"I." That is, to what extent does the "situatedness" of the observer as subject infiltrate the observation process, and therefore dilute the value-neutrality of this process."

Taking their cue from Kuhn's paradigmatic approach to scientific revolutions, feminist critics of science are rethinking traditional methodological techniques. Sensitive to both the necessity for scientific research and the problems wrought by traditional scientific approaches, they are committed to retaining some sense of "objectivity" and "rationality" for a feminist science project. Of particular concern to feminist critics is the notion of privileged perspective. They argue that objectivist science is not situated in the arena of neutral observation, and argue instead for a conception of perception and vision that is intensely subjective and embodied.³ In particular, Donna Haraway revises privileged perspective to argue that vision

² In particular I refer to the work of Sandra Harding and Donna Haraway whose ideas I develop in Chapters Two and Three of the thesis. Both Harding and Haraway are committed to a feminist "successor science" which takes its cues from a radical science movement but attempts to break ground in terms of a distinct, however not essential, feminist project.

^{&#}x27;On this point see Donna Haraway, "Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective." See also Sandra Harding, <u>The Science Question in</u> <u>Feminism</u>, Evelyn Fox Keller, "How gender matters, or why its so hard for us to count past two," and Sandra Harding, "How the women's movement benefits science: two views." The points raised here assess objectivity in light of the disenfranchised, "overessentialized" yet obfuscated category of the "other" in the sciences, and why it is so important to reconsider what we mean by objectivity, and scientific method. These ideas are elaborated in Chapter Two of the thesis.

(and likewise knowledge) is at once partial and situated, and by this she challenges notions of point-to-point visual perspective whereby visual technologies are simply prosthetic devices, and draws attention to multi-dimensionality in visual perspective.⁴

Kuhn's retention of a privileged position in hıs culturally, socially, and historically relative approach to paradigm shifts will be assessed in this chapter. That is, does he situate himself critically as a subject in the same history and philosophy of science that he critiques? How does this affect the validity of the term paradigm, and similarly, the significance of paradigm shifts? Does the concept of a paradigm shift represent a radical technique for narrating science history, or does it succumb to traditional modes of narration whereby paradigms are prostheses, as opposed to indicators of movement in an overall reorganization of knowledge and epistemology? Is Kuhn's relativism a viable alternative to empiricist and positivist methodologies, or simply a return to = notion of an omniscient observer? A key

¹ While Kuhn is careful to import cultural and social aspects to a history of scientific revolutions, it can be argued that he does not radically shift the terms of reference in his analysis, namely the way in which he positions the observer relative to other circumstances. Haraway challenges the empathetic drive of the observer, the drive to understand the position of the observed. She critiques the mechanical processes of interchangeability and mobility of the observer and calls for a radical specificity of our own subject positions as an alternative. In this way she draws attention to the dangers of relative positioning. I preface this argument in Chapter Three with specific reference to Haraway's essay, "Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective."

to sifting through this problem is in an examination of how Kuhn deals with the process of documenting history. These are a few questions and problems to be explored in this chapter.

This interrogation could be narrowed in scope as another critique of Kuhn; however, I ask these questions in order to consider to distil what Ι be the most significant contributions, and in effect, the most visionary aspect. of The Structure of Scientific Revolutions. In setting up this inquiry, I would like to prepare a methodology that incorporates some elements of a Kuhnian perspective, in particular his attempt to interrogate uni-linear, progressoriented accounts of history. In this respect, I rely on a conception of history that is backward-looking at the same time that it is oriented to the present.

I begin with an exploration of the many senses of "paradigm" used by Kuhn throughout the book, and look at how mapping the course of paradigm shifts is useful for thinking about the formulation of disciplinary ways of seeing-epistemology. Secondly, a general comparison of Kuhn and his critics, including ensuing debates on scientific method, will help to situate Kuhn as a subject in science history⁵.

⁵. See Thomas Kuhn's preface, "Logic of Discovery or Psychology of Research," in <u>Criticism and the Growth of Knowledge</u>. In particular Kuhn identifies shared points of overlap with Sir Karl Popper that hinge upon critiques of certain tenets of classical positivism. For example they both support the inseparability of theory and observation, share a scepticism toward the possibility of a neutral observation language, and both insist that scientists can aim to explain "reality" in terms of observed phenomenon. I argue that this latter proposition does not stray

Finally, I will conclude with insights inspired both by, and beyond Kuhn for how one might begin to contribute to visualizing history as a challenge to linear analyses, while remaining cognizant of how the writer might situate herself in this process. In this proposition for refiguring historical memory, I would like to begin to confront rationalist and relativist conceptions of "objectivity" for a strategy for communications methodology.

What is a Paradigm?

Margaret Masterman identifies twenty-one ways, some conflicting and others variations on the same theme, in which the term paradigm is used in Kuhn's work (Masterman 61-65). What is interesting about Kuhn's attempt to elucidate "paradigm" is his capacity to shift simultaneously contexts of meaning, which, Masterman concedes, presents the greatest difficulty in his work. Consequently, she does not challenge the validity of his evidence as "truth" claims, but instead finds it necessary to question its methodological contribution and likewise its priority in the history of science. This comes out best in the following questions:

Is there, philosophically speaking, anything definite or general about the notion of a paradigm which Kuhn is trying to make clear? Or is he just a historian-poet describing different happenings which have occurred in the course of the history of science, and referring to them all by using the same word,

from classical positivism at all, but instead supports it.

"paradigm"? (Masterman 65)

The problem that Masterman identifies is whether Kuhn is an epistemologist who historicizes philosophical shifts in ways of seeing, or if he succeeds only in narrating a history of method. Put another way, on the one hand he is in a position to influence the philosophical current of historicizing method in science, and on the other, contributes no more and no less to the narration of this history. How one situates Kuhn depends on how he positions himself in relation to this history of science. If we can find a place for Kuhn and his work in a history of scientific revolutions, that is, if he can be situated in terms of his own historical reflection, and an on going self-reflection, then one would have to see his contributions as part of an important philosophical moment. However, if one is unable to locate Kuhn and simultaneous self-reflection in the work, in which he is actually part of the machine in process, then Masterman's clever description as "historian-poet" might not be far off. I am inclined to believe that Kuhn is both of these, and that what one does with Kuhn's work, how one is creative with Kuhn's hypotheses, is what marks the difference between his value as either epistemologist or historian-poet.

Kuhn's critique is precisely to disarm objectivist arguments of neutrality and to acknowledge the poetics implicit in both performing and writing research. The base value of his approach is to encourage the historian of science

as story-teller, not one who describes what is there as events pre-determined by history, but one who reconstructs circumstances after the fact. Historical movements are derived after the event, and in this way we must decide if events take precedence over their history, or if in fact, events come to fruition in the production of historical analyses. That is, can there be an event without first a method of historicizing the event? This introduces the problem of how one explains what one sees and, indubitably, the problem of neutral, and likewise naturalized, objective analyses.

The Kuhnian Paradigm

Kuhn begins with a definition of paradigm as "universally recognized scientific achievements that for a time provide model problems and solutions to a community of practitioners" (1970a, viii). In this case, paradigm precedes the definition of a scientific community, such that both paradigm and scientific community are mutually determined. The result is paradigms that are defined in terms of their acceptance by a scientific community, and a scientific community that is defined in terms of its acceptance of a paradigm. Kuhn acknowledges the circularity of his argument and addresses this by forgoing the primacy of paradigm in favour of first and foremost isolating a scientific community. Thus, he defines scientific community with respect to qualitative evidence based on education, professional affiliations,

exposure to similar technical literature, and a language used by the community in scientific literature. However, Kuhn remains trapped by arguing that within the said "community" there are differing approaches to the study of scientific subject matter (1970a, 177). This circularity is polemical and raises the following question: how can we competently use terms such as "community", "culture", and even "paradigm" for that matter, without first interrogating the production of these terms of reference upon which our research depends. Again, this is an issue that is undeveloped in Kuhn's work, and one that Chapters Two and Three of the thesis attempt to address in more detail, specifically in terms of coming to terms with what we mean by a perceivably neutral concept such as "objectivity."

The question now shifts to asking how it differs to define a community first in terms of its various "approaches to scientific subject matter," secondly, by its acceptance of a "paradigm," or generally speaking, in terms of a "way of seeing" research problems. The difficulty does not arise in finding a definition for a community as much as it resides in dealing with larger concerns of "objectivity," and how one establishes a position of privilege in observation. The importance of paradigm, therefore, is not in its definitive context, nor is the importance of a scientific community wrapped up in one's ability to set parameters for it. Instead, our research questions should focus on "how" paradigms, as sets of observational practices and techniques, connect to other practices--social, historical, philosophical, technical--and how such a "network" contributes to paradigmatic development, and likewise how it contains the potential for overall epistemological shifts.

Is a paradigm an epistemology? When Aristotle and Galileo looked at swinging stones, for example, each observed different phenomena--Aristotle a constrained fall and Galileo a pendulum (Kuhn 1970a, 121). Kuhn is careful to argue that difference in perception between Aristotle, and centuries later Galileo, was not dependent upon a change in the phenomenological world, but rather, in retrospect, both philosophers "worked in a different world." The position of the observer in this instance is not one of innocence in which he/she transcends the physical world in order to look back upon it and describe it. Rather, being in a different world identifies an observer who both constitutes and is constituted by change. Paradigms are not prosthetic filters used to see the world differently; instead, they are constituted in connection with our situations in the world and engage with us as we produce the ways in which we "see" in the world. The organization of knowledge, therefore, is a terrain marked by bumps and fissures that present themselves as shifts in ways of seeing--normal science broken by crises in perception. Perception and paradigm shifts are entangled in a relay between the phenomenological and the epistemological in which

changes in phenomenon cannot be understood in isolation from an ongoing reorganization of knowledge.

Kuhn argues that these periods of "normal science" precede a crisis point, evidenced by the inability of a scientific method to serve and sustain the research interests of a community. What sustains a research community is not necessarily the common pursuit of knowledge, but the demands placed upon that community in order to legitimate a position of privilege. This is not to argue that research interests are exclusively ideological, based on institutional structure and peer approval; however, implicit in sustaining research interests are discourses, demographics, and trends which in combination bind a community. Returning to normal science, it is the period when existing knowledge and circumstances-institutional structure, discourse, methods--function to support the community's current interests. When progress and development narratives are not satisfied by existing parameters--Galileo's reinterpretation of the swinging stone-the community enters a period of crisis, which is also the period of discovery. At this point, the research terrain is vulnerable to a shift in research method. Crisis is curbed, and research resumes a "normal science" mode until the next inflicted upon the scientific crisis surfaces and is community.

It is unclear whether or not this is identified as an epistemological shift by Kuhn, or merely as a change in

techniques of observation. This is an important question for it forces one to reflect critically upon the concept of "progress," to assess how linear conceptions of history can be misleading, and to determine how breaking points lend themselves to the capture of alternative ways of seeing. In asking these kinds of questions, it is possible to detect points at which Kuhn follows a "conservative" formula. With the exception of explaining that shifts in technique correspond to shifts in the way a scientific community looks at the world, he operates according to parameters of classical science which does not allow him to upset "objectivity" and "rationality" as understood by nineteenth-century science. On the contrary, he suffices to eclipse these terms only in moments of crisis. Thus, in spite of "irrational" periods of research, there is always a return to order at some point, followed again by cyclical crises that are imposed upon scientists by "nature refusing to express itself in the accepted language" (Prigogine & Stengers, 308).

What drives Kuhn's research programme is discontinuity and crisis followed in sequence by order and periods of normal science. A return to the "normal" is sought by a process of reversing discontinuity. Crisis is conceived as a tunnel through the which the scientist passes in order to return to continuity. In reiterating my critique in the previous paragraph, it is difficult to see how Kuhn transgresses the thresholds of the classical scientific method of learning paradigmatic solutions to scientific problems, with occasional diversions from decided solutions in order to attend to new problems. New solutions replace old, and science proceeds according to a mechanical logic, a logic of reversibility and interchangeability."

My question remains: if Kuhn is only reiterating positivist tendencies, how is it that his work has had such a pr found impact on both critics and supporters? In Kuhn's case, he identifies a loss of faith in ideal pursuits, and this existing from point challenges epistemological foundations. He challenges foundations in a historical space, evoking the past in order to understand a present. He does not do this for the purpose of contesting people, places and events. Rather, he challenges historical space in order to question the overall organization of knowledge, and comparable patterns of human behaviour and cognition. Understood in this way, Kuhn does succeed in cracking nineteenth- and twentiethcentury epistemology to allow for the escape of "other"

⁶ This critique comes out of recent developments in chaos theory. See Prigogine & Stengers, 291-313. They argue that Kuhn does not stray from classical scientific method that depends upon the concept of reversibility. Kuhn, while he exposes the discontinuity in scientific processes, returns to a narrative of continuity, or "normal science." The theory of Prigogine and Stengers represents an epistemological shift to irreversibility of systems in which they concentrate on the hidden continuities in scientific processes in order to make the transition from a state of being to becoming.

epistemological projects.⁷

It is precisely his interrogation of cumulative and linear conceptions of science history that gives credence to his method. He severs the linear imaginary that passes through historical events to reveal a past which is directly connected to a present, and a present which precedes a future. On the contrary, untold stories, and the exclusion of historical information thought not to bear relevance to a history and philosophy of science, are reconsidered in Kuhn's methodological inquiry that challenges the derived symmetry of scientific revolutions:

Historians of science have begun to ask new sorts of questions and to trace different, and often less than cumulative, developmental lines for the sciences. Rather than seeking the permanent contributions of an older science to our present vantage, they attempt to display the historical integrity of that science in its own time. (1970a, 3)

In this respect, the importance of history is not to legitimate lineage. On the contrary, it is a highly contestable field that is neither determined nor determining. In terms of understanding a present, we may only do so in reflection. History is not "in the making," but instead is always made, stories pieced together through self-reflection

I return to this point in Chapter Two of the thesis in which I argue that feminist critiques of science embrace Kuhnian principles in order to unpack what one might mean by the term "objectivity." Earlier examples of feminist research weathered the storm of adding the missing category "gender" to scientific research only to essentialize it, and then undermine their contributions by neglecting to question "objectivity" as a methodological tool.

by the historian. Historical inquiry is steeped in the perspective of the interpreter, yet it is only through historical inquiry that we may have access to a present, which can only ever be made intelligible in relation to a place in time that is anterior.

This relates to a Kuhnian paradigm in the way that changes in ways of seeing are not known during the experiment, but that there is ultimately a chance factor built into the methodical ordering of the experiment. Chance manifests itself in crises at which point normal science methods are undermined, and a new way of seeing problems surfaces--the paradigm shift. In this respect, the rational and the irrational are not binary opposites isolated from each other. On the contrary, there is an inherent relationship between the two, or a hidden continuity in communication, which allows for both aspects of research to interact.

Rationality, order, and continuity do not unfold in front of our eyes. Making claims to knowledge results only in one's capacity to put stories together where knowledge claims are be power claims. The result need not the anarchic irresponsibility of never having to be accountable to a present because we cannot understand it. Rather, what is demanded is a humility toward the possibility of owning "truth." By acknowledging chance, interpretation, and social formations, Kuhn challenges the very precarious notion of science as a highly controlled and predictable endeavour. It

is by virtue of such precariousness that we rework stories, make new knowledge maps, and reflect critically upon objectivity as contrived, and not evolutionary.

The predicament of epistemology is that knowledge cannot be deduced from a set of ordered principles. The very process of deriving ways of seeing the world turns on a foundation of inconsistency, discontinuity, and unpredictability. Belief in ideals of order and "truth," evidence, and proof is aggravated by our inability to achieve these ideals, and so the irrational (or the not-rational), riddled with scepticism toward method, becomes the turning screw, and that only the guarantee of a quasi-authority is within grasp. Earnest Gellner elaborates this "monist" predicament in philosophy:

If only the whole of logic and mathematics could be deduced from a limited set of safe premisses, the whole edifice would thereby be made trustworthy. Today what is interesting is not so much that the realisation of the ideal has not been achieved, but rather that the ideal itself has lost its appeal and authority, that many of those who are most respected in these fields express doubts about the very desirability of pursuing this ideal. (6)

In expressing doubt, Kuhn's argument turns to expose the irregularities of history, the gaps, and hidden spaces, his purpose being to draw new maps. It is not a matter of rebuking history in a contest for credibility. He is speaking about an ethics that would be held accountable for its knowledge claims, claims which must be locatable in relation to a sociology as well as a history and philosophy of science. Kuhn

wants to weave an ethics into the fabric of science bistory that would respond to contemporary institutional concerns. And thus, the role for history changes dramatically. I quote Kuhn on this role for history in which he proposes that "history, if viewed as a repository for more than anecdote or chronology, could produce a decisive transformation in the image of science by which we are now possessed" (1970a, 1). Kuhn wants to depart from a persuasive pedagogy that, over time, has dominated the scientific canon. It is a move toward a critical history, rather than following a chronicled one.

And so I return to the problem posed as to whether Kuhn should be seen as an epistemologist or as a historian-poet, likewise contribution of paradigms and to the d:3 epistemological turning points. Kuhn's interrogation of a topdown manner in which knowledge has been documented, preserved and communicated, and his suggestion that we write and rewrite history in order to enhance the present, do warrant contribution to an epistemological shift. For this methodology Kuhn can be considered an epistemologist; however, his failure to break away from a conflict-resolution formula by offering historical relativism as an alternative to value-neutrality still holds omnipotence in high regard. The result is a "pushme-pull-me" logic that stalls itself. To understand this predicament, it is helpful to turn to the critiques brought forward by Sir Karl Popper.

Popper-Kuhn Debates

Karl Popper's critique stems from one of his own theses, "that we approach everything in light of a preconceived theory" (1970, 52). Popper argues that Kuhn's misreading of this thesis is an example of Kuhn staying true to patterns of "normal" science, that the researcher approaches a set of problems with certain expectations. Furthermore he argues that Kuhn's understanding of Popperian science is steeped in Kuhn's own ideological assumptions, being that there is a distinct "normal" and "extraordinary" periods of divide between research. Popper's charge corresponds with my question at the beginning of this chapter when I asked whether or not Kuhn takes a self-reflexive stance regarding his own position in the history and philosophy of science to locate himself in relation to this history, or instead merely reworks a formula for discovery--isolating a problem, making assumptions, and doing research. According to Popper, Kuhn follows the same pattern for which he criticizes the institution of science -conducting "normal" science. If we follow Popper, Kuhn is not a radical epistemologist. In taking a closer look at the debate, however, it is possible to rework a Kuhnian approach through Popper's criticism.

Popper upholds critical thinking as an ideal of science. He makes the argument that if there is a "normal" scientist, in the Kuhnian sense, he/she has been taught badly, and is a "victim of indoctrination" (1970, 53). The distinction here is
between scientists as routine puzzle solvers and those as "pure scientists" who observe a method of critical thinking. For Popper, routinized science is a danger to science pursuits in general because it focuses on "knowing the facts" at the expense of making inroads and contributions. The difference in perspective between Popper and Kuhn has to do with how each situates the history and philosophy of science. Popper uses science as a mirror, setting it apart from other intellectual pursuits, where metaphors of reflection lead to rational correspondence with reality. In comparison, Kuhn does not naturalize a separation of the world of science from that of non-science in which the former maintains a dustinctly "rational" discourse over the latter. Kuhn views science as neither more nor less "rational" than other intellectual pursuits, and therefore in terms of epistemology, he disputes a transcendence model in which science ably captures and reflects reality. That is, ideology and fact both constitute scientific pursuits.

Popper's historical account maintains a view of prience that diminishes chance, and that through a method of falsification, one can establish universal doctrines. Science does not proceed forward from verification of postulates, but rather must succeed in exposing theories to tests of falsification. Only then can theories rightfully be acclaimed and applied. Here Popper separates the "real" scientist, the "serious" scientist, from the scientist who follows doctrine;

however, Popper acknowledges the importance of dogmatism in science, for it is dogmatism that lightens the severity of critical thinking in order to expose the "real" power of theories (1970,55). Paradoxically, scientific research is extraordinary, and it is necessarily dogmatic, possibly but not absolutely revolutionary. This thinking, along with a principle of falsification, resonates with Descartes' notion of rational science that must doubt all that can possibly be doubted in order to arrive at "some clear and simple principle that no man [sic] in or even out of his senses possibly could (Smith & Grene, 13). That is, it clings to an doubt " Enlightenment ideal of science as existing outside the domain of nature, which sets it apart from other intellectual pursuits by its capacity for reflecting and revealing "truth." This method of science biases the negative in which, Gellner "negative re-endorsement writes, says, or more characteristically implies, that after the overcoming of one big error, after the slaying of the dragon, there is no problem" (52).

In the end, falsification assumes first and foremost that research proceeds from rational and ordered grounds, that we know, and therefore reflect, understanding in our thoughts and actions at all times, science being exemplary. As suggested by Richard Rorty, Kuhn's expression of a loss of faith in science as an ordered activity, coupled with his rejection of the autonomy of science from theology and politics, has been greeted with "fierce indignation" by supporters of an Enlightenment "grid of relevance" (Rorty, 333). It is Kuhn's desecration of science as a distinctly ordered and rational pursuit, coupled with the argument that its logic of argumentation and research fails to differ expressly from other intellectual discourses (history, for example), that is at once his most criticized and, likewise, most revolutionary epistemological contribution.

This view separates Popper and Kuhn as one who is a "dragon slayer" and the other who uses sociology to understand the "logic" of the "dragon." If anything, Popper's most valuable criticism of Kuhn is against a logic of historical relativism; but the accusations regarding discrepancies between "normal" and "extraordinary" research are a volley of perception, where Kuhn observes that the history of science has been dominated by politically and ideologically infused (and therefore not-rational) research canons, whereas Popper does not. Feyerabend sums this up best in his critique of Kuhn's structural logic by pointing out that "we are here dealing with a methodological problem and not with the question of how science actually proceeds" (1970, 204). By engaging a methodological critique, Feyerabend does justice to Kuhn's politico-ideological thesis on the process of scientific revolutions, and in many ways echoes Kuhn in subordinating the pursuit of "truth" to the motion of the science machine in general. On the task of the scientist

Feyerabend writes:

The task of the scientist, however, is no longer "to search for the truth," or "to praise god," or "to systematize observations," or "to improve predictions." These are but side effects of an activity to which his [sic] attention is now mainly divided and which is "to make the weaker case stronger" as the sophists said, and thereby to sustain the motion of the whole. (1985, 30)

Feyerabend serves as a bridge between Popper and Kuhn in this case, and helps one to see how, and in which ways, Popper and Kuhn converge. Each differs according to the degree to which science is predominantly "normal" and "extraordinary," yet both depart from the initial assumption that the world is rational. Kuhn's logic is a historical relativism, that the role of the scientist is relative to historical and cultural space and not relative to "truth." Popper's is a logic of falsification adhering to the possibility for absolute and objective "truth." However, he does allow for the disclaimer that one may never hold the whole of truth in one's palm (Popper 1970, 56). Accumulation of knowledge is for Popper a route to "truth." In this sense Popper maintains faith in a promise of progress for the sciences:

I do admit that at any moment we are prisoners caught in the framework of our theories; our expectations; our past experiences; our language. But prisoners we are in а Pickwickian sense: if we try, we can break out of our framework at any time. Admittedly, we shall find ourselves again in a framework, but it will be a better and roomier one; and we can at any moment break out of it again. (1970, 56)

Popper regards the shift from one framework to another as

a matter of choice, a change in technique. In light of this conjecture, Kuhn's notion of paradigm shifts differs significantly from Popper's "choice model" of scientific technique, and therefore aligns with overall epistemological change. For Kuhn, it is not possible to leave a framework without first undergoing a radical shift in ways of seeing problems. Popper, in comparison, assumes that resistance to frameworks and paradigms belongs to the ingenuity of the scientist. For Kuhn, it is not choice, but rather crises in methodology that make for revolutions. Crises are saturated pure potential--potential for with the insurgence of "extraordinary" research, and, after this, members of a scientific community experience a change in the way problems are perceived. Changes in perception are not in all cases equated with epistemological breakthroughs; however, it is in the wake of waves and gaps produced by perception shifts that the researcher/historian/philosopher pieces together an epistemological map. In self-reflection, epistemological shifts are produced as "effects" of an ongoing reorganization of knowledge. This is what I understand to be Kuhn's main contribution to the history and philosophy of science: the susceptibility of scientific discovery to cultural, social, and historical overlap, delineating highly "irrational" processes.

The Value in Critically Accepting a Kuhnian Paradigm

I began with questions concerning Kuhn's contributions to the history and philosophy of science, and suggested that in order to assess these contributions as either coming from an epistemologist, or a chronicler of history, one would have to be able to situate Kuhn self-reflexively in terms of his text. I argue that he can be situated self-reflexively in part, yet remains tethered to his own unproblematized account of "objectivity" and "rationality." This raises a very important question: how does one reconcile the considerable status warranted by a Kuhnian paradigm in the history and philosophy of science with the fact that this impact by far exceeds the immediate depth of his arguments? To reiterate a comment made at the beginning of this chapter, the key is in how Kuhn works with the concept of history.

Kuhn makes clear one very important aspect of historical research: in order to dismantle linear conceptions of history and progress narratives, one must evaluate the contributions of players in history relative to the historical frameworks in which they are situated, and not as forerunners of cumulative stories. When the flow of history is disturbed, such disturbances reveal textures that may otherwise remain levelled by the trail of stories defining science as an ordered activity. In breaking this trail, Kuhn acknowledges the possibility for the irrational moments otherwise camouflaged by traditional scientific approaches, and in so doing considers the very subjective aspects of scientific discovery.

It is this inclusion of "subjectivity" in science history that helps to reconcile the contradiction between Kuhn's significant contribution to epistemological debates in science history on the one hand, and the superficial detail of his arguments in The Structure of Scientific Revolutions on the other. In this respect, I prefer to situate Kuhn as a catalyst to an epistemological shift, but only in the way that one observe Kuhn's own conception of history and discovery, being that the significance of the event is always produced in considered retrospect when it is alongside other circumstances. Thus, there remain a few sensitive areas in Kuhn's argument where it does not stand the test of a paradigm shift. In closing, I would like to summarize these soft spots and identify how in taking a step beyond Kuhn (though not rejecting him) the value of his contributions are amplified.

The first problem pertains to self-reflexivity. Although he attempts to reflect critically upon the history and philosophy of science, Kuhn does not adequately interrogate his own position as a historian of science. What I mean is that Kuhn, while careful to rethink linear narratives of progress, and to examine science as a socially organized activity, he returns his critique to the present via a similarly ordered path. That is, he deviates from the rational and the cumulative only to return to reworking a rational

programme in the end. He does not develop critiques of "objectivity" and "rationality" as concepts, but instead criticizes only the instances in which science makes use of these terms. For Kuhn these terms are problematic in application, yet not problematic by definition. As a result, his historical inquiry is diluted by a retention of traditional notions of "objectivity" and "rationality." This is most evident in his conception of science as a normal activity interrupted by crises, and followed by the practice of extraordinary research, returning in the end to a normal pattern, and so on. This logic preserves obvious continuity, offset only by abberations that are relative to historical time and place.

This brings me to a second problem: historical relativism. Kuhn's relativist argument is a double-edged sword. Initially, he breaks with a linear description of science history in his attempt to locate scientists relative to their historical contexts. By contextualizing science he is able to instigate a critique of the way in which historical events are threaded together to naturalize scientific knowledge as pre-determined. However, with relativism as an alternative to positivist determination he avoids, with dangerous "innocence," the issue of responsibility. Kuhn's thesis, in accepting the interchangeability and mobility of the historically relative "subject," ironically, avoids having to situate the same subject in terms of responsibility and

accountability.

The relativist argument, while it attempts to dismantle dogmatism, risks dissolving important boundaries of distinction that respond to accountability, responsibility, and privileged perspective. It is this "when in Rome" attitude that undermines the quality of research:

What is 'Rome'? The upper class of the contemporary municipality of that name? Centra! Italy? The Common Market? Catholic Europe? Countless boundaries, geographic and social, vertical and horizontal, criss-cross each other in a rapidly changing world. Relativism is not so much a doctrine as an affectation. That signpost seems to point nowhere, or everywhere. (Gellner, 49)

How does one situate relativism? Is it a pretence? Behaviour? Technique? By taking historical relativism as critical method, Kuhn shifts technique and method in the history and philosophy of science. However, I would include here that he does not go far enough to have altered the way in which we view problems. His is a unique and serious contribution to epistemology, but is not sufficient to turn the tables entirely. In order to do so, he would have to have situated himself more critically in terms of his text, that is to establish just what his privileged perspective is. This is not achieved in his text, but is a point of departure for critical shifts in "objectivity" and "rationality" for a feminist science project.

With Kuhn's ideas in mind, I suggest that one retain his agenda as a building block, an entry point to developing

contemporary shifts in epistemology. One must remain cognizant of the fact that it falls short of dealing explicitly with the very serious issue of what one might mean by "objectivity" in science, and in research inquiries in general. Without questioning the terminology, it is difficult to see how any research programme could be anything other than tainted. And for this I argue that Kuhn's position of privilege has prevented him from arguing through a sophisticated critique of "objectivity" and "rationality." Returning to Masterman, Kuhn'a position is more than that of a historian-poet, but only in so far as he maintains a traditional metaphysical point of view.

has the credibility to question? Who, then, The scientists for whom modern notions of "objectivity" and "rationality" have served them well in their pursuits? Those whose inquiries hedge on a sociological understanding of institutions such as science? Or better yet, the "others" eclipsed by traditional notions of "objectivity" and "rationality?" For this we must move beyond Kuhn and look at his work in light of feminist critiques of science. In the chapter following I develop these critiques, and discuss how in both accepting and undermining Kuhn, they have succeeded in drawing out issues which Kuhn, in his approach to scientific discovery as influenced by paradigm shifts, has only touched upon. The philosophical moment that I refer to is the breaking away of feminist epistemology from the history and philosophy

of a "neutral" science. This, I believe, is the radical shift that Kuhn was looking to unravel in <u>The Structure of</u> <u>Scientific Revolutions</u>.

Chapter Two

Feminist Practice and the Problem of "Objectivity"

Observing a Kuhnian paradigm, we learn that the scientific research process is not independent of shifts in the phenomenological world, and includes the overlap of social, cultural, and historical circumstances. That is, the subject matter selected for study, the inclusion and exclusion of criteria, and the methodological choices one makes in establishing a research programme are sociological phenomena. Investigations and results, as Kuhn was careful to point out for science studies, do not exist outside the realm of values and interests; nor do phenomena, or subjects of inquiry, change in relation to a fixed, and disengaged observer.

A Kuhnian paradigm draws attention to these bases and biases involved in the decision-making and research processes. Using Kuhn as a starting point, feminist critics of science are concerned with these issues and engage critique that is particularly sensitive to an interrogation of subject and object positions. While Kuhn's contributions to the "relative" positioning of the researcher have proved to be a valuable starting point for science studies as social/cultural studies, the feminist critique challenges the empathetic interchangeability and mobility of the researcher. Theirs is a desire to engage in discussions of the terms of reference

for research, specifically to develop a sense of "objectivity" and "rationality" that works for a feminist science project. Sandra Harding and Evelyn Fox Keller, for example, emphasize the multi-faceted importance of discussing gender difference in science studies, and in so doing call into question the foundations upon which the institution of science has been cultivated.¹ While making a commitment to politicizing subjective "experience" in the research process, Harding and Fox Keller are sensitive to the problem of essentializing subject position when establishing and defending point of view.

In rethinking the intellectual position feminist scholars have occupied as insiders/outsider: in "traditional" academic spaces, feminist inquiry must address the problem of naturalizing binary oppositions. To evoke Kuhn once more, the dialogue he sets up between the rational and the irrational aspects of science begins to critique the binary logic that has naturalized science as an intellectual pursuit. A feminist science project, coming out of critiques such as Kuhn's of "traditional" modes of analysis, must work to disturb the gender binary that has succeeded in both isolating and relegating to particular enclaves the "feminine" in science.

¹ Harding and Fox Keller have discussed at length the issue of gender. For Evelyn Fox Keller's argument see the articles "How gender matters, or, why it's so hard for us to count past two" and "Feminism and Science." For Sandra Harding's point of view see "The Instability of Analytical Categories of Feminist Theory" "Epistemological Questions" and <u>The Science Question in Feminism</u>.

In addition, a feminist project must maintain a critical specificity of "situatedness" of subject position in order to challenge the problem of gender exclusivity. The most significant of these concerns is to sustain a strategy of belief in science while proceeding to raze privileged notions of "objectivity" and "value-neutrality" that have made it difficult for feminist research to gain ground in the sciences. Put another way, the strategy is to dismantle a privileged sense of binary opposition in order to situate this binary as partial among multi-dimensional perspectives."

A critical inquiry of this kind must familiarize itself with the potential for superficial ideological shifts, especially when the issue at hand involves rethinking and reconsidering structures of authority. To replace masculinist stories with feminist ones, or to reject fixed objectivity in favour of a travelling relativism, is to deconstruct the machine in order to reconstruct it. Rather, we should investigate how infinite mobility and judgment in terms of relativism represent vested interests. Thus, the problem persists: what do we mean by the term "objectivity," and further, how can feminist theory propose a responsible revisionist schema that breaks out of a binary logic

I develop this point in Chapter Three with specific reference to Donna Haraway, who argues for a radical specificity of subject position while maintaining that "vision" is intensely multi-dimensional. Her critique echoes rineteenth-century visual and perceptual techniques, which I discuss in connection to the work of art historian and epistemologist Jonathan Crary.

(subject/object, feminine/masculine) and accounts for the "situatedness" of the observer?

"Responsible" research, therefore, must take to task the paradoxical fiction of the researcher as both present in the experiment, and absent from value judgments. The equivocal tone of this dialogue is not illusion, but is an actual predicament for the researcher. It requires that one question the terms of reference upon which inquiry is based: valueneutral inquiry is never innocent of circumstance.

In Chapter One I suggested that "rational" science, steeped in its own metaphors of reflection and reproduction, supports the possibility for projecting a "mirrored" universe through value-absent objectivity, and that such causally invested inquiry proposes the possibility for a "true" reflection of the natural world. While there are specific charges to be made about the "nature" of Cartesian-influenced rationality, the purpose of my critique is to discuss how certain social, cultural, and historical arrangements have helped to perpetuate a Cartesian-influenced value system. In this way I embrace Bordo's argument that explores Cartesian rationalism "as a defensive response to that separation anxiety, an aggressive intellectual "flight from the feminine" into the modern scientific universe of purity, clarity, and objectivity" (5). I argue that the Cartesian predicament (including binary distinction, and point-to-point visual perspective in the pursuit of "truth") be considered a pivotal

point from which to engage in critical debates on contemporary epistemology.

My retention of Bordo's "flight from the feminine" is used to mark an escape from a system of values to which there is no return. In this way, I suggest that one reconsider a nostalgic desire to return to methods and modes of seeing that are of history's past. The point here is to understand that "connectedness" while epistemology denotes the of observational practices, one cannot approach a study of epistemology with the hope of making a circular and organic journey to an initial and ideal starting point. In this respect, I argue that our observational practices are technologically bound (but not determined), and the way in which we make stories about these processes is related to how one locates the concept of history. I return to this point in greater detail in Chapter Three. A Kuhnian conception of paradigmatic organization, therefore, lends itself to a revisionist project of historical inquiry, and provides an important opening for feminist inquiries to challenge traditional conceptions of "rationality" and "objectivity."

In this chapter I introduce feminist empiricist and standpoint critiques of science in the context of groundwork analyses that have prepared a terrain for wider objectivity debates. I refer to what Haraway describes as "situated knowledges" (1988, 575-97), and what Harding sees as a need for "strong objectivity" (1991, 138-63). Central to my concern are the problems implicit in replacing traditional conceptions of "objectivity" with "feminized" models, which are equally susceptible to their own power dynamic as are traditional models. Secondly, I would like to communicate the danger of simply shifting to a relativism that positions itself both everywhere and nowhere, or as Donna Haraway has suggested, the other side of the "God trick."³ Finally, the last part of this chapter attempts a strategy for a "feminist" methodology that has currency beyond the "ghetto" of "feminized" research, and one that can be imported to the study of communications.

Feminist inquiry is not an additional methodological approach to address and satisfy gender inclusiveness. On the contrary, it signals a distinct moment in epistemological development at which the observer shifts in technique of observation. This shift pertains to an "otherness" in discourse and observation, not in an empathetic way to occupy the "other's" position, but rather in a manner in which the observer engages in an awareness of his/her own "otherness" and subject position of objectivity. Feminist inquiry is not the "only" approach to achieve this; however, I argue that the feminist contribution is a significant turning point that must

³ See Haraway 1988, 581-83. Here she refers to the "God trick" as the act of playing authority, marking the world, and directing "truth." The other side of the coin of the "God trick" is relativism in which situatedness is constantly shifting such that the observer is saturated in perspective at the very moment that the observer is not locatable in terms of any distinct r-ference point. In this narrative, "anything goes." For Donna Haraway, therefore, there two sides to every "God trick" coin, and this is a point to be wary of in research inquiry.

be considered in contemporary epistemological inquiry.

This shift in epistemology directs attention to disarming traditional foundations of authority, arguing that beneath these fictions there have always been "foundations" of difference on which knowledge production turns.⁴ Knowledgeseeking, probing, and looking do not necessarily align with panoptic metaphors. Rather these activities must be assessed as partial in their attempts to recover, reclaim, and reinvent visual metaphors of "truth."⁵ In this respect, even relativism as a critical alternative must be held accountable for "valuepresence."

⁴ This idea comes up in the work of Donna Haraway, whose arguments regarding identity politics of ethnicity and gender have in part focused upon the Third World, "feminized" worker. Central use of Trinh Minh-ha's to this is her concept of the "in/appropriated other"--one who does not fit the modern taxon--as a way of using difference critically so as to avoid the liberal humanist vocabulary that attempts to reflect rationality in the image of itself. Thus, she critiques "rationality" as an invention of the Enlightenment, regarding it as one of many fictions. In this, foundations of authority presented as the ordered universe are illusive, and do not necessarily lead to objective "truths", uninterrupted by social, historical, and cultural circumstances. See Donna Haraway "Promises of Monsters" and Trinh T. Minh-ha, "Difference: 'A Special Third World Women Issue'."

⁵ By this I mean metaphors that denote "seeing is believing". Ocular obsession and and visual precedence in the world breathes into our writing such that we take great pains in resisting the probability of never "seeing all," and likewise never being able to "tell all." Again, the desire to know seduces vision and we slip into the same metaphors over and over again. Double vision, multivision, and partial vision are three potential situations that have yet to be assessed more carefully. The challenge, therefore, is not to see fully, but rather to "see partially."

Feminist Epistemology in its Early Incarnations: Feminist Empiricist and Standpoint Theories

The feminist empiricist and standpoint approaches are motivated by a resistance to, and an interrogation of, traditional structures of authority. The feminist standpoint approach, influenced by Marxist analysis, uses critical inquiry to dismantle hierarchies of knowledge. An empirical approach, in contrast, seeks less to question the overall structure of epistemology, and focuses instead on equitable patterns of research prefaced by the inclusion of gender to remedy inequity.

Harding suggests that inserting feminism into masculinedefined theoretical approaches (for example, structuralism, post-structuralism, Marxism, hermeneutics, critical theory, radical critiques of science) suffices only to provide feminist theory with a means by which to participate in masculine dialogue (1987b, 283-8). In the end we defend our reinterpretations to patriarchy instead of speaking to other feminists about bridging the gap between feminist and masculinist discrepancies. Feminist empiricist responses, in their belief that by transcending gender we may reach a "truer objectivity, " critique research processes in which theories, concepts, methods and interpretations of results have been distorted by masculine bias. While they acknowledge the absence and need for consideration of "female" as a category in research, feminist empiricism commits to value-free tenets. Rather than direct critique toward the institution of science

and social science, these approaches are firmly grounded in scientific method. Here Harding elaborates upon the principles of feminist empiricism:

By identifying and eliminating masculine bias through more rigorous adherence to scientific methods, we can get an objective, de-gendered (and in that sense, value-free) picture of nature and social life. Feminist inquiry represents not a substitution of one gender loyalty for the other--one subjectivism for another--but the transcendence of gender which thereby increases objectivity. (1986, 289)

This approach, rather than problematize the intellectual architecture put in place by Enlightenment philosophy, supports it. Underlying the argument for empirical research is a primary assumption that human beings are rational beings, where "rationality" has a distinct innateness outside of social, cultural, and historical relations. At the level of value-neutrality of research, feminist ideology links up with an overall liberal ideology of science that supposes "man," in confronting the natural world, as Elizabeth Fee reminds us, "is capable of creating a rational knowledge of that world through a process of testing and discarding hypotheses, and thus gradually progressing toward an ever more complete knowledge of nature" (9).

Feminist empiricism is sensitive to sexist social relations; however, while it recognizes these inequalities, it believes in the possibility of a "successor science" that can simultaneously remain faithful to scientific method, and transcend sex differences. It is a philosophy of equalization in which "truth" is served by value-neutral research that at one level acknowledges how the feminine has been disparaged, and at another proposes to transcend gender as a category altogether. Sex differences are naturalized and neutralized, ignoring the significance of the social milieu in which these differences are formed.

Evelyn Fox Keller suggests that this juxtaposition of gender and science has two versions, the "one-two step" and the "two-one step" (1992, 42). The former signifies the division of the world into two, whereby gender is determined by biology, and science is natural, ultimately reinforcing gender stereotypes. That is, science is not a woman's domain. Fox Keller argues that the neutralization of the feminine is a response to sex stereotyping in science. It represents the feminist empiricist attempt to combat exclusion of the "feminine" from the public domain and the domain of science. Exclusion is countered with a practice of hiding the feminine referent. Fox Keller critiques this practice and argues that positions of both difference and non-difference remain in juxtaposition to an "other" referent. She explains:

Women had observed that the division of the world into two serves them poorly -- it serves to exclude them from the domain of public life, of power, and of science. The claim that we are different meant that we are less. Quite reasonably, therefore, women fighting for admission into the world of science countered with the claim, no, we are not different. But there's a hidden kicker in this move, that only becomes evident with the question: different, or not different, from whom? (Fox Keller 1992, 42)

In a comparable critique of empiricism and the "hidden referent, " Armstrong and Armstrong are wary of the possibility of using numbers to provide a representation of social life. Numbers are inadequate aids to gaining an understanding of in which the status of situations women is women's "camouflaged by researchers' reference to scientific methodology, by the adoption of non-sexist language, by the use of similar questions for both sexes, and by the tabulation, according to sex, of most data" (Armstrong & Armstrong, 54). The point here is, can numbers represent social life, and further, what kinds of methodological assumptions must be made in order to invest in "numbers" research?

The empirical approach, while aiming to counter issues of bias, overlooks by neutralizing sexist the sexism "realpolitik" of ideological and social bases in research methodology. In addition, it does not respond to other institutional circumstances that perpetuate sex differences by neglecting to acknowledge empiricism as context-bound. Instead of radically shifting methodology, this approach clings to a is as rule bound as conservative logic, and sexist appropriations of empirical research. Therefore, how can the feminist empiricist approach release itself from masculinist properties of universal belief and rules if it observes a similar pattern of rule-driven, statistic-driven, image-driven research?

This is perhaps the most problematic aspect of a feminist empiricist approach (or any empirically based approach for that matter): that a systematic "imaging" of the world can be derived from statistical representations. It is this conservatism--traditionally accepted modes of scientific analyses reshaped by feminists--that has prompted feminists outside empiricist circles to look for methodological alternatives: the feminist standpoint approach.

Feminist standpoint theories borrow from Marxist historical materialism to address sex differences, and to draw attention to the material conditions that sustain these differences. Standpoint theories are political, and arguably essentializing, in their approach to social relations. From a position that endeavours to expose and challenge material inequalities, they argue that "experience" is a critical aspect of knowledge production, and that "experience," specifically women's experience, is devalued in value-neutral studies. The standpoint approach lends a voice to certain social groups whose experiences, because of social position, have either been distorted, or ignored completely. This feminist perspective takes Marx's concept of alienated labour and applies it to the domestic sphere, even where Marx himself does not specifically write about the status of the domestic labourer.6

⁶ This is Nancy Hartsock's transposition of Marxist ideology onto feminist politics: "If, to paraphrase Marx, we follow the worker home from the factory, we can once again perceive a change

The standpoint approach identifies the inconsistencies that comprise social relations thereby seeking to politicize these relations, and to pull them out of marked feminine spaces. It prioritizes the "situatedness" of the historical and feminine subject, but does not propose to surrender subject position to a taxon of binary oppositions. Hartsock, who is critical of the transparency of dualism, makes sex relations more complex, and in so doing demonstrates scepticism toward feminist research that begins and ends with the inclusion of gender as the missing half of the male/female dichotomy. In the following she identifies the "essence" of a standpoint perspective and provides this definition:

Rather than a simple dualism, [standpoint] posits a duality of levels of reality, of deeper level or which the essence both "surface" or the includes and explains appearance, and indicates the logic by means of which the appearance inverts and distorts the deeper reality. In addition, the concept of a standpoint depends on the assumption that epistemology grows in a complex and contradictory from material life. way (Hartsock 1987, 160)

Standpoint theory acknowledges inclusiveness as an integral component of research, while it proceeds to delve

in the dramatis personae. He who before followed behind as the worker, timid and holding back, with nothing to expect but a hiding, now strides in front while a third person, not specifically present in Marx's account of the transaction between capitalist and worker (both of whom are male) follows timidly behind, carrying groceries, baby and diapers" (1987, 64). She extends the parameters of Marxist epistemology to include the domestic sphere and the domestic worker who is otherwise absent in his work. See also Hartsock's book, <u>Money, sex, and power</u> for more on her marxist perspective.

deeper into the structural "logic" under which "reality" operates. Gender, therefore, is important, but so are the conditions in place that make gender a value-loaded and contradictory concept.

The feminist standpoint position, while it values "subjectivity" and the material conditions that comprise subjective experience, depends on two "problem" concepts: "reality" and "experience." Reality automatically evokes a contest between the more "true" and more "false" conceptions of the way the world works, and experience privileges the informant, the one who "experiences" and therefore can express masculine distortion with an element of adequacy. Hartsock begins to allude to this problem in terms of the complex deviation of theory from practice and of practice from theory; however, as I discuss later in the chapter in terms of Harding's conception of "strong objectivity," this approach cloaks essentialism.

At the risk of entering into a philosophical tangle, I must introduce the problematic of "understanding." That is, simply because I "see" and I "experience," does this necessarily preclude that I understand? My charge is not against an essentialism implicit in the work of standpoint feminists. It is linked to the predicament of seeing and believing, seeing and understanding. In this way, standpoint theories cling to a logic of reason, a logic of the rational, in that they assume that by introducing complexity and webbed

relations to analyses we may interpret a thing called "reality," that we may get a clearer picture. Standpoints, although they are perspectives, are also complete perspectives and conjure a discourse of "wholism" in their relation to time and place. While our vision is mediated by historical and material conditions, the result is to come full circle by identifying a distortion of vision. That is, if one can refine the categories of analysis and make experience count, one may access "reality." The problem now turns to epistemological notions of the "real." It is not the purpose of this thesis to ascribe to perceptions of the "real." However, in pointing to this tautology, I argue that totality in any perspective does not sufficiently bypass binary oppositions, but rather it reinforces this binary.

Epistemological Panic and Frustration

This is the frustrating aspect of epistemological inquiry: the potential loss of the political by succumbing to circular arguments. However, there are feminist interests that attempt to break out of this circle. They are as ambitious as the Enlightenment project to which our techniques of observation and structures of thinking are potently connected, and involve a radical rethinking of "objectivity" in ways that can retain its operational value without replicating valueneutral, liberal ideologies.

This work comes from feminists who believe in a need for

science, yet who also express their dissatisfaction with the terms on which it has been passed on by Enlightenment reason and rationality, and filtered through narratives of progress and industrialization. In particular I would like to draw attention to the ideas of Sandra Harding and Donna Haraway, who, as feminist critics of science, challenge the terms of reference of "objectivity" and remain wary of relativist alternatives in their efforts to put a "successor science" to work.

"Strong Objectivity" and the Need for Situated Knowledges

Sandra Harding asks whether standpoint theory has abandoned objectivity to embrace relativism, or whether it has in fact "remained too firmly entrenched in a destructive objectivism that increasingly is criticized from many quarters" (1991, 139). Harding's point is to be taken seriously, and is one that connects with the above-stated problem in which I argue that standpoint theory assumes that research inquiry is a rational pursuit, and that we maintain a conscious awareness of our vested interests in research at all times. Such rational assumptions are at cross purposes with the very relative exercise of interpretation. This is a complicated turn of events that requires a keen strategy in order to avoid slipping into the abyss of over-relativizing, and value-neutral bias.

The challenge presented to feminist epistemology, it

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would appear, is to continue to dismantle masculinist structures without erecting new systems of authority in their place. That is, if we are going to legitimately reorganize canons, we have to be sensitive to the substitution of new ones. This task demands the presence and responsibility of the observer as an integral component in the research process. We must be able to locate the observer at the crossroads between socially situated knowledge and absolute objectivity. Thus, my question is not what can feminist inquiry do for objectivity, but rather what can "objectivity" as a concept do for feminist inquiry, when the assumption of rationality in inquiry in general is a point of contention.

To address this question, I rely on Harding's speculation about the "naturalness" of nature that is often misconceived in traditional objectivity-driven methodologies:

What objectivism cannot conceptualize is the need for critical examination of the "intentionality of nature"--meaning not that nature is no different from humans (in having intentions, desires, interests, and values or in constructing its own meaningful "way of life", and so on) but that nature as-theobject-of-human-knowledge never comes to us "naked"; it comes only as already constituted in social thought. (1991, 147)

What Harding's point draws attention to are the "mediated" properties nature. Or rather, nature, as it appears to us, is the produced effect of a multitude of overlapping practices, or what Harding expresses as "already constituted in social thought." Harding's point has more significance than simply to be restricted to ideologico-political terms. Here there is a difference between mediation, the conception of a filter through which knowledge passes, and constitution, the conception of a patchwork arrangement of disparate yet related elements. Mediation is tethered to point-to-point processes, whereas constitution suggests a greater complexity in the way in which information comes together. As I discuss further in Chapter Three, this attends to the difference between linear perspective of the Enlightenment and shifts to multidimensional perspective which took place during the nineteenth century.

Donna Haraway puts this another way when she talks about a need for "non-innocent" ways of seeing, ways that include both ethics and politics in the research process. Haraway's critique of traditional conceptions of "objectivity" brings to light the necessary and contradictory paradoxes that are companions to a particularly feminist retrieval of objectivity studies:

Feminists don't need a doctrine of objectivity that promises transcendence, a story that loses track of its mediations just where might held someone be responsible for something, and unlimited instrumental power. We don't want a theory of innocent powers to represent the world, where language and bodies both fall into the bliss of organic symbiosis. We also don't want to theorize the world, much act within it, in less terms of Global Systems, but we do need an earth-wide network connections, including of the ability partially to translate knowledges among very different--and power-differentiated-communities. (1988, 579)

Haraway's argument is that we cannot transcend the

politics of gender without transcending biology and the discourses and practices by which we are constituted. That is, as long as we have bodies, we also have positions in the social world. There are certain knowledge claims from certain positions that have stakes in establishing the social parameters of what counts and what most certainly does not count as knowledge. Thus, gender is discursively negotiated, and so too are bodies. Her emphasis on connection is not oriented toward making links so as to achieve a systematic reconfiguration of connected bodies (a functional approach), acknowledges the rather is one that perpetual but reorganization of relations between and among communities, where special interests, power dynamics, and social relations make up the interference pattern. In this scenario, ethics and responsibility are unabashedly value-loaded, and are also what separate feminist objectivity from an "innocent," or a supposedly value-neutral objectivity.

The term "value-loaded," as I have used it, needs to be situated. Understood as "bias," this term denotes substitution of one authority for another. However, if we regard "valueloaded" as signalling the need for a self-reflexive component in research, it raises the importance of the partial, and rejects the impartial. The privilege of partial perspective is the awareness of one's own "non-innocence" in moving in the world. Again, awareness of "non-innocence" is not a function of learning, obtaining, collecting, and compiling information. It is to have a sense of one's "situatedness" in production in circumstances, as opposed to construction of them. This is an intricate tangle of semantics whereby the choice between "of" and "in," two seemingly "innocent" words, is of utmost significance. The observer in this arrangement, with respect to objectivity, is not outside of the social world and in position to look down upon it, nor outward on it, but is situated in it, seeing not in totality, but in partiality, or for Donna Haraway, partial perspective.

Harding's call for strength, therefore, lends itself to a notion of self-reflexivity that I identify as compatible with Haraway's notion of partial perspective. It is a way of seeing that regards responsibility, ethics and selfreflexivity as central to all discussions of objectivity, and is critical of alternatives that are elitist.' Harding explains:

To enact or operationalize the directive of strong objectivity is to value the Other's perspective and to pass over in thought into the social condition that creates it -- not in order to stay there to "go native" or merge the self with the Other, but in order to look back at the self in all its cultural particularity from a more distant, critical,

⁷ Harding is particularly critical of women's studies as an integrative and inclusive approach to the study of women's oppression. She is sensitive to the very "real" capacity for white, Western feminism to provide tutelage for "other" feminists. See the chapter "Strong Objectivity and Socially Situated Knowledge" in Whose Science? Whose Knowledge (138-63).

objectifying location.⁸

question of "otherness" is a site of major The reconstruction of discussions of objectivity. While both the observer and the "other" are situated, the perspective of "otherness" is not unique to subjects of inquiry as we objectify them. That is, if we follow Harding's backwardlooking approach as outlined in the above guotation, the possibility of "otherness" is not restricted to the subject of study, but that the situation of "otherness" includes the observer. In passing over into the social conditions that create the "other," and reflecting upon the "self" from this migratory location, the observer passes over into the social conditions of his/her own otherness. Haraway supports this in her approach to the promise of objectivity that is partial connection, where the knower takes the subject position of objectivity (1988, 586). I am my own "other," and likewise I am never without my own "other."

A similar approach to objectivity and otherness is evidenced in James Clifford's work (in editorial collaboration with George Marcus) who argues that ethnographic "truths" are "inherently partial--committed and incomplete" (7). Again, here is the thread of responsibility and "situatedness," this

[&]quot;See Harding 1991, 151. Harding's perspective here is very similar to self-reflexive critiques in ethnography. In particular, see the Jim Clifford's "Introduction" in <u>Writing Culture: The Poetics and Politics of Ethnography</u> (1-26). Clifford summarizes the crisis of observation experienced in the field of ethnography in which notions of cultural imperialism, representation of others, and the problem of writing culture are pressing ethical issues.

time located in a methodological critique of anthropology. In connection to a perceived "poetics" in science writing as suggested by Kuhn, Clifford and Marcus concede that there is both a literary and a poetic component to fieldwork writing about the "other." It is not to replace "truth" with a more congenial conception of writing results. Rather, the turn to "poetics" moves away from a "truth" model of scientifically objective analyses, yet does not run counter in a way that promotes oppositional paradigms. An emphasis on fiction in social science writing presents a challenge to the primacy of "truth" that has dominated the social sciences' replication of natural sciences methodology. "Truth" is secondary to situated knowledge whereby the methodological shift is toward "seeing" in terms of partial perspective, against wholisms.

One could argue that this perspective breathes air back into relativism. However, this argument is not made without is impossible to situate the "other" polemic. It as ahistorical, acultural, asocial. In the context of the arguments of Harding, Haraway, and Clifford and Marcus, the "other" is not without location and subject position. Thus includes criteria such as history, culture, and the social. A discourse of the "other," therefore, is not generally or judgmentally relative as if to reinvent an omnipotent point of view. It maintains a radical specificity to historical, cultural, and social circumstances. The "other" of inquiry is relative to history, culture, and the social, and likewise is

the "otherness" of the inquirer, making the inquirer intensely visible in the observation process (as opposed to the problematic "invisible inquirer" of traditional objectivist science).

Beyond Essentialism and Judgmental Relativism

Returning to Harding, her efforts to accentuate the resonance between subject and object acknowledges that there are social spaces of "otherness" which present an alternative to essentialist and relativist methodologies. Ι use "resonance" in an attempt to wrestle with the binary distinctions that have succeeded in deceptively naturalizing subject/object relations and feminine/masculine relations. In this way, Harding's "logic" suggests an ongoing recombination of effects. We cannot cross the divide, to "go native", to see from the other's perspective by means of interchangeability and mobility, but rather, we can engage partially, and "situatedly." Harding explains why this difference, in particular gender difference, is an important scientific resource:

It starts thought in the perspective from the life of the Other, allowing the Other to gaze back "shamelessly" at the self who had reserved for himself the right to gaze at whomsoever he chooses. (1991, 150)

The "other" is not suggestively bound by ideology, nor is she/he determined, constructed, fabricated. Since human lives and experience are the necessary bases of knowledge in social

science research, we must be wary of switching to methodological alternatives in which only the experiences and lives of the oppressed are critically valid, and therefore "authentic." This is Harding's criticism of deceptively essentialist incarnations of standpoint feminism (1991, 270-2). The "other" (included is the "other" of the "self") is an effect of a complex arrangement and reorganization of perspective in terms of perceptual technique and subject position, including history, culture, and the social. In dealing with perspective in this way, Harding avoids an essentialism that caters to a distinct "feminine" subject, or a distinct "oppressed" subject, who experiences and perceives the world.

She does, however, retain a radical specificity of subject position as situated relative to culture, history, and the social. That is, quite frankly, it does matter who speaks, to whom, when, and where, and respecting these qualifications is to commit to a responsible approach to research. In respecting this position, one does not have to reject the possibility for making knowledge claims that are grounded in rational or scientific method. This is the feminist bid for a retention of "rationality" and "objectivity" in the sciences: a feminist science project.

The distinction here is between historical, cultural and sociological relativisms, and judgmental relativism, the latter representing no less than the other side of the

omnipotent coin, or as I suggested earlier in reference to Haraway, the other side of the "God trick." Judgmental relativism solicits a desire to "go native," without having to question the subject position from which one speaks, which is a position of privilege in the case of traditional notions of "objectivity." Arguing from a position of historical, cultural, and sociological relativism suggests that one cannot assume a privileged status of interchangeability and mobility of subject position to enter the world of the "other" without critically gazing upon one's own situation. This position brings self-reflexivity to the research process. Harding summarizes her position in this way:

[A] strong notion of objectivity requires a commitment to acknowledge the historical character of every belief or set of beliefs--a cultural, sociological, commitment to historical relativism. But it also requires that judgmental or epistemological relativism be rejected. Weak objectivity is located in a conceptual interdependency that includes subjectivity and judgemental (weak) relativism. One cannot simply give up weak objectivity without making adjustments throughout the rest of this epistemological system. (1991, 156)

Conclusion

"Situatedness" and observational technique are intensely important aspects of the "observer" that need to be addressed in discussions of "objectivity" and "rationality." As argued in this chapter, it is impossible to propose an equitable method of research in denial of the very terms of reference
upon which the research process, in general, is based. Similarly, one cannot authenticate the informant, in this case the essential point of view of the "oppressed" subject, for one must always consider that the very process of writing is poetic (and political).

In acknowledging the creative aspects of the research process, the researcher must find ways of doing research that neither neutralize her/his involvement in an effort to produce "truth" models, nor essentialize the informant as experienced "authority." This is precisely why an epistemological reckoning, as prefaced here through the contributions of feminist practice, is required in order to make responsible knowledge claims. We simply cannot reproduce research methodology in the mirror of value-neutral objectivity. The question remains, "whose version of value-neutral objectivity is this?"

With feminist practice as a guide, I would like to critique our inheritance of "objectivity" and "truth" models. In Chapter Three I combine Donna Haraway's essay "Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective" with research into the development of the modern observer, as traced through nineteenth-century techniques and technologies of perception described by Jonathan Crary in <u>Techniques of the Observer</u>. Feminist epistemology and nineteenth-century visual practice are odd bedfellows in this attempt to show that our techniques of observation, including notions of "objectivity" and "rationality," are neither ideologically dependent, nor are they "natural." Rather, technique is embedded in the complex overlap of historical, cultural and social circumstances.

Chapter Three

Visual Technique and Epistemology as "Production"

How do technique and technology in history engage in the production of ways of knowing? "Production" is used to suggest a collaborative process resulting in an "effect," and is in this wav intended to resist "construction" metaphors associated with humans as tool-makers and tool-users. What I have tried to encourage in the first two chapters of this work is a way of approaching knowledge claims that neither regards them natural traditional as (as in conceptions of "objectivity"), nor observes knowledge as constructed through ideology and control. I interrogate narratives of progress, determination and pre-determination in order to contend with the more involved issue of how our ways of seeing are produced in relation to a patchwork of circumstances. That is, to contend that all knowledge is a result of human construction is a polemic which continually reproduces, or reconstructs itself, and does not escape the circularity of knowledge as an orchestration of human design. To argue that there is a natural and organic concept of "rationality" in this way privileges the position of select observers as those who are outside of social, cultural, and historical relations, and therefore "naturally" in a position to decide upon and deliver "truth."

Herein is the problem of the observer. A critical approach to this problem requires dislodging the production of knowledge from the quantitative, and imputing to 1t qualitative forces of social, cultural, and historical movements which in recombination comprise techniques, technologies, and modes of seeing. "Truth" does not appear unproblematically in the world as if "natural" and predetermined. Nor is it something "we" make when we need it, as if to say that we maintain absolute control throughout processes of knowledge claim-making. On the contrary, we are not out of control. As Kuhn has pointed out, we must acknowledge the complexities at work between negotiating the rational and the not-rational. A discussion of this calibre engages questions about epistemological formation.

Epistemology is the documentation of ways of seeing in Walter Benjamin, it culminates history. For in an investigation of sociohistorical memory, out of which material history is reconstructed as philosophy (Buck-Morss, 55). History of knowledge comes to the surface in the material spatial and temporal traces and residues of "truth": architecture, technology, social and cultural formations. History, therefore, is not pre-determined, as if by master plan, and presented to the observer. As I argued in Chapter One, history does not proceed the "event" as narrative, as progress report. Rather, Benjamin's conception of history evokes montage, the bringing together of disparate and

fragmentary events in retrospect (Buck-Morss, 73-7). It is always out of backward-looking that we make history, where time is not the playing out of a progress narrative. Instead, the passing of time is fragmentation and disintegration.

Jonathan Crary situates the modern observer as both a product of, and constitutive of, modernity¹. That is, the observer is in process, and is not outside of circumstance to look down upon or inward on the world. The observer is in-theworld, reconstituted through social, technical, and cultural practices, and reconstitutive of social, technical, cultural practices. In this respect, Crary is careful to point out that "natural" distinction between "realism" and there is no "experimentalism," where science and art represent separate intellectual spheres, but that there is a communicative relationship between the two which significantly disparages this binary distinction. His project, to investigate the interconnectedness of technical and aesthetic practice, rejects a notion of an omnipotent, "objective" observer in the value-neutral sense and shifts to a conception of the observer as one who, to borrow from Donna Haraway, is "non-innocent." He uses Benjamin's concept of history, as prefaced above, in order to make this argument.

¹ See Crary, 9. Crary specifically states his purpose "to delineate an observing subject who was both a product of and at the same time constitutive of modernity in the nineteenth century," uprooting the modern observer from a distanced objectivity, and relocating him/her in the techniques and technologies of vision of the nineteenth century.

Susan Buck-Morss' reconstruction of Benjamin's **Passagen-Werk** in <u>The Dialectics of Seeing</u> and Jonathan Crary's documentation of the problem of the modern observer in <u>Techniques of the Observer</u> resonate with the present work in several instances. Crary, Buck-Morss, and Benjamin evoke methodologies that release historicity and materiality from traditional epistemological narrative. All three emphasize both the relationship between history and culture, and the problems implicit in creating narratives. Thus, each shares with my work a concern for how we think about, and put together, a history of time past. This approach bypasses a representation of history as the stringing together of events, and opts for a conception of history as the complex patterning of "effects" as traced through technical, social and cultural practices.²

A second moment of resonance is identified by Crary as something that he does not address in his study of the modern observer. This would be "the marginal and local forms by which

Crary is highly dependent on visual practice in order to make this point clear in his work. I would like to acknowledge the problem of relying strictly on vision and the visual to explain the problem of the modern observer. Crary discusses vision in exclusion of consciousness, and, therefore, a gap remains between the "seeing" and the "believing" capacities of the mind. This is a complex problem that cannot be given adequate attention in the time allotted for masters research. It is important to keep this question in mind when negotiating the gap between vision, consciousness, and discursive production. That is, do we see in isolation of a mind? If not, (and I argue that this is the case) how can one account for a seemingly innocuous metaphor such as "seeing is believing?" Crary does not even begin to address this problem in his work.

dominant practices of vision were resisted, deflected, or imperfectly constituted" (Crary, 7). While the present study does not attempt to pursue a history of nineteenth-century techniques of visual subversion, it does locate a subversive tactic in twentieth-century feminist critiques of "objectivity", and a feminist proposal for a different sense of "objectivity" that could reclaim for itself a notion of "good," as opposed to ideals of "truth" in vision.

It is for this reason that I choose to recombine Crary's thoughts on the observer in modernity, as influenced by the work of Benjamin and in harmony with the ideas of Buck-Moiss, with the contemporary work of Donna Haraway. In this final chapter, I draw from Haraway's "Situated Knowledges: The Science Question in Feminism and the Privilege of Paitial Perspective," and Jonathan Crary's book to examine how the ideas of each augment the other, and in so doing respond to concerns raised in the preceding chapters: the problem of the observer and "objectivity."

Patterns of resistant visual practice in the nineteenth century, although not explicitly investigated in my study, reveal themselves in feminist criticism of scientific method. The present study, therefore, begins to work backward from current feminist criticism to a point at which one might begin to understand how dominant visual practices were resisted and imperfectly constituted in the nineteenth century, traces of which, I argue, surface in current feminist critical practice.

Situating Knowledge

Donna Haraway voices concern for a responsible means of vision by which to reclaim notions of "objectivity" for a new science based on feminist ideas. Her discussion responds to a nineteenth-century obsession to both see, and to be seen, including pysiological research into the human body in order to make this "body" conform to the everyday demands of industrialization and technologization. She cites twentiethcentury visual practice to disclose a teaming desire to experience visual splendor as the object of knowing. For Haraway, this "splendor" extends to the domains of outer space and inner space as conquerable frontiers of knowledge, where celestial and biological bodies are visual proof of the unknown, yet seemingly not of the unknowable. It is this illusion of infinite vision that she wants to put to work. through metaphorical connection, as powerful visualizing techniques for a "usable, but not an innocent, doctrine of objectivity" (Haraway 1988, 582). She expresses her purpose as follows:

I want a feminist writing of the body that metaphorically emphasizes vision again, because we need to reclaim that sense to find our way through all the visualizing tricks and powers of modern sciences and technologies that have transformed the objectivity debates. (Haraway 1988, 582)

Have these "powers" transformed, or rather formed, the objectivity debates that she writes about? Arguably, there is a culturally specific Cartesian inheritance that can be read

through our contemporary desires both to know, and to search for unity and coherence in epistemological story making, where a mechanical approach to thinking processes synthesizes moving parts in order to make sense of the world. The mind, in comparison, is a machine that facilitates a variety of processes, of which vision is a mechanism. What this suggests is that perhaps the mind is a locus of exchange, a relay point through which a variety of signals pass, and where a variety of "effects" is produced, vision being one. Ironically, knowing is paired with a philosophical insecurity of not knowing: critics express the predicament of needing-to-know in the face of debates about knowledge as a human construction. For Haraway, a way of breaking out of this circularity of nature/construction is to localize and to situate knowledge as: "embodied" (although she specifies not necessarily organic embodiment and including technology). She continues:

So, not so perversely, objectivity turns out to be about particular and specific embodiment and definitely not about the false vision promising transcendence of all limits and responsibility. The moral is simple: only partial perspective promises objective vision. (Haraway 1988, 582-3)

This places one at a very important crossroads in this discussion, and entertains the demand for a contextualization of Haraway's use of "partial." Is partial to be conceived of

³. See Richard Rorty, <u>Philosophy and the Mirror of Nature</u>. Here, Rorty elaborates this predicament of knowing against the contentious philosophical position of "construction" as an alternative to "natured" truth.

in the tentative sense, as in resistance to confirmation of revision "feminist" definitive response to а of any "objectivity?" That is, travelling, not a and wholly empathetic "objectivity," but an incomplete one? Or, does partial connote contingency in which defining "objectivity" requires that it be assessed in association with, or judgmentally relative to other factors--a concept of "objectivity" that is contingent upon experience? These questions are not meant to be rhetorical. I ask them as a means by which to combine the ideas of Haraway and Crary. As I discussed in the second chapter of the thesis with respect to Sandra Harding, a strong sense of objectivity relies on contingency to a certain extent, but only in so far as contingency is not universally and judgmentally relative, but in so far as it is embedded in social, cultural, and historical practice--situated. Similarly, the tentative humor of Donna Haraway's approach is both incomplete, and committed if, for example, one were to assess her arguments in the context of James Clifford's notion of partial "truths."

With these questions in mind, I would like to trace Donna Haraway's philosophical position through techniques of vision as researched by Jonathan Crary. To recombine the philosophical, technological, and physiological suggests a course of epistemological development that, although circumscribed in this work as twentieth-century feminist writing, connects with nineteenth-century technique. It is an epistemological inheritance, as well as a culturally specific technique of observing that neither Haraway, Crary, nor any of the other philosophical positions raised in this thesis (mine included) are absolved of.

What is most interesting about Crary's work is that while he embarks upon a critical inquiry of the modern observer, he lifts his critique from ideological biases, and shifts to quantitative and physiological studies of vision in order to return his argument to the qualitative. Residues of these techniques, as I have suggested above, reappear in locations of non-privileged visual perspective: feminism and discourses of the "other." Where, then, is the making of the "feminist" observer in modernity, or more generally so as to avoid an essential polemic, the making of the "other" as observer in modernity? And further, how is this "otherness" differentiated in feminist critiques and theories of objectivity?

The Making of the Modern Observer

There is a moment in the early nineteenth century at which vision, philosophically positioned outside the body in the centuries previous in terms of the "truth-based" visual technology of the camera obscura, ⁴ shifts its location to the

⁴ The camera obscura was an apparatus denoting a "fully objective equivalent of natural vision." Based on the concept of an enclosed interior into which light would pass through a small hole to illuminate an inverted image on the wall opposite the hole, the camera obscura represented the possibility for clear and direct perspective of a knowing subject on the external environment. For a general overview of the camera obscura as a technique for

body. The camera obscura was a visual model based on the design of a chamber separated from the field of observation in which the observing subject, enclosed in the chamber, was distanced from the object of investigation in order to establish a direct and "truthful" line of objective vision. The shift in the nineteenth century is away from this camera obscura model geometric perspective of the to physiological perspective in which the once distant observer is plugged into the circuit of observation, thus becoming increasingly susceptible to scrutiny as an object of vision. This is most evident in physiological investigations into the eye, blindness and sight studies, retinal afterimages and theories of colour. Crary brackets Goethe's colour theory as an important event distinguishing modern observation. Goethe's theory marked a separation from the classical model of the camera obscura that, in comparison, signified a totalizing view of the senses.

Goethe used the model of the camera obscura as the basis for his optical studies. Rather than maintain levels of light in the chamber derived from passing through the observation hole, he sealed the observing subject in the chamber so as to cultivate an atmosphere of absolute darkness. As cited in Crary, Goethe framed the experiment as follows: "Let the observer look steadfastly on a small coloured object and let it be taken away after a time while his eyes remain unmoved; the spectrum of another colour will then be visible on the white plane...it arises from an image which now belongs to the eye."⁵ The body of the observing subject, until this time excluded from optical experiments, joins the circuit of affect and becomes an active producer of optical experience. What this reveals is the possibility of an observer who is both subject and object of vision, one who is simultaneously the producer of his/her own visual experience and one who is also the object of empirical research in the nineteenth century. Crary summarizes the epistemological significance of this research:

What is important about Goethe's account of subjective vision is the inseparability of two models usually presented as distinct and irreconcilable: a physiological observer who will be described in increasing detail by the empirical sciences in the nineteenth century, and an observer posited by various "romanticisms" and early modernisms as the active, autonomous producer of his or her own visual experience. (69)

Goethe's colour theory shows up in Benjamin's **Passagen-Werk** in which Benjamin borrowed from Goethe's writing on the morphology of nature the concept of ur-phenomenon--the emergence of colours out of light and darkness.' For Benjamin, Goethe's importation of Platonic essence and appearance to

⁵ See Crary, 69-75. See also Johann Wolfgang von Goethe, <u>Theory of Colours</u> (1840), trans. C. Eastlake (Cambridge, MA: MIT Press, 1970).

⁶ Buck-Morss, 71-72. Here Buck-Morss cites Goethe's writings on the morphology of nature from Georg Simmel's <u>Goethe</u>, 3rd ed. (Leipzig: Klinkhardt & Biermann, 1918): 56-57.

biology so as to reveal self-evident objective laws and regularities in structural forms was central to his own research on the arcades. Goethe evidenced ideal principles in the structure of living things, and on the basis of this believed he could make distinct connections between archetype and structure. That is, in objects one could find theory, and thus, the objective and the abstract (at least in biological studies) shared a connection of proximity. What is most significant about Goethe's ur-phenomenon was that the location of theory in objects (the bringing to colour out of light and darkness) meant that a boundary dividing inside and outside, a division necessary for the camera obscura to work, was blurred. The possibility of an omniscient observer distinct from the external visual field, and therefore in control over that field, was challenged by the theoretical precedence of objects.

The unity of subject and object is what makes the idea of a "subject" a dilemma in the first place. Up to this break in the nineteenth century, the position of the subject was approached unproblematically. With the paradigm suggested by the camera obscura, the possibility of a "truth"-seeing observer was neither rejected, nor interrogated, but rather, assumed. We are presented with a schema of fixed subjects and objects that are locked into position, as well as the model of an observing subject who presides over the objective world. In comparison, Goethe's colour theory begins to draw attention to

the importance of the object; however, the intricacies of the communicative relationship between subject and object remains a problem. The clues are in the mobility and the circulation of the subject in-the-world, and the comparable transience of objects in-the-world. This is how Benjamin brought Goethe's ideas to his study of a nineteenth-century subject in relation to the Paris arcades.

Benjamin's Appropriation of Goethe's Ur-phenomenon: Dissolution of Inside/Outside

Benjamin used ur-phenomenon to explain how the origins of the present could be revealed in moments of the past, where ur-phenomenon were located in verbal and pictorial representations, the evidence of transient historical objects of the nineteenth century. Benjamin drew from Goethe's biological research to illuminate his sociohistorical research of the twentieth century, using insights into the human body as a stepping stone for understanding that body in circulation throughout the Paris arcades. In so doing he wanted to reveal immediacy of experience without mediation, an and the possibility of human influence on events in order to challenge pre-determined narratives of progress and development. Benjamin identified a communicative relationship between inside/outside, and in effect disturbed the cultivated precedence of this division. Historical materialism was a means by which to challenge the mythical notion of progress:

It can be considered one of the methodological of this [Passagen-Werk] objectives to demonstrate a historical materialism within of progress the idea has which been Precisely annihilated. on this point historical materialism has every reason to distinguish itself from bourgeois mental habits. Its basic principle is not progress, but actualization."

The dissolution of inside/outside and its relevance to nineteenth-century empiricism is a philosophical paradigm that breaks from the earlier technology of the camera obscura. The observer in the camera obscura, although part of the observation device, was never the subject of scrutiny. Rather, this observer experienced a "flooding of the mind by the light of reason" (Crary, 43), the Cartesian mind's unique perception of the external world.

Here we have a paradigm in which knowledge descends from a point of origin outside of the body. The subject's claims to knowledge transcend corporeality, evoking an illusive and hierarchical power. It is not surprising that metaphors suggesting an infusion of the mind by light are used to describe the status and position of the subject. What makes this infusion believable is the epistemological possibility of an observer who is distinctly separate from the world of observation. It is

Brackets mine. This passage appears in Benjamin's original notes on the **Passagen-Werk**, as quoted in Buck-Morss, 79. Buck-Morss' reference citation to the original notec is V, p.574 (N2, 2) **Passagen**. See her Introduction to Part II of <u>The Dialectics of</u> <u>Seeing</u> for a guide to the cataloguing of his notes.

a paradigm that was kept in place by the demarcation and preservation of boundaries. Seventeenth-century epistemology, therefore, was still invested in concepts that sustained distinct divisions between inside/outside, and it was on the basis of this distinction that the observer was privy to a direct line of vision outward on an object, yet not subject to a return gaze. The observer was the connector of points along the visual spectrum, where object and observer upheld opposite ends of this line of vision.

In the nineteenth century, technology and philosophy merge with social and cultural formations to make an observer who simultaneously occupies a privileged position of autonomous vision, yet at the same time is an object of vision. The observer is imported to the visual apparatus as operator of the machine. However, it is through research into the mechanics of human vision and its physiological composition that a host of new visualizing techniques enter the "dream" markets of the nineteenth century. The stationary and focused observer of the camera obscura shifts to a more diffracted sense of perspective in the nineteenth century. The new "subject" accommodates a variety of visualizing devices, all of which were connected to physiological insights on

the function of the eye." I will not go into detail about these devices and their origins, however, I would like to draw attention to one of these devices, the stereoscope. It is with stereoscopic technology that we can begin to identify most clearly the separation of the senses, and the way in which the eyes consolidate planes of vision to focus on an object. The stereoscope represents a distinct shift from the paradigm of the neutral, Cartesian observer in the camera obscura to paradigms requiring an increasingly mobile and participatory observer. It is this paradigm shift that I argue contained the epistemological potential for a twentieth century-feminist critique of science and objectivity.

Stereoscopic Vision

The stereoscope was a hand-held viewing device through whose lens the observer was able to see a threedimensional image derived from that same observer's synthesis of two distinct images opposite the lens,

^{&#}x27;Crary notes several studies on vision, including work of Goethe (as already discussed) and Schopenhauer in the nineteenth century; the Molyneux problem in the eighteenth century that addressed the crossover of tactility and vision, in which it was supposed whether or not a perceiver ignorant of one of the senses, namely sight, once returned to sight, could identify objects by sight alone; and the eighteenth-century case of the "Chesleden boy", blind at birth and restored to sight during childhood. See both chapters "The Camera Obscura and its Subject" and "Subjective Vision and the Separation of the Senses" in Crary, 25-66; 67-96.

approximately at a distance of arms length. In devising the stereoscope, Crary explains, "Wheatstone aimed to simulate the actual presence of a physical object or scene, not to discover another way to exhibit a print or a drawing" (122). That is, he wanted to investigate the technical principles of visual perception of solid objects, and to see how this perception differed from painting perception. His purpose involved narrowing the distance of perception while conceiving a threedimensional effect, something that painting and existing technologies of the period⁹ had only sufficed to represent in two-dimensional form.

The critical turning point in stereoscope technology came about with discoveries in binocular vision and with supporting evidence that each eye sees a slightly different image (Crary, 119). If each eye is attuned to a slightly different image, how does the observe) experience the synthesis of a single image? Evidence of binocular vision came out of Wheatstone's measurement of binocular parallax, the difference of the axis angles of each eye when focused on the same object (Crary, 119). When distance is a factor, the axes of each eye equalize to a parallel point such that at a distance the object appears the same to both eyes as if it were only viewed

^a Crary cites at length evidence of the diorama, phenakistiscope, zootrope, kaleidoscope as experimental visual devices of the nineteenth century.

by one. In this respect it is possible to see how the camera obscura could have been conceived as a "truth" model, when at a distance, as discovered centuries later, the eyes could consolidate singular, and distinct images. Wheatstone was not concerned with this parallel synthesis at a distance, but rather wanted to reach conclusions based on objects viewed at shorter distances, and to see how the eyes accommodated the differential between axis angles. Binocular vision as a physiological technique, it was discovered, tricks the mind into believing its perception of objects is at once complete. As Crary continues, "thus physical proximity brings binocular into play as an operation of vision reconciling disparity, of making two distinct views appear as one" (120).

In terms of the stereoscope, what this implies is that the image seen by the viewer is derived from the viewer's experience of the object, including the physiological workings of the eye and the eyes' consolidation of multiple planes of vision. The object, rather than appear truthfully and immediately to the viewer, is the effect of the observer's experience. The final image is the result of the convergence of several planes of vision: two eyes whose differential axes of binocular vision produce two slightly different planes of vision; the two images opposite the lens of the stereoscope out of which comes the three-dimensional effect; and the lens of the stereoscope. What is produced is a "reality effect," the immediacy of experiencing space between objects, as if the viewer is present in the image. The coherence and homogeneity experienced by the viewer are not logically oriented, but rather dre d production of a variety of elements that when added together outside of the effect do not share dry connection, much the same as the effect of a patchwork quilt."

What this suggests is precisely that what you **see** is what you **make**. I emphasize "see" and "make" here, for I would like to draw attention to a possible error in assuming that seeing and making are aspects of a human as-tool-maker philosophy in which our reality is at once a fabrication along the lines of being socially constructed. Likewise, I draw the reader's attention to the polemic of assuming a relativist position whereby

¹⁰ In other words, the effect is that of disparate element: which on being divided bear no logical connection to each other in terms of spatial criteria, for example objects in the background appearing much larger than objects in the foreground yet when viewed as a single image there is an illusive yet logical coherence. The stereoscope, therefore, functioned on the basis of disunity as opposed to unity. As Crary writes, "The reading or scanning of a stereo image, however, is an accumulation of differences in the degree of optical convergence, thereby producing a perceptual effect of a patchwork of different intensities of relief within a single image. Our eyes follow a choppy and erratic path into its depth: it is an assemblage of local zones of three dimensionality, zones imbued with a hallucinatory clarity, but which when taken together never coalesce into a homogeneous field" (125-6). See also Deleuze & Guattari, 4/4-500.

"truth" is dependent on coordinates of time and place, and objective vision is always measured by the relation of points to each other in space and time. The connection between seeing and making is more akin to a production of disparate elements, like the planar disunity of the stereoscope, where I use "production" to describe a process of overlapping (not the additive sum) practices. These practices include technical, social, cultural, historical, and in the case of nineteenth-century experiments on the ocular, physiological circumstances. The importance of the stereoscope as a single surface on which direct point of view was challenged also feeds into epistemological conceptions of objectivity. Crary continues:

The stereoscope signals an eradication of "the point of view" around which, for several centuries, meanings had been assigned reciprocally to an observer and the object of his or her vision. There is no longer the possibility of perspective under such a technique of beholding. The relation of observer to image is no longer to an object quantified in relation to a position in space, but rather to two dissimilar images whose position simulates the anatomical structure of the observer's body. (128)

What the philosophical underpinnings of the paradigm of the stereoscope mean for epistemology is that the concept of "knowing," in centuries previous based on point-to-point adjudication, is made as disparate as the observer's synthecies of a stereoscopic image. "Objectivity," much less based on "truth," is a produced effect. To conceive of point of view in terms of a production of elements suggests a possibility for avoiding the extreme of judgmental relativism. Relativism in this case drives objectivity to eclipse issues of responsibility in judgment. "Objectivity," seen in terms of "effect," engages debates that critique knowledge as social construction by including such disparate elements as the physiological and the technical.

Production, therefore, is not the additive sum of separate elements to create a coherent whole, but rather is the effect of a variety of overlapping and participatory factors. There is a distinction to be made here between "overlapping" and "additive," a particular point of contention that is, however, an important one. An "additive" metaphor suggests a connective and linear approach to intellectual practices. Addition connotes a tone of completion and organicism in which there are distinct beginnings and endings, and points of fusion between elements. To overlap, in contrast, evokes metaphors of the incomplete. That is, practices fold over each other in a way that disturbs linearity, making it difficult to establish fixed boundaries and points of origin. Likewise, "overlapping" lessens the significance of depicting circumstances of direct cause and effect, and it challenges the logic of such a movement. Thus we are presented with the potential for hidden discontinuity and continuity in analyses, obfuscating "truth"-oriented practice in favour of polysemy. It is out of such a conception

of vision that we may do away with cause/effect and direct perspectives of objectivity, and work toward differentiated, yet responsible, ways of reclaiming the "good" in concept of "objectivity."

Responsibility in "Objectivity"

In response to objectivist doctrines of neutrality, Donna Haraway shatters all notions of passive vision. She argues that the modern, technological "eye" and our "organic" eyes are anything but passive visual receptors of a world that to life before these "eyes," and beyond our comes intervention. Accounts of ubiquitous vision that are neutral in their ever-presence are exactly the kinds of visual metaphors and tenants of objectivity that Haraway singles out as "irresponsible" and "unlocatable." On the contrary, vision is not without recourse to mediation, where our visual possibilities are "highly specific," and absolutely situated. "Situatedness," therefore, is the ability to see from the other's perspective, not in terms of an empathetic drive to understanding through mobility and interchangeability as if to denote mechanical processes, but rather in terms of a radical specificity of our own subject positions. Specificity, rather than essentialism, denotes the coupling of distance and difference--differential vision.

The camera obscura paradigm depicted a point of view and direct line of vision for "truthful" interpretations of the

physical world. The kind of specificity in objectivity that Haraway wants to operationalize takes its cues from a discontinuous and non-unified paradigm of the stereoscope, where vision plays to a variety of technical as well as social practices. Her methodology does not venture directly into nineteenth-century visual technique, and in fact it is this downplaying of history that both distinguishes her work from Crary's and provides an opening for bringing the two together. The way in which Crary discusses the "making" of perspective based on intersecting and overlapping planes of vision of the stereoscope and its operator, and the way in which Haraway wants to incorporate the technical and the social, including destabilizing and differential sightings as a means of "embodying feminist objectivity, " share points of contact that directly challenge disembodied, point-to-point, coherent doctrines of objectivity.

Hers, then, is a "non-innocent" doctrine of objectivity. By bringing to the visual body the concepts of difference, incoherence, and diffraction, Haraway, without commenting on the technical aspects of vision, alludes to the many disparate elements which make illusionary a sense of coherence in vision, as discussed in the case of stereoscopic vision the concept of multiple planes of vision. The stereoscope, heavily dependent on the discovery of binocular parallax, is a valuable metaphor for understanding nineteenth-century epistemology. Similarly, Haraway's emphasis on satellites and digitally transmitted signals, which produce photographs of a world above and beyond our "eyes," is a valuable metaphor for understanding twentieth-century shifts in epistemology. What separates these metaphorical locations is precisely the contemporary call for differential social sightings that transgress the bourgeois parlours of the nineteenth century and resurface in non-privileged locations of feminist and post-colonial critique.

It is precisely this necessity for the immigration of the non-privileged and always "other" to late twentieth-century epistemology, where I include feminist critiques of science in this divide of non-privilege, that requires one to pay close attention to what we might mean by "non-innocent" notions of "objectivity." Shifting our focus from the privileged to the non-privileged and romanticizing the situations of the subjugated in order to embellish radical critique is not wichout its problems. As Haraway states very clearly, "how to see from below is a problem requiring at least as much skill with bodies and language, with the mediations of vision, as the "highest" technoscientific visualizations" (1988, 584). "Non-innocence," therefore, is a concept that is very much connected to the body. That is, we all have bodies and cannot assume an infantile naivete when it comes to talking about our bodies in association with vision, probing, and knowledge embodied objectivity is all about making inguiry. An responsible knowledge claims, as these are situated in our

bodies, with our bodies situated in worlds. It is not a relativism where all knowledge is measurable against specific times and places as points on a grid. Rather, embodied objectivity is intent upon the mobility in location and situation that is imbued with a potent sense of immediacy. This mobility takes its cue from our shifting visual paradigms of which satellite technology is an example.

What we have to ask ourselves is, do we consider our visualizing technologies, our links to "objective" analyses, as protheses for obtaining clear pictures of the world, or are they rather something different? I think the answer to this question has been alluded to on a variety of occasions in this chapter, and it has to do with "how" the observer is situated in the circuit of observation. This is Haraway's point: that we are not outside of our technologies in which we use them as tools, but on the contrary we share a hybrid connection to them.¹¹ I return once again to the observer in connection with the stereoscope. It is not by illusion that the three-

¹¹ This is the point of Haraway's essay "A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century" cited in Donna Haraway, Simians, Cyborgs and Women. In the Introduction to this volume she provides her working definition of cyborg: "A cyborg is a hybrid creature, composed of organism and machine. But cyborgs are compounded of special kinds of machines and special kinds of organisms appropriate to the late twentieth century. Cyborgs are post Second World War hybrid entities made of, first, ourselves and other organic creatures in our unchosen 'hightechnological' guise as information systems, texts, and ergonomically controlled labouring, desiring, and reproducing systems. The second essential ingredient in cyborgs is machines in their guise, also, as communications systems, texts, and selfacting, ergonomically designed apparatuses (1).

dimensional image appears to the observer, but it is in fact by becoming part of the apparatus, incorporating the differential implicit in binocular vision with the differential planes of the technology, that the effect is produced.

Our contemporary techniques for visualizing are not prostheses for "truthful perceptions of the world, as in the camera obscura, and similarly are not illusion machines by which we trick our eyes. Rather, they are incomplete technologies that require active participation (including language and bodies) in order for their "effects" to be produced. Finally, I quote Haraway on the partiality of the observer in his/her collaborative relationship with visual probes:

The knowing self is partial in all its guises, never finished, whole, simply there and original; it is always constructed and stitched together imperfectly, and therefore able to join with another, to see together without claiming to be another. Here is the promise of objectivity: a scientific knower seeks the subject position, not of identity, but of objectivity, that is, partial connection. (1988, 586)

A Postmortem on History, Technology and Rationality

I return to a question I asked in the introduction to this chapter: how do technology and technique in history produce ways of seeing? The collapse of the camera obscura paradigm provided the necessary conditions for the "experimental" and the "real" to engage in a paradigm of produced, as opposed to self-evident, "truth" claims. "Pationality," rather than be conceived of as a pre-determined state, is also a "production" of technological and physiological vision, situated and positioned. "Rationality" does not come from above, but instead moves laterally, susceptible to disturbance, interruption, and fracture.

In this scenario of partial connection, historical analyses and excavations into the past are a delicate (however, important) point of contention. How do we talk about history without turning it into a disembodied testimonial to time past, the documentation of stories of great people, places and events from either positions of privilege, or their subjugated counterparts? Can the historical knower seek a similar subject position of objectivity as the scientific knower when the very notion of history is itself already objectified, of other time, of other place? Yes. That is, if we regard history as immediate and presently oriented, as something that is not in the past, but rather, as that which present, always contestable, open the to exists in interpretation, and to the critical "eye." Likewise, there is no such thing as "innocent" history, and I think feminist critiques as subversive visual techniques can ably attest to this.

I have tried to position the work of feminist critiques of science, notably the work of Donna Haraway, as late twentieth-century proof of how certain nineteenth-century

visual techniques were imperfectly constituted. Haraway's concept of "situated knowledges" resonates with a separation of the senses in physiological and technical studies in vision from the previous century. Thus, the imperfect constitution of visual practices in the nineteenth century, as alluded to by Crary, reveals itself as a residue in a reconfiguration of "objectivity" by twentieth-century feminists. It is by way of nineteenth-century empirical models, which ironically were derived from period developments in the knowledge of vision, that Haraway is able to return to connection with nineteenthcentury paradigms through twentieth-century feminist epistemology. Twentieth-century feminist practice is a radical epistemological shift that was imperfectly constituted in the previous century.

Chapter Four Conclusion

In this thesis I have attempted to draw out issues integral to studies in epistemology. Using Thomas Kuhn as an entry point, I argued that the way in which we make our knowledge claims is not outside of culture and history, but rather is embedded in these processes. History, to take this argument further, is not the linear unfolding of a set of predetermined events. History is the production of ideas, as are ways of seeing, techniques of observation, epistemology. I have tried to resist replacing narratives of progress with a narrative of human construction in which all that we see and all that we do is derivative of some kind of human "handicraft." The world is simply (and complexly) not this deliberate.

What this complexity suggests is that cause/effect proposals, and arguments based on ideological control surrender responsibility and accountability in their efforts to provide whole stories, and "truth"-oriented analyses. The difference resides in process-oriented research methods, where methods based on predictions concerning results-oriented research escape relevance. That is, comparing points "A" and "B" as initial and finished states are challenged with investigations into the overlap of influential circumstances that reside in the gap between these points. Put another way, it is the difference between regarding a line as that which connects two points, and raising the importance of points as sites through which lines pass. The camera obscura and stereoscope, respectively, are technical examples of this shift in observational technique, or in terms of a Kuhnian response, paradigm shift.

Current feminist practice demonstrates an epistemological shift in perspective from "truth"-oriented, point-to-point adjudication to multi-dimensional technique. Sandra Harding and Donna Haraway, in particular, invest in discourses of partial perspective and the non-privileged, or "other," in this regard. Haraway uses visual metaphors to explain how science studies has made privileged notions of "true" and "false" appear to be natural. Her response to these unruly positions of privilege is one that fictionalizes the notion of "nature" and draws attention to the ways in which visual perception is both multi-dimensional and partial, absolutely embodied. That is, we do not look out upon the world as if it is separated from us by a microscope or some other probing device. With our technical capacities to probe celestial bodies externally, and internally probe biological ones, the boundary between inside and outside is absolutely blurred.

In identifying the blurring of this boundary distinction, the dismantling of binary oppositions, with an awareness of cultural, historical and social polysemy, technology becomes

significant. Technologies do not determine the way in which we see the world, nor are they prosthetic filters through which we observe the world around us. Technology, in general, maintains a logic that resonates with the ongoing reorganization of social, cultural, and historical circumstances. It is no wonder, therefore, that Donna Haraway evokes satellite imagery and radiation wavelengths to establish her epistemological positioning.

With a comparable understanding of the "situatedness" of the observer, Jonathan Crary cultivates a partnership between optical history and epistemology. Both Haraway and Crary are intent on breaking down the barriers that have succeeded in producing binary schedules. For Crary it is the supposedly "natural" separation of "experimentalism" and "realism" in artistic and technical practice, respectively, that preserve binary opposition. For Haraway, it is the "natural" attitude with which the sciences (and politics, and society, etc.) reproduce gender binaries and hierarchies, and cultural binaries and hierarchies, that preserves oppositional structures. Both contend that these "naturalisms" must necessarily be "denatured, ' and therefore proceed to elucidate this problem through discussions of visual technique and practice.

This brings me to address the importance in communications studies, in which many of us rely upon visual technologies to make our research projects, of establishing

responsible and accountable ways of using "objectivity" as a category of analysis. Our research results are only as good as the methodological techniques we employ. Thus, an apparent irresponsibility in technique significantly affects the reliability of results. This requires that one ask the following kinds of questions: Can I make assumptions about how the world works based on a statistical and/or visual representation? Because I see something, does this necessarily preclude an understanding of it? How does the implementation of visual technologies such as video, film, or even computers shape the way in which knowledge is produced? Furthermore, can video and film be used as conduits of "reality?" And finally, how do the visual technologies we use, and visual representations we derive, play into the formation of academic disciplines in general? That is, why is it that we nave a discipline such as communications studies in this latter part of the twentieth century, where our access to the "everyday" is mediated through powerful visualizing techniques and metaphors?

These kinds of research questions draw attention to the fact that that seemingly simple problems are not so simple when we begin to address the methodological complexities involved in performing research. It is this line of questionmaking that I hope to have pointed out in my thesis, in which the problems of the observer and "objectivity" are just two examples.

In response to such "complexity," I do not see how any research proposal can ignore the contributions of feminist epistemology. I do not wish to make essential a category of "feminine," but rather I wish to point out the epistemological significance of feminist discourse and discourses of the "other." I do not make this claim without a situated subject position of non-privilege. I do not mean to suggest that someone without visible gender identification (since we all have a gender) or distinct characteristics of "otherness" (those of us who are not male or white, or middle class) is unable to make these arguments. On the contrary, I mean to address the problems implicit in responding to the hidden spaces of "otherness" by subscribing to an empathetic desire to "go native."

Methods driven by the infinite mobility and interchangeability of the observer are a "feel good" response to achieving "objectivity" in analysis. One cannot simply claim an understanding of the "other" without radically situating oneself as the observer. The choice is not to disengage perspective and sustain judgmental relativism but rather to maintain a radical specificity of subject position. In accordance, feminist critical practice has assisted in distinguishing a shift in epistemology in which we begin to "see" and make knowledge claims in terms of the partial and incomplete. The early incarnations of this epistemological shift reside in Thomas Kuhn's contributions to a history and

philosophy of science as prefaced in <u>The Structure of</u> <u>Scientific Revolutions</u>.

I would like to conclude with some considerations for further research as made apparent to me near the end of my project. What I have not addressed in this study is the relationship between consciousness, language, and vision. On the basis of my research, it has come to my attention that investigations into epistemological development, with particular emphasis on vision, must include a concept of "mind," and how "mind" works to engage in discursive and visual production. That is, the eyes do not operate in isolation of a mind, or nervous system, and likewise we do not put into language the things we see without some connection to the mind.¹ This significantly makes more complex very casual and causal assumptions such as "seeing is believing."

With these ideas in mind I would like to remind the reader that the thesis is both partial and incomplete. At any rate, I hope to have inspired further discussion in the area of epistemology, and to have suggested that knowledge claimmaking, and the establishment of ways of seeing are processes that perpetually and necessarily enfold a variety practices. Herein I situate the observer.

¹ Henri Bergson equates the process of the mind at work with the function of a telephone exchange. That is, the mind is a telephone operator and the nervous system is our hardware, wherein perception is sensory based, as opposed to intellectually determined. See Henri Bergson, <u>Matter and Memory</u>, 17-76.
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