# Why 1839? The Philosophy of Vision and the Invention of Photography

Didier Delmas Communication Studies M.A.

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## Why 1839? The Philosophy of Vision and the Invention of Photography

Didier Delmas Graduate Program in Communication Studies McGill University, Montreal June 2005

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#### **Abstract**

1826 is the date attributed to the very first known photograph, Nicéphore Niépce's "View from the Window at Gras." For traditional historians of photography this date marks the moment when the genius of man was finally able to merge the knowledge of chemistry with that of optics to create the most amazing technology of visual representation. However, those same historians recognize that the two essential components of photography – the camera and the properties of silver halides – had been known for centuries before the first photograph was ever taken.

This thesis explores two fundamental questions: Why wasn't photography invented soon after its major technological components were discovered c. 1650? And why was it invented in the early decades of the nineteenth century c.1830? This gap of some 200 years separating the feasibility of photography from its actualization has remained largely unexplained.

The answers to both questions is found by situating the genealogy of the invention of photography within the development of the Western philosophy of vision. The fact that photography was invented at the junction of the Classical and Modern *epistemes* offers a unique opportunity to approach the history of photography from the perspective of the history of thought. Hence this thesis takes its inspiration from the work of Michel Foucault and some of his followers –in particular Jonathan Crary and Geoffrey Batchen. The result of this radical shift from the technical to the intellectual environment allows the history of photography to transcend the narrow confines of technology and formal appearances. From a Foucauldian perspective I argue that photography was invented as a response to the epistemic instability experienced during the transition from the Enlightenment to Modernity.

1826 est la date qui marque la toute première photographie, Nicéphore Niepce's « Vue de la fenêtre à Gras ». Pour les historiens traditionnels de la photographie cette date est le moment où le génie de l'homme fut finalement capable d'intégrer le savoir du chimiste avec celui de l'opticien pour créer une technique de représentation visuelle étonnante. Toutefois ces historiens ont tous reconnue que les deux éléments techniques essentiels à la photographie – la camera et les propriétés des sels d'argent – étaient connues depuis plusieurs siècles avant que la première photographie ne soit prise.

Cette thèse explore deux questions fondamentales: Pourquoi la photographie n'a-t-elle pas été inventée peu de temps après la découverte de ses principaux composants techniques aux alentours de 1650? Et pourquoi fut-elle inventée dans les premières décades du dix-neuvième siècle vers 1830? Un espace de quelques 200 ans sépare la possibilité de la photographie de son actualité, espace qui reste largement sans explication.

Les réponses a ces deux questions a été trouvée en plaçant la généalogie de l'invention de la photographie dans le développement de la philosophie de l'Europe de l'Ouest. Le fait que la photographie fut inventée au croisement des épistèmes Classique et Moderne offre une occasion unique pour approcher l'histoire de la photographie a partir de l'histoire de la pensée. Par conséquent cette thèse s'inspire des écrits de Michel Foucault et de ceux qui l'ont suivi – particulièrement Jonathan Crary et Geoffrey Batchen. Le produit de ce déplacement radical de l'environnement technique à l'environnement intellectuel permet à l'histoire de la photographie de dépasser les limites étroites de la technologie et du formalisme. Partant d'une perspective Foucaldienne, dans cette thèse je soutiens l'argument que la photographie a été inventé pour répondre à l'instabilité épistémique connue au cours de la transition de l'époque Classique à l'époque Moderne.

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#### CHAPTER I

### TOWARDS A POSTSTRUCTURALIST HISTORY OF PHOTOGRAPHY

Walter Benjamin opens "A Short History of Photography" with this sentence: "The fog which obscures the beginnings of photography is not quite as thick as that which envelops the beginnings of printing" (Benjamin 199). It is certainly true that we know who, where and when photography was invented even if national or regional chauvinism still obscures some of the details. Was it Niépce or Daguerre? Daguerre or Talbot? Was it Paris or London? Was it 1826 or 1839? The debates keep on going but at least we know on which basis to take a position. There is one question, however, that raises little discussion and when it does the answers are quickly lost in conjecture. The question I am thinking of is one of timing: Why? Why did photography take so long to be invented? By the end of the first quarter of the nineteenth-century the camera<sup>1</sup> was several hundred years old and the general principles of the chemistry had been known for at least a 1 1/2 centuries, but during all that time no efforts had been expended to retain the natural images formed in the camera obscura.

The massive and erudite volumes that tell the story of photography (Eder, Newhall, Gernsheim, Frizot, Rosenblum, Lemagny, Warner, *et al*) generally place the origin of photography in the early European Renaissance. Not that they attempt to make us believe that photography already existed then but as a rule

<sup>&</sup>lt;sup>1</sup> The camera obscura, as it was called then by its full name, was essentially the same instrument from the late-1500s to the beginning of the twentieth-century, whether it was used to take photographs or to calculate perspective..

they show some minutiae drawings of a camera obscura and discuss the (re)discovery of perspective – believed to be the fundamental aesthetic characteristic of photography – by Italian draftsmen, in the 1400s. Those canonical historians even tell us that the sensitivity of silver chloride to the effects of sunrays was known as early as the mid-1500 – a discovery attributed to the alchemist George Fabricius in 1565. What they do not, or cannot, explain is why photography did not follow soon after those discoveries but had to wait until 1839.

When I chose the object of my thesis I went back to those large volumes canons of history of photography; and in particular to the one which appears to be their common ancestor, Josef Maria Eder's *History of Photography*. Eder was an Austrian chemical engineer and scholar whose thoroughly researched history was first published in 1886. The English translation of the fourth edition of Eder's work was delayed until the end of World War II. Eder's is the most substantive history of the chemistry of photography, beginning with the description of the Phoenicians' knowledge of the action of light on purple dye (8) and continuing with the findings of the Medieval alchemists. The Viennese chemist attributes the discovery of silver chloride – the form of silver halide used in photography for its sensitivity to light— to the Renaissance scientist Geog Fabricius. Eder does not date the origins of photography to Fabricius's 1565 discovery but builds a meticulous teleology of the medium's development up to the release of *Kodachrome* film by Eastman Kodak in 1928. Eder takes pain to establish a continuity of facts that includes the work of many famous figures like Roger

Bacon (1214-94), Porta (1538-1615), Kepler (1571-1630), Huygens (1625-95) and Newton (1642-1727).

Regardless of who was first doing what, histories of photography across the board place the observation of the action of light on silver halides at the latest in the mid-1600s. Eder, who provides the most thorough account of the evolution of the chemistry associated with the photographic process, gives the priority of the description of the darkening of silver salt when exposed to light to the alchemist Angelo Sala around 1614 (23). Eder also reports the later experiments conducted in the 1660s by the Irish chemist Robert Boyle in the discoloration of various dyes as a result of exposure to the air (30). In the same breath, in lieu of an explanation for a gap between the chemistry and optics of photography that wasn't closed until 1839, Eder notes that all of the scientists who studied optics in that period had simply "overlooked the effect of light on the intricate matter of nature" (31). For Eder that brief notice was enough to answer the question of the timing of the invention of photography. Admittedly until Johann Heinrich Schulze's experiments conducted between 1725 and 1727 (Eder 73, Gernsheim 22), the blackening of silver chloride by exposure to sunlight was attributed to heat rather than light. But even François Arago the French scientist and politician who delivered the official communication "giving photography to the world" admitted that the basic chemistry necessary to the invention of photography had been known for centuries. On July 3, 1839 Arago didn't forget to mention that fact in his presentation at the Académie des sciences:

> Ces applications de la si curieuse propriété du chlorure d'argent, découverte par les anciens alchimistes, sembleraient devoir

s'être présentées d'elles mêmes et de bonne heure ; mais ce n'est pas ainsi que procède l'esprit humain. Il nous faudra descendre jusqu'aux premières année du  $XIX_e$  siècle pour trouver les premières traces de l'art photographique. (Arago 467).

These applications of the very curious properties of silver chloride, discovered by the ancient alchemists, seem to have been presented of their own accord, and long ago; but this is not how human thoughts proceed. It will be necessary to refer to the first years of the 19<sup>th</sup> century to find the first traces of the photographic art. (my translation)

It is probable that Arago understood "human thoughts" to proceed according to the haphazard evolution of genius. Beginning with a different grasp of human understanding this thesis attempts to demonstrate that, far from the lack of genius in the seventeenth century, the invention of photography was held back by a particular conception of the relationship of humans with nature. The seventeenth and eighteenth centuries science and philosophy of vision couldn't possibly conceive the need for images that were exact duplicates of what the eye could see.

Although it was not kept secret, the research of the ancient alchemists may have received little publicity in their own time. The camera obscura on the other hand was a very well known and popular device. Its invention was placed sometime toward the end of the Middle-Ages and the beginning of the European Renaissance. The oldest known description of the instrument on record was left by Leonardo Da Vinci in 1490 (Hirsh 4) but the principle of the invention was variously traced to Aristotle's antiquity (Eder 36, Szarkowsky 11), to China of the fifth-century B.C. (Hirsh 4, Szarkowsky 12), or again to the thirteenth-century Arabian scholar Alhazen (Eder 37, Gernsheim 1).

The earliest camera obscura was nothing more than a box large enough for a person to enter. A very small opening was punctured on one of the sidewalls of the box; as a result an inverted image, of whatever exterior was facing the hole, would be projected on the surface of the opposite wall. Giovanni Battista Della Porta (1535-1615) was the first to describe a camera outfitted with a lens in the second edition of his widely read *Magea Naturalis* published in 1588. But Porta was not the first to add a convex lens to the camera obscura; according to Eder this distinction belongs to the Venetian Daniel Barbaro in 1568 (Eder 41-42). Meanwhile Mannoni gives precedence to another Italian, Gerolamo Cardano who, in his *De Sibilate* published in 1550, advocates the use of a biconvex glass to improve the brightness and sharpness of the images of the camera obscura (Mannoni 7).

From several descriptions left by artists and scientists since the Renaissance we now know that by the late seventeenth century the camera obscura had all the attributes of a modern camera (Gernsheim 15). It was a portable box sporting a lens on the front, inside a mirror at a 45-degree angle righted the upside down image which was projected on a frosted glass. Photographers of the twenty-first century will recognize in this description that of a modern SLR (Single Lens Reflex) similar to those popularized by American GIs upon their return from Japan after World War II. From the venerable Kodak Brownie first introduced in 1888 to the contemporary digital imaging devices weighting the shelves of electronics superstore, all cameras are optical devices based on the very principle implemented in Della Porta's own apparatus.

The question that naturally emerges from this brief overview of the history of photography is, of course: "Why wasn't photography invented earlier than 1839, or 1826, if one accounts for Nicéphore Niépce's first successful attempt?" It is a question that has eluded historians of photography since there has been a history of photography. One of the better known histories of photography Helmut and Alison Gernsheim's *The History of Photography from the Earliest Use of the Camera Obscura in the Eleventh Century up to 1914*<sup>2</sup>, tries to confront the mystery at the onset:

Considering that knowledge of the chemical as well as the optical principles of photography was fairly widespread following Schulze's experiments [1725] – which found its way not only into serious scientific treatises but also into popular books of amusing palour tricks—the circumstances that photography was not invented earlier remains the greatest mystery in its history (xxvii).

Like Eder, Gernsheim does not offer much of an explanation but at least it is an acknowledgement of the problem and perhaps a suggestion for future researchers to investigate this enigma.

Beaumont Newhall's *The History of Photography*, first published in 1937 on the occasion of a New York Museum of Modern Art show that surveyed one hundred years of photography, is another canon of the medium's history along with Eder's and Gernsheim's. In the preface of the 1982 revision of Newhall's

<sup>&</sup>lt;sup>2</sup> The Gernsheim history is deeply indebted to the very thorough research of Josef Maria Eder.

work, the author states unequivocally that "No attempt, ..., has been made to explain the scientific theory of the photographic process." With those words Newhall sidestepped the issue of the technical origin of photography all together; instead he began to promote an aesthetic theory based on the general evolution of the pictorial arts since the end of medievalism. Newhall's formalist history arose in the 1930s when photography abandoned pictorialism to claim its unique formal quality. In the early twentieth century the artistic value of photography could only be legitimized if its roots were found to have grown in the same artistic soil that nurtured other arts and especially painting. Thus concurrent with the emergence of photography's artistic elite materialized a history that found its legitimacy in the broader history of art.

A limited biographical sampling of the most illustrious and influential historians of photography confirm two main groups: one is made of technologists, among them Eder and Gernsheim; the other includes the formalists, Newhall and Szarkowsky. These historians chose to consider historical continuity where they could find it. Without further questions, the technologists elected the camera obscura as the core element providing historical continuity; and the formalists adopted for their lineage the perspectival aesthetic the apparatus appeared to obey. Each group was, of course, directed by the individual educational background and experience of its constituents. Joseph Maria Eder, one of the eldest and most respected historians of photography was a chemical engineer and a restless scholar. Although he was well versed in the history of optics, Eder had a particular interest in the chemistry of photography in accordance with his professional expertise. The research of Helmut Gernsheim, conducted in

cooperation with his wife, Alison Gernsheim, straddles both technology and aesthetic but tends toward a formalist art historical approach. Helmut and Alison Gernsheim were erudite art collectors who conducted their scholarship in the 1950s. Beaumont Newhall, who also worked in collaboration with his wife, Nancy, was a curator who became the director of the Eastman Kodak House in Rochester, New York, from 1958 to 1971. Newhall was the first historian of photography to consider exclusively the aesthetic history of the medium. Newhall, a Harvard-educated art historian, set the tone of photographic art history with the 1937 publication of the Museum of Modern Art's "100 Years of Photography" retrospective. John Szarkowsky, one of the most famous defenders of art photography, was the curator of the photography department at the Museum of Modern Art in New York. Guided by his profession, Szarkowsky had a strong leaning toward aesthetic considerations. Technological determinism doesn't hold much currency anymore; virtually all the histories of photography published post-World War II emphasize the (re)discovery of perspective in the Renaissance as the originary moment in the history of photography.

By turning away from the history of technology, the formalists avoided the question of the timing of the invention of photography. Instead they papered over a large gap with a pictorial theory that appeared to belong to the natural evolution of the visual arts. And it took half a century of incessant debate following its invention for photography to be considered *"un art a part entière."* In many ways traditional historians of photography, whether technologist or formalist, have given up trying to fill the gap in the evolutionary theories proper to their discipline. The consideration of this time lapse offers a unique opportunity for an

alternative approach to the history of the invention of photography. A poststructuralist approach to history in particular provides a methodology to explore the space left open by traditionalists.

To cover a 200 years span missing from the history of photography it is necessary to move beyond aesthetic and technological determinisms. By situating the genealogy of the invention of photography within the history of thought this thesis proposes to link the history of the invention of photography to the dramatic changes in epistemic regimes Western culture has experienced from the Renaissance to the nineteenth-century Modernity. In the Baroque period following the Renaissance, painting, drawing, etching, poetry, and literature were modes of expression based on idealized versions of nature and humanity making visual culture and visual representations pure products of the intellect. The result of a radical shift from the technical to the intellectual environment allows the history of photography to transcend the narrow confines of technology and formal appearances. It allows us to place the invention of photography within the movement of democratization and secularization – products of the philosophy of the Enlightenment – that forced the reevaluation of modes of representation based on idealism.

#### Poststructuralist Approaches to History

The research of the poststructuralist historians I have chosen to follow for this study were inspired by the work of Michel Foucault and Gilles Deleuze. An important concept in their vision of history is a historical notion of a two-fold "machine:" one part of which is a set of trends and assumptions guiding a system

of abstract structures that Foucault and Deleuze refer to as the "informal diagram;" the other part is made of the material consequences of the bearing of those abstractions on reality – particular institutions<sup>3</sup> or legal frameworks. More importantly Deleuze tells us that "[t]he machine is social before being technical. Or, rather, there is a human technology which exists before a material technology" (Deleuze 39). Taking a clue from Deleuze, and inspired by Foucault who sees social arrangements as material manifestations of historically situated philosophical problems, I will examine the timing of the invention of photography as the expression of a succession of philosophical problems developing from the Renaissance though the Enlightenment.

The invention of photography came at a crucial moment in the history of western Europe, a moment of transition between the Classical age and Modernity. We will see that the lack of a Classical subject followed by modernity's recovery of the subjective as an object of knowledge are key to understanding the timing of the invention of photography. However, this thesis is not a social history of photography resembling the efforts of new historians like Gisèle Freund or Mary Warner Marien. Despite their merit, Freund and Marien's works were conducted on the surface at the level of the social organization where only the signs of deeper problems appear. Researching multiple layers below the level of social organization (hence the reference to archeology) Michel Foucault and his followers are interested in the mutual interactions of systems of belief and social processes; in particular they are concerned with the processes of objectification of the subject which characterize modernity. For them history is based on the

<sup>3</sup> Punitive or normalizing institutions like prisons or high schools, for instance.

variations of the understanding that humans have of themselves and how this understanding is acted upon in the social realm.

Foucault wasn't interested in writing a social history, he rather considered philosophical discourses to be events in themselves and thus to have a social impact. Archeology was his method to outline a topology of discursive events (Foucault 1984). Therefore my methodology is based on the exploration of the philosophical, scientific, and aesthetic discourse related to vision and visual representation during the period in question. Along the way I will provide technical and aesthetic landmarks which should only be considered to be materializations of the discourse under review, in the socio-political and economic realms.

The French publication by Michel Foucault of *Les Mots et les Choses* in 1966 (translated in English as *The Order of Things* in 1970) instigated a movement to revisit – if not to revise—the general concept of an evolutionary history cascading naturally down a linear path. *The Order of Things* was soon followed by *The Archaeology of Knowledge*. Both publications had a profound impact on the treatment of Western history on both sides of the Atlantic. In this section I will introduce Michel Foucault's methodology before reviewing the efforts of Jonathan Crary and Geoffrey Batchen to offer poststructuralist explorations of the invention of photography.

Rather than identifying certain events or certain arbitrary moments as the natural dividers of history, Foucault makes the condition of human knowledge the condition of history as well. Foucault remarks that human knowledge didn't evolve in an orderly and linear fashion but in a series of intellectual schemes

whose equilibrium were periodically challenged to dramatic effect. Those swift epistemic variations mark a rupture in the passage of one historical period to the next<sup>4</sup>. In *The Order of Things* Foucault identifies and describes four such epochs which he calls epistemes.

Out of the Middle-Ages, and into the Renaissance, emerges a system of knowledge - an episteme-that is based on a system of resemblance that finds its expression in a schema based on distances and attractions between all things. Knowledge consists in recognizing the likeness of certain things to other things. For instance the fact that a walnut looks like a brain puts the walnut in the same order as the brain. Pursuing this logic, eating walnuts will be good for the brain. The unity and ordering of the world is insured by the similarities that join all things in one coherent ensemble. God, the only creator, left his mark on everything. It is His signature that man needs to collect and recognize. But for knowledge to be possible, a discourse that matches its object must first be established, hence the recognition of early languages - language here is understood as its written form-as the mark of the absolute the truth of God. The written language is not a system of signifiers referring to signified but is part of the natural world as a sign of signification in itself. Foucault writes "Language partakes in the world-wide dissemination of similitudes and signatures. It must, therefore, be studied itself as a thing of nature ... Words group syllables together, and syllables letters, because there are virtues placed in individual letters that draw them towards each other or keep them apart, exactly as the marks found in nature also repel or attract each other" (35). For the Scholastic thinkers engaging

<sup>4</sup> Incidentally no historical period is more deserving of attention than another.

in the task of systematic classification is unnecessary because the world has already been arranged by God:

> In the beginning was the Word, and the Word was with God, and the Word was fully God. The Word was with God in the beginning. All things were created by him, and apart from him not one thing was created that has been created. *In him was life*, and the life was the light of mankind. And the light shines on in the darkness, but the darkness has not mastered it. (John 1:1-5)

From a Foucauldian perspective this King James version of the Gospel of John serves as a dependable, and well worn, summary of the motivation driving the Medieval episteme.

God's ordering only needs to be comprehended in the structure of resemblance which equates form with content. Thus the structure of language was defined by its ternary nature: it is a mark, it is content, and it is part of a network of resemblance linked by a common shape. In the scholastic story of the Middle-Age and Renaissance the original transparency of language has been lost as a punishment bestowed upon men by the destruction of Babel – the destruction of Babylon by God. In the sixteenth century the study of nature like that of grammar was dedicated to deciphering the word of God in all things. For the scholastic philosophers knowledge was the operation of reconstituting the logos – the word of God.

At the end of the Renaissance comes the realization that resemblance is somewhat inadequate to explain all the relations between language and things. Foucault gives Cervantes' *Don Quixote* as an example. The delusional visions of the knight who confuses flocks with armies, ladies with domestics and inns with castles are so many discrepancies that illustrate the limitations of scholastic thought. Don Quixote is caught in between a book - a repository of signs-and a reality which he needs to reconcile with each other. But Don Quixote's failure to demonstrate the conformity of signs with reality ultimately empties the words of their content. In the second part of the novel certain characters who have read the first part recognize Don Quixote, the hero. At this point the story folds upon itself and words get invested with the power of representation -- the signified is severed from the signifier, the content detached from the form. From the theory of representation comes a new form of knowledge. In the seventeenth century the sign takes its binary constitution, a signifier pointing to a signified without any other grounding. Language takes on a new transparency, and it is from language itself that a new order begs to be established but not an arrangement based on similarities. Foucault tells us that on the edge of this conception of language stand the madman and the poet in direct opposition of each other. They each resist the normalization of language in their own way: the former by an amalgamation of all signs and resemblances that ultimately erases all differences; the latter by filling words with self-referential abstractions (50). In between lies the field of representation. Words can now designate several things that are different from each other. Thinking is not to find similarities anymore but to determine identities and differences. Comparing generates an order out of the analysis of those identities and differences (54). For the scientist of the seventeenth century the danger resides in letting oneself be fooled by things that resemble each other and finding correlations that do not exist. Hence, systematic rational measurements become a means of abstraction as well as normalization. Measuring allows the

enumeration of the differences that make, or break, a unique identity. Foucault summarizes the general science of order during the seventeenth and eighteenth centuries in the concept of *mathesis universalis*.<sup>5</sup> The *mathesis universalis* can be though of representing a universal language based on mathematics, a system in which all things can be described from elemental and standardized components. The episteme of the Classical age is thus characterized by the necessity of taking measurements as a means to classify while asserting that the condition of being is to belong to an order so that what resists measuring – is irreducible to an algebraic formula—is still defined by an order of things (57). For instance to be classified into families, plants do not need to be individually described in their entirety but abstracted in a series of objective features – shape of leaf, size of stem, etc.—that can be named and laid out for comparison in a general botany table.

From the first part of Michel Foucault's *The Order Of Things* we need to retain a few elements that are most important in the framework of this project. First is the advent of the epistemic break between the Early Renaissance and the Classical age. It is a division that marks the passage of language from being experienced as a mark on things, a stigma, to being an autonomous system that hovers above all things. And it is a break that separates a culture in which God is the only creator, where things take meaning from their resemblance to other things, and where language like everything else is an object of the wisdom of God, from a culture which upholds the autonomy of a language as an interface between knowledge and the natural world. The instigation of this inaugural epistemic break opens the possibility of the existence for more such breaks.

<sup>&</sup>lt;sup>5</sup> A term used by Descartes and Leibniz.

Following the passage from Scholasticism to Classicism, the next break will occur between eighteenth-century Enlightenment and nineteenth-century Modernity. Second, and just as important the urge of the age of the Enlightenment to classify all things, what Foucault calls taxinomia, is meant to provide a representation of what was thought to be the permanent structure of the world. The logic of an immutable universalism was an integral part of the seventeenth- and eighteenthcenturies' episteme.

Finally, we must remember that while humans insinuated themselves as agents of classification, as the observers of the natural world they remained outside the ordering they initiated. While this was the period that created the individual, that individual was an observer but not yet a subject to be observed – not yet an object of psychological and sociological study. Man stood outside the system of representative classification, which is to say outside representation. Foucault reminds us that the discussion of Velasquez's "*Las Meninas*" in the opening pages of *The Order of Things* is intended to demonstrate this very point. In this "mise-en-abîme" of the observer and the observed, one player (whether the painter, the King or the viewer) is always invisible (4). That is at least until the emergence of a new epistemic order:

Before the end of the Eighteenth century man did not exist – anymore than the potency of life, the fecundity of labor, or the historical density of language. He is a quite recent creature which the demiurge of knowledge fabricated with his own hands less than two hundred years ago: but he has grown so quickly that it has been only too easy to imagine that he had been waiting for thousands of years in the darkness for that moment

of illumination in which he would finally be known (Foucault's italics 308).

Thus the invention of a human, that is the objectification of the subject which is the core preoccupation of post-structuralism, is a recent invention whose historicity has been naturalized by the modern epistemic regime. Foucault later insists: "The Classical *episteme* is articulated along lines that do not isolate, in any way, a specific domain proper to man" (309).

In the same way that the medieval episteme collapsed from reaching its own limits, Classical episteme proved unable to accomplish its goal of absolute nominalization. Certain ordering could not, for instance, accommodate marginal cases. Words were relative, their designation sometime uncertain, and they couldn't make all things fit in a fixed system of representation. In addition, the dimensional tables of the Classical episteme had no place for time, a fatal flaw when endless change was the nineteenth century's main characteristic. In the early 1800s sciences began to be separated according to their particular internal logics. New specialized and semi-autonomous disciplines self-defined by the unique coherence of their form of discourse were constituted. Foucault refers to these specialized discourses as "discursive formations." Grammar became philology, natural science biology, and the analysis of wealth economics. Foucault declines to explain the reasons for these transformations but asserts that the traces of their happening are evident. Foucault even ventures to give the dates that framed the process "the outer limits of the years 1775 and 1825" (Foucault 221).

Coincidentally (or not) the later of those dates matches the advent of the earliest

recorded photograph: 1826 is the date attributed to the very first known photograph, Nicéphore Niépce's "View from the Window at Gras."

This thesis explores two fundamental questions: Why wasn't photography invented soon after its major technological components were discovered c. 1650? And why was it invented in the early decades of the nineteenth century c.1830? The answers to both questions was found by situating the genealogy of the invention of photography within the development of the Western philosophy of vision. The fact that photography was invented at the junction of the Classical and Modern epistemic regimes offers a unique opportunity to approach the history of photography from the perspective of the history of thought. Hence this thesis takes its inspiration from the work of Michel Foucault and some of his followers -in particular Gilles Deleuze, Jonathan Crary and Geoffrey Batchen. The result of this radical shift from the technical to the intellectual environment allows the history of photography to transcend the narrow confines of technology and formal appearances. It allows us to view photography as a product of the crisis generated by the discovery of the modern subject. Ultimately photography would prove an invaluable instrument in the project of modernity to transform the (knowing) subject into an object of knowledge.

#### Techniques of the Observer: Contributions and Limitations

I will begin my inquiry by reviewing the work of Jonathan Crary. Building on Michel Foucault's detailing of the break between the Classical and Modern periods Crary elaborates the making of a new observer from a supposedly fresh discourse of vision and visuality that emerges in the early 1800s. But before

stepping into a dissection of the modern episteme, Crary sets the premises that link the previous incarnation of the observer to the awareness and uses of the camera obscura during the seventeenth and eighteenth centuries. In *Techniques of* the Observer Crary proposes an alternative to the traditional story of the ascendancy of modern vision. Crary contests the narrative that assigns responsibility for the dissolution of perspectival representation, in use since the early Renaissance, to the renewal of realism supported by the invention of photography. Crary does not see the trend that moves painting towards abstraction as a reaction against the realism of photography but as a contradiction that can only be resolved by abandoning evolutionary models of representation that pit abstraction against realism. Unlike traditional art historians, Crary doesn't believe that the emergence of a modern visual order, in the nineteenth century, completely did away with realist representation. For Crary the vision that began to be expressed by the impressionists with Manet followed by post-impressionists like Cezanne was actually a peripheral movement to the realist core that was taking hold in modern society and continued to be developed throughout the 20<sup>th</sup> century with the diffusion of photography, cinema and television.

In other words, for Crary, a history of modern vision is not entirely dependent on changes in representational practices but instead should be linked to the changing definition and role of the observer. Crary finds a new nexus for the articulation of nineteenth-century visuality in a self-observing subject created by the episteme of modernity. Crary positions the observer/subject at the center of the notions of vision and visuality. The observer is the place where vision occurs and where a historically situated visuality can be interpreted.

Unlike the consuming spectator, the observer takes an active role in making and complying with certain rules of perception that permeates any historical period's general ethics. Those rules of conduct are difficult to detect because they are diffused through dominant discourses, technologies and institutions. But Crary's observer is not a stereotypical person; s/he is more of an hypothetical being or even an imaginary place. Crary's observer stands for the synthesis of a range of possibilities that didn't exist prior to the period under consideration. It would be a mistake to see the Classical or Modern observer represented by a given individual - a position prized by traditional art history and phenomenologyit is rather a set of rules that are imposed by social forces that act upon a common "social surface" (6). Thus Crary's objective in describing the nineteenth century observer is to reassemble in one place the disparate elements that ruled the century's concepts of vision and visuality. Most importantly Crary intends to demonstrate that the radical break between Classicism and Modernism can be traced from the emergence of a new observer. Crary is well aware of the artificiality of defining historical breaks which only exist in the telling of history but not in the unfolding of history itself. The determination of such breaks Crary says is a political choice designed to promote a certain "construction of the present" (7). Nevertheless all texts have a beginning, a middle and an end; Crary simply advises us not to confuse the beginning and end of the story with those of a history always liable to reinterpretation.

As a disciplined Foucauldian, Crary stays attached to the corporeality of the systems of power that cross the social field of daily existence(s). Crary chooses to materialize those dynamic and changing relations of power in the changing, or

emerging, functions of certain optical instruments in particular the camera obscura and the stereoscope. As we will see later, these contraptions do for Crary what Jeremy Bentham's Panopticon had done for Michel Foucault. Evidently those devices are embedded in a larger social current that produces the scientific, philosophical, aesthetic and even commercial discourses that provide the evidence of a changing world. It is by turning to the dynamics of social relations and philosophy rather than a technical teleology that Crary intends to go against the traditional history of (imaging) technology. Thus in Crary's words, "[a] history of the observer is not reducible to changing technical and mechanical practices any more than to the changing forms or artwork and visual representation" (8).

Instead Crary finds the evidence of a changed society in the nineteenth century's "radical abstraction and reconstruction of optical experiences, thus demanding a reconsideration of what 'realism' means in the nineteenth century" (9) Crary's method is to unveil how the nineteenth century retrieved the subjective vision that had been suppressed by the seventeenth- and eighteenthcenturies epistemic order. For Crary, the traces of the resurgence of subjective vision is not limited to the discourse of Romantic poets but pervades the scientific and philosophical discourses of the time, which integrate science and art as part of a common episteme. Crary doesn't recognize a definition of modernity that is attached to a particular notion of economic development or political transformation but sees instead a broader epistemic reorganization that encompasses objective and subjective conditions. Out of this restructuring comes the need to cope with the most obvious manifestations of modernity: the development of urban spaces, the dislocation of time and space owed to the

development of rail travel, telegraphy, and the assault of new forms of information. Those innovations are accompanied by a less spectacular but just as drastic redefinition of the observing subject. In this remapping of values, photographs have become a currency in a new system of cultural exchange that encourages a new social hierarchy. Images impose themselves as a form of the real which like money substitutes a symbolic system for an actual set of relationships – although we will see that the commoditization of photography carries a special function in the relation of nature to culture in that it folds one into the other. The photograph as commodity is an epistemic device that turns nature into a subject and culture into an object.

Crary recalls that art history is also an invention of the nineteenth century. Its purpose along with the wide diffusion of selected artistic production is to help sanitize the minds of a growing middle-class population. Art historians of the nineteenth century refused to deal with contemporary art toward which they were rather contemptuous. Crary assigns the early art historians' disdain for contemporary artists to the recognition, conscious or unconscious, of an inassimilable rupture in the field of visual iconography. When finally nineteenthcentury art was documented by twentieth-century scholars, it was in the critical terms of much earlier forms of painting. Thus, Crary asserts, the visual particularities of academic painting produced in the early to mid-nineteenth century has been lost to comprehension. It now needs to be retrieved for it specifically addressed the newly constituted observer – an observer who, at that moment, is immersed in an unstable relationship to visual perception which is neither fixed in an outside, nor internally predictable.

Chapter Two of Techniques of the Observer, "The Camera Obscura and its Subject," is dedicated to asserting the seventeenth- and eighteenth-centuries' norms of understanding and usage of the camera obscura. Those are the norms that Crary insists were eventually broken by nineteenth-century practices and discourse(s). As I mentioned earlier, while the camera obscura appeared in the Renaissance, the principles of its functioning had been known since the Antiquity. Crary's, like every other history of vision or photography, doesn't fail to mention Aristotle, Alhazen, Leonardo Da Vinci, Porta, and Kepler as the key characters of the camera obscura narrative. From the late sixteenth century to the late eighteenth century the camera obscura, Crary tells us, was perceived at once as a model for human vision, as a "philosophical metaphor" and as a scientific apparatus. It was used in a variety of practices from teaching to entertainment. Crary notes that despite this variety of uses during a very long period of time – over 200 years—the discourse surrounding the camera obscura, its "discursive identity" (30), is remarkably consistent. And this identity revolves around the dual nature of the camera obscura as a machine and as an object of discourse. Crary cites Gilles Deleuze's notion of assemblage, according to which the camera obscura would be "simultaneously and inseparably a machinistic assemblage and an assemblage of enunciation" (cited in Crary 31). The status of camera obscura compels Crary to extract the instrument from the technical lineage of photography and instead understand it primarily in its social usage and intellectual context. In the social environment, Crary argues, the statements enunciated relative to the camera obscura change radically between the 1700s and the 1800s. This abrupt change signifies a rupture between the camera obscura and the still camera. For

Crary, before the nineteenth century the camera was an autonomous system of representation that modeled human vision and by extension the relationship of the observer to the natural world. As such, many early descriptions of the camera obscura marveled at its rendering of moving objects. This discourse could have been prefiguring cinema as well as still photography. Crary, however, doesn't separate each technology arguing instead that, in the Classical age, temporality can be "seen and experienced, but never represented" (34).

At this stage of his argument, Crary takes a detour to deny the possibility of regional differences in the perception and uses of the camera obscura. In particular Crary takes Svetlana Alpers to task for offering a notion of continuity in visual representation from the Renaissance through early nineteenth-century photography via the style of Northern European painting also known as "Dutch painting." While Crary faults Alpers for providing a northern path to visual and technical continuity from painting to photography, the original history of photography that took aesthetics for its guide, Beaumont Newhall's *The History of Photography*, chose the southern route through the Italian Renaissance (re)discovery of perspective drawing that was formulated by the Florentine architect Leon Battista Alberti. Ultimately Crary's and Alpers' divergence of opinion sounds like a quarrel between aestheticians; however it is a move on Crary's part to begin to legitimize his interpretation of the two Vermeer paintings he later uses as examples in his argument on the position of the observer relative to the outside world.

From Crary's grasp of the camera obscura as a metaphor for the Classical observer, we understand that the latter, like the King of Spain in Velasquez's "Las

*Meninas*," remained outside the realm of representation. But, more importantly, Crary claims that the invisibility of the observer and his or her isolation from the world being observed was due to the observer position inside the apparatus, whether physically or figuratively. Enlightenment thinkers understood vision to be an internal process. Vision was the intellectual process of interpretation of the images of the mind rather than the cognitive process of sight. For Crary, the camera obscura from the Renaissance to the end of the eighteenth century was a metaphor for vision for its symbolization of the separation of the observer from the outside world. To support his argument, Crary provides a string of evidence including quotes from Locke and Leibniz, paintings by Vermeer and Jean-Baptiste Chardin, and a particular experiment by Descartes which I will also discuss.

Crary's concept of the Classical observer is best summarized by his commentary on two paintings by Vermeer, *The Astronomer* and *The Geographer*. Each of Vermeer's pictures depicts a pensive scholar in surroundings appropriate to their professional endeavor. The astronomer is shown with his hand resting on a globe and the geographer hovers above a large sheet of paper while holding a compass in his right hand and clutching what appears to be a book in the other. Each stands by the lone window illuminating what appears to be a rather shadowy and cavernous space (44, 45). Crary interprets those paintings as representations of scientists exploring their inner thoughts rather than engaging in the observation of the world at large. Vermeer's images are depictions of the mind from the inside and symbols of self-absorbed thinkers isolated from the physical manifestations of nature. The size of the rooms exceeds the frame of the painting on all sides

suggesting an infinite volume meant to be an abstraction for the space of the mind. Each of the spacious but somber rooms is lit by a single large opening. Both rooms are identical except for some pictures hanging on the walls, which are, as we will see, reminiscent of Locke's conception of ideas. The different shapes of the window in each painting can be taken for the sensory apparatus proper to each observer. The props garnishing the sparse rooms offer a faint hint of individuality. The folds of the heavy fabric wrapping the men's worktable in each painting is evocative of the folds of brain tissue. On the floor, behind the geographer lies some discarded or forgotten papers that could be old memories. The character's gaze is not completely averted from the windows, as Crary claims; and it appears that the men share their sensorial experience between sight and touch. Vermeer's work puts us physically, as well as metaphorically, inside the minds of his characters. For Crary Vermeer's The Astronomer and The Geographer are an expression of the isolation of the internal vision of the mind from the external reality. The dark chamber in Vermeer's depiction may indeed be a metaphor for the cogitation of the mind; it is, however, a metaphor that takes some liberty with the functionality of the camera obscura. For instance, all the descriptions of the camera obscura since the antiquity insist on the small size of the opening through which the light enters to form an image on the opposite wall of the dark chamber. The large windows from which light pours on the thinkers inside do not seem appropriate to symbolize the optical specifications of a camera. In addition, the images forming inside the camera obscura are consistently praised for their formal beauty rather than their meaning. And finally the camera obscura was not considered by natural philosophers as a scientific instrument but as a curiosity and

an artist's tool. These formal discrepancies between the optics and functions of the camera obscura and Vermeer's paintings weaken Crary's interpretation of *The Astronomer* and of *The Geographer*.

To complete his demonstration Crary dedicates the second part of The *Techniques of the Observer* to the period on the other side of the epistemic divide. The nineteenth century ushered the episteme of modernity and with it came the recovery of the previous period's missing subject. To introduce his readers to modernity's own account of the realm of vision, Crary uses Goethe's research into perception and the occurrence of afterimage. In his Theory of Colors Goethe described optical phenomena which manifest themselves with or without the help of a camera obscura. Self-generated images are induced by direct pressure on the eyeball or from physiological event such as the persistence of the image of a light spot seen against a dark background after one's eyes are closed or illumination is turned off. Other events include the apparition of a spot of complimentary color after an area of primary color has been removed for the optical field; and the mixing of small spot of various colors grouped close together into a single composite color - the effect dear to pointillist painters. Thus, Crary says, with subjective vision materializes a physiological object of study and an "autonomous producer of his or her own visual experience" (69). The eye becomes a questionable sensorial apparatus and by extension an unreliable, if specific, source of knowledge. Crary here assumes that, in contrast to the modern subject, the Classical observer trusted the accuracy of visual information, but Descartes' radical skepticism, for instance, seem to disprove this assumption. We will see that the philosophers and scientists of the Enlightenment were, in fact, generally

suspicious of the information provided by the senses. According to Crary, the onset of Modernity is the time when vision moves from the stable enclosure of the camera obscura to human's variable corporeality. Crary concludes that Modernity reconnected the disembodied vision system of the Classical episteme to a volatile human physiology. And at the nexus of this connection forms a mix of the observer's subjective assessment with the objective information received from the outside world. Crary suggests that the encounter of the subjective and objective erased the separation formerly symbolized by the metaphor of the camera obscura. Hence the partition between the observer and the observed was dissolved as they became interchangeable and representation was overtaken by sensation. While anticipating the definition of the modern observer, Schopenhauer, recalls Crary, makes physiology the agent of the production of colored vision. It is Schopenhauer's quest for an autonomous aesthetic subject rooted in a quasi-Foucauldian obsession with corporeality that provides Crary with a dependable definition of the modern subject: a subject whose autonomy resides in his own objectification.

With the objectification of the subject, modernity transformed the natural sciences into the discipline of physiology which undertook the functional segmentation of the body and in particular the separation of the senses from each other and from motor functions. Following this fragmentation, sight was promoted from a privileged to a truly unique sensorial apparatus<sup>6</sup> (Crary 79-83). Citing Mueller, Crary repeatedly emphasizes the importance granted to the

<sup>&</sup>lt;sup>6</sup> It also appears that the separation of motor and perceptual functions, and their subsequent assignment to a hierarchy was created in the service of a new social order that will itself become part of the modern episteme.
autonomously generated visual sensations which render the camera obscura superfluous. In consequence, "[v]ision is redefined as a capacity for being affected by sensations that have no necessary link to a referent, thus imperiling any coherent system of meaning" (91). Crary's remark indicates that early in the nineteenth century the episteme may have been teetering on the brink of annihilation for lack of a solid ground. Crary reminds us of the various attempts by scientists of the time<sup>7</sup> to devise quantification schemes in order to secure the objective bottom line (101-102).

Crary maintains that because they belong to separate epistemic regimes which had different conceptions of the observer, the camera obscura and the still camera belong to different genealogies as well. To make his point Crary takes the discourse surrounding the camera obscura as so many metaphors of the position of the observer relative to the exterior and interior worlds. The pictures forming in the Classical observer's camera obscura are, like the pictures forming in his head, isolated from the reality they represent *a contrario* to photographs which are thought to retain a direct connection to reality. The observer of the seventeenth and eighteenth centuries, Crary tells us, stays isolated from the world he observed while at a later time the modern observer, either from self-reflectivity or as an object of inquiry himself, became integrated into the system of representation. Crary's positioning of the observer, including his relationship to the camera, disrupts the assumed historical continuity of the episteme of vision. Out of Crary's demonstration we can deduce that the camera should be considered to be an epistemic device that morphs in response to the intellectual environment proper

<sup>&</sup>lt;sup>7</sup> Hermann von Helmholtz, Gustav Fechner, Ernst Weber, Wilhem Wundt

to the period. Crary's field of investigation is indeed the abstract side of the social machine Foucault and Deleuze proposed. By making the observing subject the pivot on which an epochal change is articulated, Crary can sever social transformation from technological progress or, rather, subordinate the technical to the social.

Crary's *The Techniques of the Observer* does not provide an answer to the question of the timing of the invention of photography but it gets us part way there. If we transpose Crary's argument to the historical domain of photography, we can see that it denies the possibility of historical continuity based on technological determinism. And ultimately it is an argument against a futile search for origin, an aim which satisfies the conditions of poststructuralist conceptions of history. The most beneficial effect of Crary's argument is to allow us to carry the discussion of the invention of photography from the technological and aesthetic discourse into the domain of epistemology and philosophy.

#### Mind Over Matter: The Inward Gaze of the Enlightenment

The location of the invention of photography at the articulation of the Classical and Modern epistemes prompts us to investigate its timing by scrutinizing the epistemic regimes that framed it, and the dynamics of the transition between those regimes. I will argue that aside from being dependent on scientific developments, the discovery of photography is the result of radical changes in episteme and was one of the strategies devised for coping with those changes. But, while the mechanical potential for photography already exist in the seventeenth century, there is not yet a social need, or more to the point of this thesis, a philosophical conception.

The rise of the subject, which began in the late 1700s, started to undermine the very foundation of knowledge. Spiritualism, necromancy, and their manifestations so fashionable at the time were both a cause and an effect of what Foucault referred to as the emerging consciousness of the finitude of man. The rational discourse that strained to explain apparitions as hallucinations had the paradoxical effects to "supernaturalize the mind itself" (Castle 161), with the consequence to bring to consciousness the compromised lucidity of everyone's thoughts. The only way to interrupt a blooming epistemic panic was to devise strategies and techniques of stabilization. The desire to photograph, to borrow Geoffrey Batchen's terminology, became a necessity brought on by the imperative to isolate the whole of knowledge from the vagaries of "human nature" where the thinking of the Enlightenment had anchored the episteme, and to consolidate the foundations of knowledge on the stable bedrock of an unchanging nature. A nature, which in turn will be prodded into a dialog with culture mediated by photography. For its adaptability to the collective as well as to the individual photography, the referent without a sign (Barthes 6), will provide the ideal stage where to act out the ongoing negotiation between nature and human nature, the objective and the subjective.

At this point the question which started my enquiry still lingers. But in the light of Crary's exposé (and despite some of its flaws) we have learned that we should split the original question in two: one addressing the period before and a one for the period after the invention of photography. Instead of asking why

photography wasn't discovered before 1839 we could ask: "What, if anything, made photography unnecessary or even undesirable before the inauguration of the nineteenth century; and what made it desirable, even necessary, after that?"

To begin to answer those questions we need to review, and correct, some of the evidence advanced by Jonathan Crary. The objective of this thesis is not to conduct a criticism of Crary's work but to further explore the metaphor(s) for which the camera obscura is a vehicle. *The Techniques of the Observer* is not a document about the history of photography and the problem I am trying to solve does not figure among Crary's major preoccupations, though it figures at least implicit in his choice of object. It is only within the specific framework of my particular inquiry that I feel compelled to "revise" some of Crary's assertions.

I do not want to fault Jonathan Crary for confusing simile and metaphor as this is not the case. But as Sarah Kofman indicates in *Camera Obscura of Ideology* metaphors using the camera obscura as their source domain are plentiful and in themselves offer a manner of continuity across several centuries. In the conclusion of her book Kofman implies a certain continuity in the role of the camera obscura as an epistemic device from the seventeenth to the nineteenth centuries:

> And so we turn to Descartes who shows us that the use made of the camera obscura metaphor in the nineteenth century –as an image of the unconscious, of inversion, of perspectivism– is not a necessary consequence of the model itself. A metaphor such as this resists the evolution of science. That is it operates above all through its mythical significations, and through its impact on the unconscious. (53)

Kofman points to the fact that there are two distinct "visions" of the camera obscura: one is a simile and the other as a metaphor. The simile is the model of the eye resembling the camera obscura: the camera obscura is like the eye; it is the instrument of sight. The metaphor, as we have been told, is that of vision. In general the thinkers of the Enlightenment period do not differentiate between vision and mind; but they do separate sight, and the senses in general, from vision. To accomplish his objective of isolating the observer within the camera obscura, Crary had to put the emphasis on the metaphor of the mind to the detriment of the model of the eye as such. He then had to push the entire construction to assimilate the camera obscura to the mind with the intention of demonstrating a change in the character of the apparatus in concert with the transformation of the episteme.

When Descartes experimented with placing a human, or a bovine, eye instead of a lens in the opening of a camera his intention was to demonstrate the optics of the eye, not to build a model of the mind. The mind interprets sensorial information from various provenance; the eye is one of the sensorial purveyors but is not necessarily superior to the other senses which are complementary of each other. Descartes explained his experiment this way:

> Thus you can clearly see that in order to perceive, the mind need not contemplate any images resembling the things that it senses. But this makes it no less true that the objects we look at do imprint very perfect images on the back of our eyes. (Descartes cited in Kofman 51)

Descartes reasserts the autonomy of the images of the mind from those forming in the eye; but they may or may not resemble each other. The "disembodied" eye is most of all "disem*mind*ed" (Atherton 146). Descartes's experimentation expresses

the interchangeability of the unthinking eye with the human one strictly in terms of the mechanics of perception. Vision, on the other hand, requires a brain to order the sensorial information dispatched by the senses. Thus vision within the mind may be immaterial but it is deeply embodied, for it needs to be connected to multiple bodily sensors. While the camera obscura is a model of the eye and only parenthetically, at least in that period, a metaphor for the mind, Crary chooses to emphasize the metaphorical interpretation of the apparatus. After recounting Descartes's substitution of a real eye for the camera lens Crary writes:

> By this radical disjunction of eye from observer and its installation in this formal apparatus of objective representation, the dead, perhaps even bovine eye undergoes a kind of apotheosis and rises to an incorporeal status. If at the core of Descartes's method was the need to escape the uncertainties of mere human vision and the confusion of the senses, the camera obscura is congruent with this quest to find human knowledge on a purely objective view of the world. (48)

Crary suggests that Descartes holds a definition of objectivity autonomous from the mind of the observer. For Descartes an objective (or rather rational, since whether in science or journalism, objectivity is a notion that doesn't appear until the nineteenth century) image needs to be calculated, something the camera obscura is unable to accomplish by itself – the camera obscura can only calculate the projection of the three dimensional world onto the two dimensions of flat representation. Descartes considered the picture in the camera obscura like the one in the eye to be potentially deceptive. Descartes used to complain that perspective such as that produced by the images of the camera obscura distorted reality (Atherton 147). Lyles Massey reminds us that:

Twentieth-century treatments of linear perspective generally assume that the viewpoint stands paradigmatically for Descartes's rational subject. And yet Descartes himself would have rejected this comparison because the graphic point is corporeal and spatial, and thus cannot represent the mind's transcendent grasp of the world's infinite extension. For Descartes, perspective reveals the inherent distortion of vision itself, and thus represents exactly what the rational mind must overcome. (Massey)

Thus even for Descartes, images in the camera obscura are far removed in their constitution and veracity from the images of the mind. The metaphor camera/mind may work but to a point that falls short of allowing us to project the epistemic construction of the seventeenth-century observer back onto the camera obscura.

We find a better match for Crary's metaphor in Locke's *Essay Concerning Humane Understanding* (1690), which Crary also cites. Although, like most philosophers of his time, he was an advocate of the *mathesis* in his quality of empiricist, Locke was not as reliant on the abstractions of mathematics and geometry as Descartes was; thus his conception of pictures of the mind may better fit the metaphor of the camera obscura. This is how Locke expressed his belief:

> External and internal sensations are the only passages that I can find of knowledge to the understanding. Those alone as far as I can discover are the windows by which light is let into the dark room. For, methinks, understanding is not much unlike a closet wholly shut from light, with only some little opening left ... to let in external visible resemblances, or some idea of things without; would the pictures coming in such a dark room but stay there and lie so orderly as to be found upon occasion it would

very much resemble the understanding of a man. (Locke qtd. in Crary 42)

Here too we encounter an articulation of the separation of the external and internal worlds. But Locke, an empiricist, only ascertains that the senses are the exclusive instruments of cognitive apprehension. As such they provide a path to knowledge but are not the essence of human understanding. Neither the philosophy nor the science of the time took sight as an isolated mode of perception however privileged seeing might have been considered to be. Even Crary reminds us that from Descartes to Diderot touch was often considered superior to sight (59). The question raised by the Molyneux experiment,<sup>8</sup> popular until the late nineteenth century, is an example of the discourse demoting sight to the benefit of touch. More importantly in this extract from the *Essay Concerning Humane* 

*Understanding* Locke expresses the wish to be able to fix the pictures of the mind for later retrieval from a permanent and orderly archive. With the articulation of this longing Locke is as close as anyone to describe the function of photography –yet neither he nor any of his contemporaries ever suggested to use the camera obscura for such a function.

In *Essay Concerning Human Understanding* Locke uses the word "picture" over thirty times to refer to either ideas or memories which indeed, like the pictures of the camera obscura, are fleeting and temporal. The metaphor, however, may stop there. More importantly, in an other remarkable passage of his essay Locke advanced the concept of negative and positive images:

<sup>&</sup>lt;sup>8</sup> The Molyneux problem asks whether or not a man blind from birth who can recognize the shape of object by touch would be able to distinguish between a sphere and a cube if he was suddenly made to see.

[w]hether the shadow of a Man, though it consists of nothing but the absence of Light (and the more the absence of Light is, the more discernible is the shadow) does not, when a Man looks on it, cause as clear and positive an *Idea* in his mind, as a Man himself, though covered over with clear Sunshine? And the picture of a shadow, is a positive thing. (Locke 34)

The negative image of the shadow of a man in the physical world produces a positive image of a man in the mind of the observer. Unlike Descartes's strictly geometrical process of vision, Locke's depiction is that of a binary relationship similar to the structure of language. The shadow, a signifier, points to a sunlit man, the signified. The inside world reconstructs the outside world from the generic perceptual clue that is the featureless shadow. Thus the pictures that stand for the twin concepts of idea and memory are not just images or representations; they are elemental fragments of knowledge.

In the early eighteenth century, George Berkeley put forward a more comprehensive theory of vision that was openly inspired by the linguistic binary signifier/signified<sup>9</sup>. Berkeley's reflections on the nature of vision was an answer to the geometric conception Descartes had exposed in *La Dioptrique* decades before. Thus Margaret Atherton chides Crary for "papering over" Berkeley's *New Theory of Vision* and *Theory of Vision Vindicated*; those works, she charges, were meant to replace Descartes's own theory of vision rather than to endorse or complement it. Berkeley re-centered vision as an exclusively optical phenomenon by insisting on the physiological properties unique to each sense. Going much

<sup>&</sup>lt;sup>9</sup> The trinary structure of language signifier/signified/referent was Saussure's formulation. Enlightenment and Classic philosophers didn't consider the value of the referent. All referents had to be reducible to the universal signifier that populated the ordering tables.

further than Locke Berkeley conforms vision to "a language, in which visual cues serve as signs for meaning that, like the meaning our words stand for, do not resemble the cues themselves" (Atherton 149). Berkeley's idealism did not deny the physical nature of sight or Descartes's elaboration of the rules governing optical geometry. He was only concerned with the vision of the mind or soul. Berkeley's work was about the interpretation of the special character of visual information like dimensions, distance and position. Thus Crary misinterprets Berkeley when he affirms that the natural philosopher dismissed depth perception as an artificial visual effect (Crary 62, Atherton 150). Berkeley found Descartes's weakness in the latter's interpretation of the relationship between the mind and the inverted image forming in the eye. Descartes believed that the brain retraced reality from the inverted image formed on the retina by an innate process of mental geometry. Berkeley thought that retinal information was interpreted like a language. For instance, an observer knew that something small and faint was far away by deduction from a set of learned conventions rather than by calculating distance from the angle between the point of view and the object. Berkeley devised a theory based on separating a perceptual object –what, today, we would call a signifier- from a corresponding "mediate" object, our signified -that is a product of the imagination. For Berkeley this principle necessitated the division of the senses into separate pathways where sight is dedicated to color shapes and brightness, hearing to sound, touch to sensing temperature and other tactile properties, and so on. Each sense offered its own array of conventions (Atherton 149-151).

Berkeley's philosophy shows that many of the physiological discoveries attributed to the nineteenth century had already been initiated in the early eighteenth century. The recognition of an early theory of vision based of the separation of the senses does not by itself invalidate the idea of an epistemic break between Classical and Modern thoughts. To identify vision with a language, or to have to learn to interpret sensorial information as so many languages didn't bring the subject any closer to the circle of self-representation. The subject's invisibility continued to be at the core of the Classical episteme despite the early notion of the subjective interpretation of perceptual information; this notion was of an essentially cognitive nature. The Classical subject was still more individual than subjective being. The characteristics of the modern subject were created by the discourse and practices leading to its own objectification.

# Classical Ideology of the Invisible Subject

Foucault seized on Velasquez's *Las Meninas* with its symbolic exclusion of the subject and the observer as an allegorical representation of the Classical episteme. Both observer and subject stand at the outside edge of representation; but if the status of the subject was uncertain the presence of the observer was indispensable. The famous riddle used to demonstrate Berkeley's logic, "If a tree falls in the forest and no one is present to hear it, does it make a sound?"<sup>10</sup>, summarizes the difference between the observer and the subject in Classical thought. Berkeley's answer to this question would be that it doesn't because the

<sup>&</sup>lt;sup>10</sup> This question, often attributed to Berkeley himself, is in fact a modern formulation designed to illustrate the philosopher's belief.

ear and the mind both have to be co-present with the event to make the sound a reality. For its inherent demand on present and attentive mind and body, this hypothetical question and its answer were an expression of the period's empiricism; it was not an ancient reflection on an objective/subjective duet. On the contrary, for the enlightened observer to exist, the subject as we know it today had to be continuously erased by the rational mind, or he may have heard sound where there was no tree falling and seen images where there was total darkness. The observer and the subject, or rather the soul, who are then separate entities will later be integrated by the secularism of modernity in what Foucault calls the empirico-transcendental doublet (Foucault 1973 318). In the meantime Foucault reminds us that:

If nature is interwoven with human nature, it is by the mechanisms of knowledge and its functioning; or rather, in the general arrangement of the Classical *episteme*, nature, human nature, and their relations, are definite and predictable functional moments. (Foucault 1973, 310).

This may be an idea that Crary took close to the letter. If such is the case, Crary misconstrued the relationship between nature and human nature by regarding the camera obscura as the objectification of "the mechanism of knowledge and its functioning" rather than just a model of the eye. And this despite Foucault's warning that "man ... [h]as no place in it", that is no place as an object of knowledge.

Crary accurately emphasizes the division of the vision of a hypothetical (Classical) observer between the image of the mind – interior – and that of the eye – exterior. But his assimilation of the camera obscura to the genius of the mind is

entirely contestable. However, it is Crary's reasoning along with our critique of that rationale that allows us to jettison the weight of technological and aesthetic determinisms from the history of photography. The timing of the invention of photography must be completely divorced from the idolatry of the apparatus. It should be granted that the invention of the camera obscura in the Renaissance was not the impetus for the invention of photography in the nineteenth century; more than three hundred years went by between these two periods and no discussion appeared to foreshadow the invention of photography until the last decade of the eighteenth century.

Any notion that the invention of the camera obscura marks the origin of photography has to be seen with suspicion. It is a modern historical construction which responds to the demand of contemporary social, and field, imperatives. Such imperatives include the maintenance of the ideology of technological progress and the race for historical origins denounced by Foucault. Among the pressures bearing on the specific field of the history of photography figure the translation of the general theory of evolution to art history and technology. Additional pressure comes from the high valuation of positive knowledge anchored in the identification of origins, in accordance with lingering scientific principles established in the nineteenth century.

Regardless of the interpretation of history, the images of the mind are immaterial; they cannot be retained in a solid state. The visible images that materialize in the camera obscura, akin to the images passing through the eye to form on the retina, are less than perfect distortions of reality. In the episteme of the seventeenth and eighteenth century there was no point in capturing and fixing

the images formed by the eye, or by the camera, since those are just misrepresentations of an unorganized, un-tabulated natural world. Reproductions of nature in its totality could even be burdensome and counterproductive since the task of men of knowledge is to fragment this totality into series of "differences and identities" (Foucault 310) while doing the utmost for their observations to remain untainted by the fooleries of nature. In this episteme preserving pictures of a physical world unmediated by the vision of the mind serves no purpose. Interpreting the world from an archive of pictures from the camera could even lead to unrecoverable misinterpretations - since sight was prone to more distortions than touch, for instance, and should be complemented by correlating sensorial inputs whenever possible. The images of the camera obscura are that much more misleading because they are monocular and two dimensional; therefore they were representations which did not hold enough information to indicate depth or distance, which the mind needed to form an accurate vision. Only from Berkeley's linguistic paradigm could have been conceived a means and a reason to convert vision into permanent images.<sup>11</sup> But for Berkeley vision was a capacity of the human sensorial apparatus, a soulless mechanical apparatus couldn't see; and thus the images of the camera obscura would have been immaterial as well. Nor could an exact copy of nature be made independently from a human observer. But the forest didn't disappear when the observer turned his back. Berkeley resolved this conundrum by associating the materiality of all things to the gaze of an omnipresent God.

<sup>11</sup> This could be applied to sound too.

In the episteme of the age of reason the rational psyche is not yet the psychological subject of the nineteenth century. The mind is not a physical object of study but a spiritual entity. In the seventeenth and eighteenth centuries mind and vision are the embodiment of thought and ideas; and to some degree they all belong to the same immaterial realm. For thinkers of the Enlightenment vision is to the mind what ideas are to thought. And in this relationship vision is not the privileged product of sight but a learned interpretation of a combination of sensorial inputs which, if taken in isolation, have the potential to deceive. This was a notion Descartes was adamant to defend:

> Mais, afin que vous ne puissiez aucunement douter que la vision ne se fasse ainsi que je l'ai expliquée, je vous veux faire encore ici considérer les raisons pourquoi il arrive quelquefois qu'elle nous trompe. *Premièrement, à cause que c'est l'âme qui voit, et non pas l'œil*, et qu'elle ne voit immédiatement que par l'entremise du cerveau, de là vient que les frénétiques, et ceux qui dorment, voient souvent, ou pensent voir, divers objets qui ne sont point pour cela devant leurs yeux ... (Descartes 141 my emphasis)

> But in order that you would not doubt that vision happens as I explained it, I want to still consider the reasons why sometimes it fools us. *First of all, because it is the soul which sees, and not the eye,* and that it only sees with the intersession of the brain, from this comes that hysterics, and those who sleep, often see, or think they see, various things which are not in front of their eyes. (my translation)

Descartes situates the soul in the brain, in effect defining a material cradle for the immaterial spirit. Descartes' concept was taken as the first step toward a secularization of the soul.

George Berkeley agreed with Descartes that "prejudices and errors of sense do from all parts discover themselves to our view, and," he added, "endeavouring to correct these by reason, we are insensibly drawn into uncouth paradoxes, difficulties, and inconsistencies," (Berkeley Introduction §1). But Berkeley also understood that Descartes was beginning to push the soul on a slippery slope. In response Berkeley attempted to defend the spirit of God by arguing for the immateriality of things. However for Berkeley even more than for Descartes it was the mind that separated the "qualities of things," their color, shape or smell and not the senses:

> It is agreed on all hands that the qualities or modes of things do never really exist each of them apart by itself, and separated from all others, but are mixed, as it were, and blended together, several in the same object. But, we are told, the mind being able to consider each quality singly, or abstracted from those other qualities with which it is united, does by that means frame to itself abstract ideas. For example, there is perceived by sight an object extended, coloured, and moved: this mixed or compound idea the mind resolving into its simple, constituent parts, and viewing each by itself, exclusive of the rest, does frame the abstract ideas of extension, colour, and motion. Not that it is possible for colour or motion to exist without extension; but only that the mind can frame to itself by abstraction the idea of colour exclusive of extension, and of motion exclusive of both colour and extension. (Berkeley Introduction §7)

For Berkeley the senses perceive objects in their totality; it is the mind which attributes their qualities (color, weight, motion, etc.) to objects, qualities which remain abstractions of the mind. It is with this bit of circular thinking that

Berkeley creates a system in which the senses as a whole and the mind collaborate in the construction of an immaterial world nested in the soul.

Regardless of their preferences for empiricism, rationalism, or theology for the thinkers of the seventeenth and eighteenth centuries vision takes place in the immortal and indivisible soul hosted by the body. For their immateriality the images cannot be fixed mechanically but require the divine inspiration channeled by artistic expression.

# 17<sup>th</sup> and 18<sup>th</sup> Centuries Painting and the Truth of Nature

For an illustration of seventeenth- and eighteenth-century conceptions of vision, we can turn to portraiture. The painterly portraits depicting aristocrats and rich bourgeois alike were meant to display the internal beauty and the wealth of the sitter rather than their actual physical appearance – although physical beauty and the beauty of soul and spirit were linked since their relationship had been inscribed in the *Physiognomonics*, mistakenly attributed to Aristotle, in the third century B.C. (Berland 252). The link between physiognomy and character continued to be extolled throughout the centuries. To name but a few of its most famous proponents: in the sixteenth century was Della Porta, of the camera obscura fame; in the seventeenth century we find Charles Le Brun; and in the eighteenth century was Gaspard Lavater (Berland) For the artist wrestling with likeness meant being able to let his patron be seen from the inside out and not merely to detail every concretion of the skin or every wrinkle of the neck unless these were traces of a specific inner grace. In his 1698 *Lecture on Expression* Le Brun advised:

The brain thus filled sends out these spirits to the other parts by means of the nerves, which are like so many little filaments or tubes which carry the spirits into the muscles, varying the amount to suit the need of the muscles in performing the action to which they are called.

[...]

The soul being linked, as I told you, to the whole body, every part of the body can serve to express the passions ... (Edwards 30)

Marrying Descartes to the *Physiognomonics* Le Brun rationalizes the connection between internal states and external appearances. Portrait painters must learn to depict the soul of the sitter from the outside-in. As an unusual sign of continuity, Le Brun's lecture was preceded by André Félibien des Avaux' s *Conférence de l'Académie de Peinture et de Sculpture* (1669) in which Félibien classified objects in order of status with still life at the lowest and human figures at the highest for the closeness of their form to that of God (Edwards 34-35); and followed by Sir Joshua Reynolds' argument against servile copying and for the ideal representation of nature throughout the famous *Discourse on Art* he delivered between 1769 and 1790. As Reynolds made clear in "Discourse III "[t]hat a mere copier of nature can never produce anything great; can never raise and enlarge the conceptions, or warm the heart of the spectator" (Reynolds 41). So I ask: "How could photography have been invented under those circumstances?"

Artists did use the camera obscura in their activities –most of all as a teaching aid. Today some controversy has arisen as to their utilization in the completion of actual paintings. But if cameras were deployed by the old masters the devices were little more than calculators in the service of precision and not of

realism which are not the same things. The camera was able to literally figure out difficult perspectives in the reproduction of complex patterns, for instance (Hockney, Steadman). However perspective, once again, was understood as the projection of a three-dimensional world on a two-dimensional surface; as far as natural philosophers were concerned it was nothing more than trickery. Western culture will have to wait for modernity to articulate sight, vision, visuality – its social companion – and mind as equally objective fragments of the same newly minted subject. Until then, neither Platonic rationalism nor Aristotelian empiricism could conceive the need for photography or the possibility of its existence.

#### The State of the Prosthetics of Vision

After exposing an entirely intellectual line on reasoning attached to the concept of vision I would like to briefly suggest a materialist argument. If the number of people wearing eyeglasses today is any indication, a large fraction of the seventeenth and eighteenth century population must have needed their sight to be corrected for myopia or other vision problems as well. Corrective glasses at the time were available but they were heavy, expensive, and far from the quality of modern optics. Glass without bubbles or streaks was difficult to obtain and lenses took days to grind to the proper shape. For this reason most spectacles were outfitted with convex lenses to correct farsightedness (presbyopia) which was an impediment to reading. Until the advances of the industrial revolution, for many luminaries like for everyone else, nature was most often a blur of ill defined shapes. Thus physical reality and the state of prosthetic technology put vision at a

disadvantage in particular against touch which was believed to be more consistent and reliable.

The natural philosophers used the camera obscura as a simplified model of the eye and for astronomical observations. But the camera obscura didn't explain the phenomenon of vision entirely. For instance it didn't show how the upside down image forming in the eye was seen right side up, in addition the camera obscura stripped the third dimension from the depth of nature. Despite its usefulness in the interpretation of perspective the camera obscura was also shunned by artists (Oettermann 29). While it was a widely accepted pedagogical aid in the teaching of perspective drawing the camera obscura was thought to be an instrument for soulless copyist. If a professional painter used a camera obscura to help with his work it was as we use a calculator today to facilitate a mathematical operation – the calculation of correct perspective in that case. And those of the old masters who did use a camera obscura did their best to hide the fact.

Despite the claims of some twentieth-century artists and critics like David Hockney and Philip Steadman, historians have been unable to find written accounts of the use of camera obscura in the studios of any of the most celebrated masters such as Velasquez, Vermeer or Rembrandt. At the beginning of the nineteenth century the camera obscura was still a servile accessory to both art and science but not yet the legitimate heir to either families.

In any case, imagining photography was prevented by two major obstacles. The first one concerned the invisibility of the subject. The subjective pictures of the mind embedded in the soul – itself embodied in the brain – did not exist

outside a realm of representation unmediated by thought – painting we have seen belonged to a category of mediated images. This situation alone would keep the very idea of photography from coming into being. The second obstacle was simply a matter of mechanics. Assuming that the images representing ideas and memory residing in an immaterial, un-substantive form inside the mind could be captured the lens of the camera obscura simply couldn't be placed inside the head were it ought to be to see true images. Thus to become reality, the pictures of the mind would have to find a way out of the brain. In other words, they would have to be projections of the mind in the material world. In this case the metaphor of the magic lantern may be more appropriate than that of the camera obscura.

# CHAPTER II

# TURNING THE MIND INSIDE OUT: THE CALL FOR PHOTOGRAPHY

A particular set of social conditions prompted humans to imagine photography as a means to express and cope with those conditions. However the social and intellectual structures which made photography possible appeared several decades before the invention of photography. This chapter begins with a thorough examination of the variety of strategies that were designed as stopgap measures before photography emerged as the ideal solution. One of those measures relied on the mechanics of the magic lantern, a camera obscura turned inside out.

The magic lantern has the particularity of being able to project an image of whatever object was introduced inside it between the lens and a source of illumination. If the images of the mind could have been inscribed on a piece of

glass, the magic lantern could have been the instrument capable to showing them for all to see. This is what would eventually happen with the phantasmagoria long before photography was invented, but out of the same necessity: the need to reconcile subject and object. The panorama and the diorama developed concurrently with the phantasmagoria were also projections of the mind. The large panoramic paintings making the images of panoramas and dioramas were an incarnation of the ambivalent role of the magic lantern as an inverted camera obscura, and thus on a giant scale. Following an exposé of the function of the magic lantern this chapter examines the social function of panoramas and dioramas as instruments of a strategy of epistemic stabilization.

While the magic lantern and the camera obscura are virtually the same instrument, the former was not commonly part of the scientific arsenal of the seventeenth and eighteenth centuries. Its principles were most thoroughly exploited by Athanasius Kircher,<sup>12</sup> a Jesuit priest who had a strange fascination for magic and became famous for his work on magnets and on optics. After Kircher elaboration of the theatrical potential of the device in *Ars Magna Lucis et Umbrae* in the late 1600s, the projective capability of the camera obscura was kept out of the philosophical meditations of the Enlightenment thinkers. Projection is said to have been used in the study of astronomy whereby a telescope could be outfitted in such a way that the image – probably of the sun– could be safely examined on a screen for indirect rather than direct observation.

<sup>&</sup>lt;sup>12</sup> Kircher is often credited for the invention of the magic lantern in 1646 date of the first edition of his *Ars Magna Lucis et Umbrae* but a description of the apparatus is only included in the second edition of the work in 1671 some 12 years after Huygens's version.

But for the philosophers the magic lantern – not named magic until 1668– was relegated to the province of entertainment and charlatanism until it was fully embraced as a pedagogical aid starting in the late 1700s (Hankins 59-61).

### The Magic Lantern and the Theories of Vision

The magic lantern had the particularity to be able to project an image of whatever could be inserted inside it between the lens and a source of illumination. Enlivening the metaphor and/or mechanics of the magic lantern to objectify the projections of the mind would have required the revival of the theory of extramission. Extramission was the belief that light radiated from the eye rather than from the sun. It was a conjecture that had been dismissed by natural philosophers from the late Renaissance onwards. As a viable theory it was given a final blow by Johannes Kepler, in1604. Kepler was the first scientist to submit the idea that images formed on the retina. Before that time extramission, in one aspect or another, had been in and out of favor since the Antiquity. It was adopted by Plato but rejected by Aristotle; still it endured to be theorized by Euclid along with the rules of geometry so useful to Descartes. In the second century A.D., Galen gave the first comprehensive theory of the phenomenon. Galen believed that images flowed from the brain to the eye through the hollow optic nerve. Those images were then projected outwards from the crystalline lens that forms the middle of the eye (Wade 21, 55). Galen's anatomical description found some currency until the early seventeenth century. Galen's projection theory was questioned by Alhazen in the eleventh century. The Arabic scholar used the principles of the camera obscura, and the fact that the eye could be injured by too

much sunlight, to dispel the myth of extramission. Alhazen and his contemporary Avicenna advanced the theory of intromission whereby images enter the eye from the outside through the pupil. Unfortunately for European scholarship the work of those scholars was not translated from Arabic to Latin until the late thirteenth century; thus the theory of extramission persisted until the fifteenth century (Wade 56). Master Nicolaus' description written in the twelve century is a typical illustration of the principle of extramission or projection from the eye:

> The optic nerve, which descends from the brain to the eyes, passes through the center of the eye as far as the crystalline humor, through it comes the visible spirit, and as it emerges through the uveal tonic and the cornea it is mingled with clean air and transports its rays to the body, and thus sight is brought about (Findlen).

The theory of extramission was confronted with two major problems: the difficulty of explaining night and the question of the consistency of vision between individuals. To lift the first obstacle Plato used a tautological reasoning maintaining that the rays from the eye were extinguished by darkness like water extinguishes fire. Conversely Aristotle took the difficulty of seeing at night as the proof that light came from the sun, but he had no detailed explanation of the phenomenon of vision. For Plato the second dilemma was resolved by the concept of ideal form whereas everyone would project more or less identical copies of ideal forms. Aristotle didn't have this problem and his theory of vision was at the basis of his empiricism while the Platonic theory of vision accommodated an idealist conception of the world. The shadow of the Greek philosophers continued to loom large in the thoughts of the Enlightenment. The connection of idealism

and empiricism to the theories of vision accounts for the endurance and coexistence of both extramission and introjection through out the centuries. The mostly British empiricists were Aristotelians, while the continental rationalists found most of their inspiration in the works of Plato. Thus the pre-Christian debate on the physiology of vision carried through to the distinction between empiricism and rationalism.

Leonardo Da Vinci went from supporting extramission in 1480 to rejecting it in favor of intromission in 1490. But it was Kepler's observation of retinal images that ended the speculative theories of vision by asserting the scientific evidence of the theory of introjection. A few years later in 1619 Christoph Scheiner formulated the methods for correcting errors of refraction in the eye and in the camera obscura. From then on the lens-equipped camera obscura, already several decades old, became the only model for the eye. (Wade 14-15). In her exploration of the metaphors of the camera obscura, Sarah Kofman explains at the outset that:

> The history of science shows us that the camera obscura imposes itself as model of vision in order to do away with that Euclidian conception according to which it is from the eye that emanates the luminous ray (3).

In this passage Kofman makes clear that the camera obscura specifically disproves projection theories. Thus the empirical model offered by the magic lantern – extramission – was rejected off hand by the Enlightenment's philosophy of vision.

The magic lantern, which will prove so crucial to the expression of the nineteenth- and twentieth-century philosophy of vision, held a substandard place

in the scientific instrumentation of the seventeenth and eighteenth centuries. Unlike the camera obscura the magic lantern couldn't even provide a valid model, and even less a metaphor, for vision. The dramatic change in the status of the magic lantern at the end of the eighteenth century shows the extend of the epistemic reversal happening at that time.

Pushed by the dynamics of the transition from the Classical to the Modern epistemic regimes the magic lantern and its projective capabilities became essential elements of the early nineteenth century strategy of epistemic stabilization.

#### From the Camera to the Projector and Back

Rare and isolated instances of literary conceptions of photography appeared in the second half of the eighteenth century. *Giphantie*, a utopian novel written by Charles-François Tiphaigne De La Roche in 1760,<sup>13</sup> is sometime cited in histories of photography and cinema (Eder, Bazin) for including what appears to be a prescient depiction of photography:

> You know that the rays of light, reflected from different bodies, produce an image and that the object delineated on all polished surfaces, as on the retina of the eye, in water and on mirrors. The elementary spirits have studied how to fix these fugitive images. They have composed a most subtle substance which is very viscous and prepared so as to dry quickly and harden; by the help of which a picture is produced in a few moments... [nature] with a sure and never-erring hand, paints pictures on

<sup>&</sup>lt;sup>13</sup> The novel was translated in English in 1761. Giphantie is an anagram of the author's name.

our canvas which deceive the eye and makes one's reason to doubt whether the so-called real objects are not phantom of the imagination... (Tiphaigne De La Roche qtd. in Eder 90)

Eder dismissed this description as a poetic fantasy which was either inspired by "ideas which we found expressed thousand of years earlier by the Roman poet Statius" (Eder 89) or by the author's awareness of Schulze's work in chemistry. More significantly, Tiphaigne De La Roche chose not to use a camera to create Giphantie's pictures instead; they are reflections on a canvas, and the retina is akin to a mirror. Thus *Giphantie* was dismissed as a fantasy since neither Eder nor any other historian of photography consider photography to have been invented independently of the use of a camera.

Giphantie's magical canvases, coated with the "most subtle substance which is very viscous and prepared so as to dry quickly and harden" held a space for the reception of the projected, as well as introjected, image; and, in the novel like in the critical discourse, a space laying between reality and imagination.<sup>14</sup> Whether or not Giphantie's canvasses were prophetic of photography should be determined by the fact that it almost certainly announced the imminent arrival of the phantasmagoria. The fantastic projections of the phantasmagoria – alleged materializations of the images of the mind – were, I will argue, in many ways the foremost precursor of photography.

<sup>&</sup>lt;sup>14</sup> Giphantie's pictures belonged to what the object relations psychologist D.W. Winnicott called a transitional space.

The Place of the Magic Lantern in the Philosophy of Vision

The first mention of a projective device resembling the magic lantern preceded Da Vinci's detailed record of the camera obscura by some seventy years. It was left in a 1420 manuscript written by a Giovanni da Fontana who lived from 1395 to 1455. (Mannoni 30). While the camera obscura saw almost continuous improvements from the beginning of the sixteenth century onwards, projection apparatuses experienced a developmental hiatus of more than two centuries, perhaps due to their closer association with sorcery than with science. More than seventy years after Della Porta's *Magea Naturalis*, and over a decade after Kircher's work, the first truly functional magic lantern was fashioned in 1659 by the hand and the ingenuity of Christiaan Huygens (1629-1695), a Dutch mathematician and physicist. But despite this illustrious pedigree the magic lantern was relegated to the province of charlatans. The magic lantern was never truly rehabilitated as a research tool. It was returned to a higher function as a didactic aid to project illustrations after research and teaching became separate activities in the mid- eighteenth century<sup>15</sup> (Hankins 47).

By the end of the eighteenth century the magic lantern had been in the care and feeding of ghouls, witches, and posses of devils for several generations. Indeed Huygens's first slides were of a dismembered skeleton juggling with his own head. But at that time, projectionists kept the intricacies of their technology secret to maximize the effects the projection of fantastic images had on their audience. When illusions were denounced, it was to warn the curious and gullible

<sup>&</sup>lt;sup>15</sup> Research and teaching were reunited one hundred years later at the insistence of Alexander von Humboldt at the University of Berlin (Recht 92)

that, as scary as they were, the specters were only deceptive fakes – necessary warning in a time that gave preeminence to apparitions over hallucinations. For the ordinary citizens of the Enlightenment the hideous monsters populating the netherworld were as real as anything else. They readily believed that ghostly characters would sometime cross the forbidden boundary between the world of shadow and that of light to seek revenge, or when (impudently or imprudently) summoned by black magic. At that time, spirits may have been the product of uncontrollable forces but they never were that of the viewer's own mind. Hallucinations, later understood to be the creation of an ailing mind caused by an unwell body, were then identified as apparitions – actual concretions of spiritual matter. Under the pretense of debunking the common belief in apparitions some ingenious showmen created an entire new genre of spectacle that used a sophisticated apparatus based on a powerful magic lantern and cleverly designed slides. One of those men of mystery, Étienne-Gaspard Roberson, baptized his own show "The Phantasmagoria," a name that came to designate all such displays.

# Phantasmagoria: The Projection of the Images of the Mind

The phantasmagorias of the late eighteenth and early nineteenth centuries were one of the first symptoms of the movement toward the construction and objectification of the modern subject. It took the turning of the camera obscura inside out –making it into a magic lantern– to illuminate the subject profiling on the horizon of the nineteenth century. However the complete recovery of the subject could only be expressed possible by multiple and increasingly concrete means to materialize the processes of the mind. At the same time secularism

stamped the soul with the frail attributes of the body leaving the former vulnerable to the affliction of the latter. The phantasmagoria as a genre was also the expression of the fear of seeing that reason was suddenly contingent on the health of the body; and that mind and body together were subjected to instability and decay. The concretion of the mind within the body was destabilizing a system of knowledge that had relied on the autonomy of thought to make sense of the reality of the world – exemplified by Descartes's famous words: "Je pense donc je suis" (I think therefore I am) (*Discours de la Méthode* VI, 32).

The phantasmagoria turned into a popular entertainment on the cusp of Modernity, at the end of the eighteenth and beginning of the nineteenth centuries. It is said to have been the ancestor of the motion picture (Quigley, Cook, Mannoni). However my work is not concerned with the technological history of cinema but addresses the social and intellectual history of photography exclusively. The congruence of the histories of cinema and photography has always been taken for granted, so it comes as no surprise that the two media would be found in the same cradle at the onset. However, my analysis is squarely situated in social history, or more exactly in the philosophical expressions which precede social manifestations, rather than technical history. Traditional cinematic history, on the other hand, is uniquely concerned with the technical genealogy of the media. Therefore what appears to be parallel or even converging technogenetic vectors may in fact be discerned, from a social perspective, as diverging over time. Therefore, I urge the reader to remember Deleuze's words cited earlier: "[t]he machine is social before being technical..." (Deleuze 39). The precedence of the social over the technical opens the possibility that disparate social

requirements may give birth to a single technical manifestation just like multiple technical developments can converge to satisfy a single social need. In other words photography and cinema may to a large extent share a technology without necessarily having to share the same social purpose, or to both satisfy the same social desire. Therefore I urge the reader to consider connections between photography and cinema in light of the need to express multiple facets of a philosophy of vision rather than as a single technological feat.

According to Laurent Mannoni, the phantasmagoria arrived on the scene c.1780 and was reported in several publications of the time. Mannoni tells us that a pamphlet by Henry Decremps, a professor of physics who was also a magician, narrated the experience of a young man caught "at the heart of an optical storm" (137). The disturbance in question was a spectacle enacted in a dark chamber and consisting of projected images of skeletons and other frightening pictures all the while creepy sound effects enveloped the room. According to Mannoni, Decremps's early description became the template for the enactment of all subsequent phantasmagorias. We should notice as well notice that in 1774 (a date almost matching the first bracket of Foucault's periodization) a German Gespenstermacher (ghost-maker) named Schröpfer offered the good people of Leipzig the opportunity to visit with the soul of their dearly departed. The necromancer had built an apparatus that illuminated a cloud of smoke with an image the dead person. Of course, Schröpfer didn't care to disclose the secret of his expertise to the public but subsequent operators were not as reticent. Magic lantern operators were quite openly discussing, and even publishing, the

mysterious ways of their practices, but only to the point were it would promote rather than endanger their business.

In the late 1700s the diffusion of Newtonian physics made it more difficult to accept the substantive Cartesian dualism positing the separation of the immaterial mind and tangible body into res cogitans and res extensia. Kant's epistemic dualism (Stent 580), although tentative and incomplete, may have been the spirit's final and fatal step after Descartes had located the nest of the soul in the human brain. With Kant the soul lost its autonomy to the body, both being equally reduced to conditions of their relative environments – the practical reason of the supernatural moral individual and the pure reason of the natural world of objects. The study of the separation of the senses already hinted at by Spinoza over a century before was finally brought to the domain of the physical sciences in the early 1800s. The fragmentation of the human sensorial apparatus into anatomical peculiarities transformed the body's nervous system into the electrified frame of the spirit. The stimulus proper to each of the senses was reduced to an electric current stimulating the brain. Conversely replacing a given sensorial stimulus by a jolt of electricity to the appropriate nerve stimulated the corresponding sensation whether a flash of light, a whiff of perfume, or a tone in the ear. But those developments were already inscribed in the culture of spectacular illusions: Robertson experimented with Galvanism<sup>16</sup> and became an acquaintance of Alessandro Volta, another Italian pioneer of electrification; Johan Samuel Halle, a "ghost master" of the early days -circa 1784- used to conclude

<sup>16</sup> From Luigi Galvani an Italian pioneer in research on electricity.

his show by giving the audience a mild electroshock from wires hidden in the floor (Mannoni 141).

The period bracketed by Foucault to indicate the time of the epistemic fracture leading to modernity was a moment of heightened tension between the rational and the irrational. The phantasmagoria coupled with the appeal to reason opened possibilities which had been denied by the science and the philosophy of the previous centuries. The rational explanations of the mechanical fundaments of the illusions were paradoxically a means to affirm the feasibility of the materialization of the images of the mind. The phantasmagoria was at its most popular from the late 1780s until the 1830s just prior to the invention of photography. The magic lantern and the phantasmagoria were devices that bridged the Classical and Modern epistemes and announced the arrival of photography. While the magic lantern remained popular after the invention of photography,<sup>17</sup> the phantasmagoria only lingered in the metaphors ornamenting romantic novels to the point that it became a trope of the discourse of Symbolism and Romanticism. The origin of the phantasmagoria was symptomatic of a moment of "epistemological confusion" (Castle 159) which required the entrance of stabilizing strategies of which photography was to be the most visible by nature. Until then the painted slides and the projector served to express this historical epistemological anxiety while grasping for a remedy. Not surprisingly the phantasmagoria was constituted by a sort of bricolage. It was an assemblage which supplemented the mechanical apparatus with the discourse of rationality, or even better the emerging discourse of objectivity. The establishment of a

<sup>17</sup> The magic lantern saw its full potential realized in the invention of cinema.

standardized spectacle on the brink of becoming an institution – capitalizing on the ambiguous beliefs of a public in transition – was not to dispel old myths, as the phantasmagoria claimed, but to prepare for the synthesis of the object and the subject into one elementary representation.

Just three years after the French Revolution, a Philadelphia-born American going by the pseudonym of Paul Philidor introduced the Parisians of the late eighteenth century to the first rear-projection phantasmagoria. In a rear-projection set-up, which became the standard of the genre, a powerful magic lantern was hidden in a room behind a screen made of a white fabric rendered translucent by an impregnation of wax. Once the lights were turned off, and the room pitch black, a curtain opened up to reveal ghostly forms floating in the air. The projector, concealed by the screen, could move forward and back thus changing the size of the image to give the impression of the figures approaching or receding from the audience. The spectacle was accompanied by music and other sound effects such as thunder, wind, and rain – sound effects comparable to the Foley techniques of modern film dubbing. According to eyewitness reports published in European magazines of the period, the effects were truly captivating (Mannoni 162). Mannoni comments that the shows were always introduced by a "rationalist discourse" like the one reported here:

> I will bring before you all the illustrious dead, all those whose memory is dear to you and whose image is still present for you. I will not show you ghosts, because there are no such things; but I will produce before you enactments and images, which are imagined to be ghosts, in the dreams of the imagination or in the falsehoods of charlatans. I am neither priest nor magician; I do

not wish to deceive you, but I will astonish you. It is not up to me to create illusions; I prefer to serve education. (qtd. in Mannoni 144)

Along with rear projection and the mobility of the magic lantern, Philidor's duplicitous lecture became a customary staple of the phantasmagoria. In her investigation of the eighteenth-century predilection for the uncanny Terry Castle remarks:

In the process of the formation of the introspective subject of the Modernity the spectre-show of the late eighteenth and early nineteenth centuries, we will find, mediated oddly between rational and irrational imperatives. The producers of phantasmagoria often claimed, somewhat disingenuously, that the new entertainment would serve the cause of public enlightenment by exposing the frauds of charlatans and ghost-seers. (143)

Castle situates the phantasmagoria in the context of a history of epistemology. The phantasmagoria was not only an early manifestation of the rise of the subject as such but also an indication of the need for coping strategies designed to deal with the increasing destabilization of the epistemic regime at the end of the Classical period.

The next, and most remarkable, talent to enter the phantasmagoria business was Robertson, whose shows had a forty-year run from 1798 to 1837. His performances ended upon his death just two years before the invention of photography. Robertson –his real name Étienne-Gaspard Robert– had been educated in the seminary, where he acquired a keen interest in science and the physics of electricity. He moved from Liège to Paris in 1791 where he was a

private tutor for a while. In 1798, he turned down an offer to become a physics and chemistry teacher in his native province in order to stay in Paris. It was then that he began to demonstrate his genius for the elaboration of the phantasmagoria. First Robertson began to teach a class on the topic – a sign of the rationalist component of the practice. That same year Robertson had built a special projector with a powerful illumination system; he rented a commercial space in the center of Paris and began to advertise his phantasmagoria.

Judging by the content of his memoir, Robertson (the phantasmagore) foreshadowed the discursive identity of the first photographers by many years. With no uncertainty, he saw himself as a philosopher, a scientist, and an artist all at once:

> Robertson is a scientist, engineer, painter, optician; he is all that he has to be to work the greatest effects on the imagination through the senses, except that which he does not whish to be, magician, necromancer, in a century where all those tricks have vanished before the reason of man. (Robertson cited in Mannoni 151)

Including Robertson's disingenuous denial, those words seem to foreshadow photography's own connection to science, engineering, art, magic and death. In his well known exploration of the semiology of photographic images *Camera Lucida* Roland Barthes has most successfully expressed, maybe unwittingly, the inheritance of photography as a near parent of the phantasmagoria:

> And the person or thing photographed is the target, the referent, a kind of little simulacrum, any *eidolon* emitted by the object which I should like to call the Spectrum of the Photograph, because this word retains, through its root, a relation to
'spectacle' and adds to it that rather terrible thing which is there in every photograph: the return of the dead. (Barthes 9)
For Barthes and many others (Philipe Dubois, Christian Metz) photography has been defined by its association with death as much as by its grip on reality
-Dubois even renamed photography "thanatography." Hence, a photograph is a

remaining trace of the ephemeral as much as the index of the real. Like the phantasmagoria, photography holds a privileged place as a bridge between the material and the ethereal, the body and the mind, and life and death.

The dual relationship of photography to both the real and the unreal –what Bazin understood as "the ontology of the photographic image" in his famous 1945 essay bearing the same title– is in many ways a direct inheritance from the phantasmagoria.<sup>18</sup> Traces of this essence can be found throughout nineteenth–century gothic novels which made good use of the synthetic embodiment of mysterious attributes in the persona of the photographer. The most famous of all was the mysterious Mr. Holgrave. The daguerreotypist in Nathaniel Hawthorne's *The House of Seven Gables*, was thought to be practicing black magic in his room; he, like Philidor and Robertson, carried on under a pseudonym. Memories of an ancient past, a curse, and pictures of the dead were what fashioned Holgrave's story. Hawthorne's daguerreotypist, Jennifer Green-

<sup>&</sup>lt;sup>18</sup> The common genealogy of photography and cinema is thus reaffirmed but with a twist; this early relationship now holds the potential for reversing the famous critic's theory of the essence of cinema. Bazin held that photography was the essence of cinema. It was the theory that gave birth to the realist cinema of the French New Wave. However it looks like what is now termed "postmodern" photography (Cindy Sherman, Nan Goldin and Jeff Wall for instance) takes its inspiration from the narrative essence of cinema.

Lewis notes, "is presented here as a magical force and a supernaturally gifted authorial figure" (73).

The phantasmagore's magic, like that of its successor, the photographer, was to have been able to give the illusion of controlling time and to project the pictures of the mind in the world of things. Phantasmagorias then, like photographs now, were tangible images stolen from an ephemeral dimension and offered for public consumption. Despite its immanence the dimension in question remained palpable only by it appearances. The spectators of the phantasmagoria sat in the dark chamber facing the manifestation of the pictures that had first formed in their heads. The audience had physically broken through the previously impenetrable separation between thought and reality; it stood on the dark side of the retina, at least for a while. It is at this moment that the metaphor of the camera obscura reached its apogee and collapsed in an instant, for the observer was now physically inserted in (the camera obscura of) the mind.

The phantasmagoria came from the wish to rationalize the images of the mind, to turn the camera obscura inwardly, as it were, to capture ideas, memories, and phantasms in the hope to understand and control one's fate. It was the expression of the realization that matters of life and death were not God's exclusive dominion anymore. The predilection of the nineteenth century for spirits and their manifestations is not foreign to those familiar with Victorian literature. And, according to John Durham Peters's *Speaking Into The Air*, contacts with the world of "doppelgangers" were a complement of the nascent communication technologies which defined nineteenth-century modernity as a challenge to space and time.

But photography didn't sprout suddenly to turn into the instant remedy for the period's epistemic malaise. Concurrently with the phantasmagoria we can find several other visually oriented strategies paving the road to the invention of photography. The analysis of those strategies physical manifestations and social character give us important clues as to the genealogy of photography.

## Additional Strategies of Epistemic Stabilization

The number and variety of strategies of epistemic stabilization deployed in the late eighteenth and early nineteenth centuries are staggering; however they are all based on the same principle and pursue the same goal. Their method was to resist the ascent of the subject – to hide or to eliminate the subject wherever possible - and their aim was the edification of an episteme sheltered from the destructive impact of subjectivity. Not all those strategies were based on visual clues but all were meant to circumvent the unevenness of human beings. For instance, the metric system was adopted by the French revolutionary assembly in 1795 and mandated in 1837. The metric system took the dimensions of nature to generate its measuring units -a meter is one ten-millionth the distance between the North pole and the Equator, a kilogram is the weight of one liter of water and one liter is a cube with sides one tenth of a meter each. The old imperial system of weights and measures – still in use in the United States – was based on the human figure – an inch is the width of a thumb, a foot is the length of a human foot etc. In the realm of ethics, Lorraine Daston reminds us that objectivity has a history of its own. "Aperspectival objectivity," as Daston calls it, is today's most favored kind of objectivity. It is a "way of seeing" devised to institute common points of

view –thus eliminating individual perspectives– rather than verify the definite truth. Robertson of Phantasmagoria fame also invented "*La Femme Invisible*" in 1800, taking the disappearance of the subject to its logical extreme. The invisible woman was a show whereby spectators would stand in the middle of a vast room underneath a glass ball or glass case suspended from the ceiling. A soft woman's voice would answer any question coming from the group of onlookers. The sound of the feminine voice seemed to come from nowhere in particular thus creating the illusion that it was the disembodied voice of an invisible woman roaming the room.<sup>19</sup> Between 1800 and 1804, invisible women popped up in most of the capitals of Europe, but had vanished for good by 1850 (Matlock).<sup>20</sup> Whatever of the subject couldn't be eliminated would be kept under surveillance. Jeremy Bentham's ubiquitous Panopticon is now considered the prototype of many nineteenth-century spaces of visual management (Foucault 1977, Crary, Oettermann, Matlock, *et al.*). While non-visual strategies deserve their own investigation they remain outside the scope of this study.

# Panorama, Diorama: Stopgap Measures Before the Invention of Photography

The Panorama and the Diorama,<sup>21</sup> were two visual wonders which unfolded in the entertainment landscape of the post-Enlightenment period along with the

<sup>&</sup>lt;sup>19</sup> The trick was based on an audio rather than visual illusion.

<sup>&</sup>lt;sup>20</sup> Of course there was much more to the invisible woman than a symbol of a disappearing generic subject. Jann Matlock examines this phenomenon in the context of gender studies.

<sup>&</sup>lt;sup>21</sup> Today's dioramas which are found in museums of natural history and which are a combination of semi-circular panoramas and model reproductions, are not a far cry from the original Diorama.

phantasmagoria – for the sake of brevity I ignored the various incarnations of peepshows and mechanical theaters, that other late eighteenth-century ocular centric gadgetry which had the same origins and underlying purposes as the more public and spectacular panoramas, dioramas and phantasmagorias. In any case panoramas proved more resilient than their competitors; as of the 1997 publication of Stephan Oettermann's *The Panorama: a History of a Mass Medium* there were still over three dozen panoramas in existence throughout the world (345).

This section is dedicated to the mechanics and social functions of the apparatuses proper to the panoramas and Diorama. The analysis of these two spectacles popular in the early nineteenth century reveal that they were modeled on the camera obscura, or more precisely that, like the camera obscura, they were metaphors for the uncertain status of vision and visuality at the junction of the eighteenth and nineteenth centuries. Panoramas and dioramas were camera obscura on a giant scale. Rather than being portable they were the size of a building capable of accommodating several hundred people; they were designed and erected specifically to display very large images.

The first 360-degree panorama was conceived and realized, in London, by Robert Barker (1739-1806) who had obtained a patent from King George III. The acquisition of a patent did not just protect the inventor from unscrupulous competitors but it also subsumed, symbolically and practically, a mode of artistic expression to the rule of law. Therefore panoramas weren't meant to explore free expression but were integrated in a structure that regulated individual agency with a set of objectifying rules. Rules external to the operation of panoramas added an extra layer of tangibility to their existence and increased the weight of their social effect.

On the continental side of the Channel Robert Fulton obtained a French patent for his panoramic system as well. And the official status of the panorama was further endorsed in France by a government enquiry conducted by the Institut de France (Oettermann 146) a prestigious sanctioning body that consolidated five academies including *l'Académie des sciences* and *l'Académie des beaux-arts*.<sup>22</sup> The Diorama was equally patented by Daguerre both in France and in England; and it was further sanctioned by the French government in 1839 when Louis Jacques Mandé Daguerre received a pension for life for his two inventions, the Diorama and the Daguerreotype. Thus from the onset, Panorama, Diorama and Daguerreotype share more than just an aesthetic precept: they were "structuring structures" playing an important role in the organization of the social, economic, intellectual and legal spaces of the late-eighteenth and early-nineteenth centuries.

The first Diorama<sup>23</sup> opened in Paris in July 1822. As described by Laurent Mannoni it consisted of a large building 16 m high, 27 m wide and 52 m long housing a rotating auditorium 12 m in diameter capable of sitting 350 people. Facing the audience was a 7.5 by 6.5 m horizontal opening in the wall. As the entire rotunda holding the audience pivoted around its vertical axis on ball bearings the wall opening would align with one of two large painted screen

<sup>&</sup>lt;sup>22</sup> The other three were l'Académie des inscriptions et belles-lettres, l'Académie française and l'Académie des Sciences morales et politiques.

<sup>&</sup>lt;sup>23</sup> After the opening of the initial Diorama in Paris and the one in London both built at the initiative of Daguerre several imitators popped up throughout Europe, but the better known, most celebrated, and the only ones I discuss are the originals. Hence I will capitalize Diorama to refer explicitly to Daguerre's establishments.

distributed around the structure – a third stage was reserved for works in progress. The paintings were separated from the audience by a proscenium some 13 m deep similar to that of a theater but entirely framed in black in order to confound the frame with its surrounding. The giant canvasses, some 23 m wide by 14 m high, were made of light fabric which was painted with an image on both side. (Mannoni 187). In one of the favorite topics of the Diorama in France and in England, Gothic churches in various stages of decay, the image on the front would be the interior of the church in daylight while the one on the back would be the same view at night fall. By varying the lighting ratio between front lighting and back lighting the images could be made to combine and to fade in or out of each other.

Daguerre and Charles Marie Bouton, his business partners, were acclaimed set designers for the theatrical stage and the Paris Opera. The two artists had such control over the lighting effects that they could simulate the passing of a twelvehour period of time within fifteen minutes. Daguerre and Bouton were capable of designing very sophisticated effects such as changing the appearance of the weather or filling and emptying the pews of the church during midnight mass – a simulation that was used repeatedly.

The Diorama and its imitators complemented the epistemological function of panoramas, but where panoramas froze time in the unfolding of space, the Diorama displayed the unfolding of time in a limited space. For our purpose we will make little difference between panorama and Diorama which, despite their technical and aesthetic differences, relied on similar visual tricks and knowledge

of cognitive behaviors. In his pre-cinematic history Laurent Mannoni describes Barker's Panorama which became the model for all subsequent panoramas:

> The spectator was admitted onto a raised platform, in the center and about halfway up a cylindrical room with a conical roof, to view a large painted canvas stretched around a circular wall. This 'panoramic' view represented a landscape or a battle scene, a monument or some similar object. It was carefully created, with perspective, 'depth of field', and chiaroscuro effects. The canvas (which was effectively endless, since its two ends met and joined the picture continuously) was lit at an angle from above, through a glazed opening formed in the roof of the building. (176)

Like phantasmagorias, panoramas and dioramas became instant successes wherever they were built in Europe. Trying to circumvent Barker's patent French and German inventors each in their own country proposed several technical improvements to the original Panorama. One of those enhancements (proposed by Fulton) would have allowed to effortlessly alternate up to eight canvasses.

Fulton's system was never constructed and the rights to his patent were bought by an other American entrepreneur, James Thayer. In September 1799, Thayer opened his panorama in the Jardin Des Capucines sufficiently close to the entrance of Robertson's "*Fantasmagorie*" that the latter worried that the superior artistic quality of the competing attraction would undermine his business.

In Germany Adam Breysig, a set designer and an expert in rendering perspective,<sup>24</sup> had conceptualized the panorama independently from Barker at about the same time. By the first year of the new century panoramas operated in

<sup>&</sup>lt;sup>24</sup> Breysig even wrote a pamphlet explaining how to calculate perspective in various situations.

Hamburg, Leipzig and Berlin. The simultaneous conceptualization of the panorama in England and Germany, and its swift development in France, indicate the transnational character of the responses to the threat of epistemic destabilization within the relatively homogenous western European cultural environment. Panorama and Diorama were a paradigmatic responses to an epistemic problem that ultimately found a durable solution with the invention of photography.

## A Panorama of the Panorama

Panoramas came at a time when the integration of the mind with the body was overtaking Cartesian dualism. The creation of an interiorized but stable representation of reality was an attempt to reconcile the knowing subject and the intelligible object within a predictable relationship protected from the potential failure of a mind subjected to the vagaries of the body. Panoramas were at once an expression of the anxiety generated by an increasingly wavering episteme, and an attempt at providing a stable epistemic foundation.

The word "panorama," which became a generic term like kleenex and frigidaire almost immediately, didn't come from ancient times but was especially minted in 1793 for Robert Barker's New Panorama on Leicester Square in London<sup>25</sup> (Oettermann 105). Many of those panoramas displayed landscapes that were already familiar to the inhabitants of the cities where they had been set up. In London, along with *The Battle of the Nile*, Barker exhibited *London from the* 

<sup>&</sup>lt;sup>25</sup> "Panorama" is a combination of the Greek root *pan* meaning all and the word *horama* meaning view.

*Albion Mills. Southwark.* In Paris, Thayer was presenting a painted view from the Pavillion des Tuileries which, at the time, offered an encompassing view of the most important architecture of the city. From a survey of Stephan Oettermann's *Panorama: History of a Mass Medium* one can easily conclude that the staging of vistas already familiar to the public was a trope of panoramas world wide. The panoramic landscapes were most often alternated with minute depictions of battle scenes which were faithfully painted according to the testimony of eyewitnesses. In some cases the painter set out to the location of the event in person. For instance, John Thomas Serres drew the sketches for his much admired *The Pandemonium of Boulogne*, a depiction of the 1804 blockade of the French harbor of Boulogne<sup>26</sup> by the British fleet, from the deck of the *Leopold* the flagship of the Royal Navy during that event (Oettermann 125-126). When live witnesses weren't available the event was reconstructed from military reports and other accounts.

The urban landscapes like the battle scenes, by far the favored topics of panoramas, were not representation of the hand of God – as natural landscapes and most of the art from previous centuries might have been – but depictions of the handy work of man. However they didn't tell of humanity's triumph over nature but of the conquest of "man" over what it perceived was its own nature.<sup>27</sup> The detailed panoramas of the large Western European cities, especially when shown to their own inhabitants, were not representations of the domination of the

<sup>&</sup>lt;sup>26</sup> The Royal Navy was blocking the French harbor of Boulogne to prevent the immanent invasion of Britain by the Napoleonic army.

<sup>&</sup>lt;sup>27</sup> n each of the countries were a battle scene was on display it was that of a victory While the British painted the 1804 blockade of Boulogne the French represented the 1793 retreat of the British and Spanish fleets in Toulon.

natural order but of the mastery of the social order. They stood for the objectification of the subjective, and were an affirmation of human's power over *human* nature.

Panoramas were touted as a mode of travel without the dangers and discomfort of actual travel; but images of foreign lands and foreign cities were surveys of the colonial projects of the European nations; and thus participated to the internal justification of those nations' "civilizing missions." The panoramas of exotic foreign cities like the panoramas of battle scenes were depictions of the encounter of nature and culture, rather than the expression of a fanciful desire to see the world. As the reviews of the many Panoramas of distant cities, like Rio de Janeiro, Mexico, or Lima painted by Burford testify exotic places always depicted a mix of the civilized and the wild. Like the urban panoramas of a foreign cities they sometime replaced images of battle scenes illustrated the clash of the civilized and the uncivilized. These encounters of the tamed and the wild were sometime described more explicitly as in this review of Burford's panorama of Calcutta in *The Times of London*:

> The river covered with the boats of the natives, and the ships of European structure, forms an important feature of the Panorama, and the distant buildings, consisting of country houses and villages, give an agreeable finish to the distance....

> The native prince, mounted on an elephant, and attended by a numerous escort, is one of the gayest and most prominent part of the assembly; one of those infatuated devotees, who perform a kind of voluntary penance, by being swung in the air at a distance of 20 feet from the ground, suspended by a hook

inserted in the muscle of the back or breast ... (Panorama of Calcutta)

And the reviewer to continue with a detailed description of a religious festival involving "the whole of the motley population." The "boats of the natives" assumed to be primitive are set against the modern structure of the European boats, and the domesticity of the white men "country houses" contrast with the roughness of the native "villages." In this particular review the encounter between the tamed and the wild is further symbolized in the representation of the native customs themselves.

When depicted as battle scenes the encounters between savagery and civilization appeared much less benign. Consider this narration of the panorama of the battle of Navarrino also published in *The Times of London*:

The attention of the spectator is, however, chiefly and justly riveted on the most important part of the action, the opening of the fire of the *Asia*, which, ... is pouring in gallant style her annihilating bullets into the unfortunate vessels of the Turkish and Egyptian Admirals, the gaudy trappings of which form a good contrast to the plain, solid, and compact appearance of Sir E. Codrington's ship. (Panorama of the Battle of Navarrino)

The streamlined look of the vessels of the British Navy is opposed to the organic shapes of the Turkish and Egyptian fleets. In this description even the aesthetics of the ships carry the symbol of the differences between civilized and uncivilized, culture and nature.

Phantasmagorias, panoramas and dioramas were all introduced to the public with a form of rational discourse. Panoramas like phantasmagoria were an ensemble made of pictures and words – brochures, advertisements, and reviews. The panorama's *assemblages* included the mention of information that tend to rationalize the representation; for instance, the size and surface area of the paintings were almost always part of panoramas' advertising campaign. In the same promotional material the public was forewarned as to the deceptive nature of the images. The following is an extract from the January 10, 1792, of an advertisement published in the *Times of London* for one of Barker's Panorama:

The public is most respectfully informed that the subject of the PANORAMA painted by R. Barker, Patentee for the invention, is a view-at-a-glance of the CITIES of LONDON and WESTMINSTER, Comprehending the three bridges represented in one Painting, containing 1479 square feet, which appear as large and in every respect the same as reality. The observers of this Picture being by painting only deceived as to supposed themselves on the Albion Mills from which the view was taken. (cited in Oettermann 101)

A decade later, another famous panorama painter Thomas Girtin advertised *Eidometropolis*,<sup>28</sup> a panorama of London, "which contains1944 square feet" (Girtin quoted in Oettermann 120). The publication of the physical characteristics of the images was a crucial step toward the objectification of the representation; we will see that accuracy and truthfulness would be two more.

Besides managing canvasses of mammoth size and weight the most remarkable achievement of panorama painters was their ability to create images which could be seen with the correct perspective from an almost infinite number

<sup>&</sup>lt;sup>28</sup> Eido for the Greek *eidon* (I saw) or *eidos* (idea or form). In the mind of its creator the *Eidometropolis* may have represented the ideal form of the city as it was.

of point-of-views.<sup>29</sup> Unlike the anamorphic Albertan perspective practiced since the early-Renaissance –which is based on a point of view that can only accommodate a single observer at a time– panoramas made the artifice of perspective equally transparent from all locations effectively erasing the position of the privileged subject.<sup>30</sup>

In today's term, the style of painting used to create the room size panoramic canvasses would be referred to as hyperrealism; a manner of painting that produces work virtually indistinguishable from a photograph. The hyperrealist (photography-like) appearance of panoramas turned them into a combination of art and science – a qualification that photography will take as its own. And more importantly the critical discourse, which, most likely, repeated the information printed in the brochure handed to visitors, gave all the technical details pertaining to the "taking" of the image –a term already in use in the 1790s some three decades before the invention of photography. Specifications would include the height of the point of view, the time of the day, the atmospheric conditions and some time the actual distance of various elements from the observer. In his review of *The Pandemonium of Boulogne*, for instance, the writer for the *Journal of London und Paris* let us know that "the *point of view* is taken from a height of twenty four feet" and that "One sees Fort Napoleon about three hundred *toises* [50 feet] from the mouth of the harbor."

<sup>&</sup>lt;sup>29</sup> The production of those paintings like their appreciation were collective enterprises.

<sup>&</sup>lt;sup>30</sup> The hopes for democracy was also expressed in the design of theatrical set and was consistent with the political mood of the time.

Panoramas and dioramas<sup>31</sup> were apparatuses that exploited a special architecture to display colossal paintings illuminated with dynamic lighting effects. More than any other type of building the architectural structure of panoramas and dioramas delimited interior and exterior spaces both physically and metaphorically. Panoramas and dioramas were gigantic camera obscura if not in the exact scientific principle at least in their internal appearance and general spirit. Despite the restricted dimensions of their artificial environment<sup>32</sup> the view spreading around the enchanted spectators seemed to be almost without limit reaching all the way to what appeared like a natural horizon. In the combination of metaphor and mimesis that makes the apparatuses of panorama and Diorama alike, we can recognize the modern expression of the interiority depicted in Vermeer's paintings *The Geographer* and *The Astronomer*. However after more than one hundred years of a history marked by dramatic changes in philosophy, politics and the economy the model of human insightfulness revered by the old master was now redefined by its situation on the edge of an epistemic reversal.

The reconciliation of nature with human nature was accomplished by a series of multiple erasures whose objective wasn't to make the invisible visible, as in traditional painting, but to eliminate subjectivity by asserting the materiality of all things. The first order of criticism, or praise, in the public's assessment of panoramic pictures was the subtlety by which atmospheric conditions were

<sup>&</sup>lt;sup>31</sup> Diorama was a term coined for the establishment L.J.M. Daguerre opened on Rue Sanson in Paris, in 1822.

<sup>&</sup>lt;sup>32</sup> The dimensions of Barker's panorama were 84 feet 6 inches for the diameter and 35 feet 9 inches for height; but over the years their diameters varied between 30 and 130 feet with heights between 16 and 48 feet with the ideal size having been determined to be, for cognitive reasons, around 100 feet in diameter (Oettermann 58).

rendered without degrading the sharpness of details. Panorama painters were celebrated for their mastery at reconciling aims that seemed to work at counter purpose, atmosphere traditionally standing for subjective perception while accuracy is a reminder of the invariability of the objective world. As the *Time of London* critic reviewing Burford's panorama of the battle of Navarrino told his readers:

The beauty of such portions of the sky as are seen peeping through the mountains of smoke, almost causes a regret to be felt that any of it should be obscured. But truth must not be sacrificed to beauty. (Panorama of the Battle of Navarrino)

Many reviews of panoramas point to the difficult compromises the painter had to face, but the rule of panorama painting were to always promote the truth and for the painter to repress his undisciplined artistic impulses. By the same token the review of Burford's *Pandemonium of Milton* one of the very rare panorama representing a work of fiction was criticized in those terms:

The difference between productions purely artificial and fanciful, and those which are built 'upon the rock of nature' is very wide, and in proportion as works of art recede from the sublime model, does the judgment concerning them become bewildered and uncertain. (New Panorama)

The reviewer find himself faced with a personal micro-epistemic crisis; he finds himself disoriented by a fictional panorama which seems to be on both sides of reality and fiction. The writer's bewilderment flows from the attempt at fusing the real and the sublime, nature and culture, in a medium developed to uphold the sort of knowledge "built upon the rock of nature." In this particular case the reviewer decides to succumb to "voluptas" rather than to try to sort out the ratio of truth to beauty.

The erasure of the viewing subject was performed concurrently with the erasure of the author, and by the same means; the extraordinary abundance of details which pushed the hand of the artist into the background did not leave any room for the imagination of the observer effectively blocking the subjective input of the viewer who remained a passive – if interested – spectator.

Before being able to admire those magical views, as they were qualified then as a sign of their extra-sensorial origin, spectators had to enter a long dark hallway. Then the audience had to climb up a slightly dizzying spiral staircase to emerge in the center of an elevated platform – to about half the height of the painting – surrounded by a balustrade.<sup>33</sup> This brief journey from the outside to the inside was meant to let the spectators' eyes adjust to a lower lighting level and to slightly disorient them – erasing as much as possible their impression of the outside. Once on the platform of the panorama the public could move around freely but remained separated from the image by a 20-to-30-feet space most often filled with what appeared to be a natural landscape. The top edge of the image was hidden from view by a canopy suspended above the platform; since the canopy didn't touch the canvas the image disappeared behind its edge therefore giving the illusion of extending upward to infinity. In this set up the image didn't appear to be formally framed, and was advertised as a picture without a frame (Oettermann 143).

<sup>33</sup> In the case of the Diorama viewer had to find their way to one of the 350 seats bolted to a semi-circular platform in the center of the dimly lit room.

To display a picture without an actual frame removes all references to external reality. The observers found themselves completely engulfed in an illusion which confounded the medium with the object of reality to create a reality which was literally and figuratively folded upon itself (Egginton 4). The images of the panorama produced a reality that was judged to be equal if not better than nature. Writing about the rendition of the landscape surrounding the city of Geneva in one of Burford's panorama the *Time of London* critic was literally transported:

> The beholder himself contemplating not a draught, but in reality the overpowering majesty of Mont-Blanc, and the luxurience of the vallies and hills which are strewn at its feet. His imagination stays not until he fancies he feels upon his cheek the breeze sweeping along the mellow waters, and wafting to his ear the delicious sounds of the lute and the guitar. (Panorama of Geneva)

This particular critic, being found of the Classics, quoted a verse from Virgil's <u>Æneid XII</u>, "*Non haec humanis opibus*" "This is done not of man's knowledge." Overwhelmed by the most perfect copy of reality the writer can't avoid expressing the complete erasure of the subjectivity of the painter – replacing it by the objectivity of natural representation – while projecting his own sensation into the painting in an exchange of objectivity and subjectivity which anticipates the need for the invention of photography. In this case the panorama painting accommodates both a subjective and an objective representation unlike traditional painting which, always mediated by human intervention and forced into idealizing conventions, can never incorporate a truly objective vision

#### The Effect of Excessive Mimesis

Panoramas were more of a curiosity than a work of art, a distinction that was going to be shared by the early Daguerreotype. Panoramas pertained to be simulations, perceived as exact copies of the real world. It was a characteristic that placed them on the outer fringe of representation and stripped them of the cathartic power of mimesis. In his comparative study of the work of Nicolas Poussin and Michelangelo Caravaggio, *To Destroy Painting*, Louis Marin analyses the characteristics of simulacrum as an excess of mimesis:

> [i]mitation maintains distance between the copy and the model, thereby allowing the mind and theory to examine the law by which mimesis is controlled and mastered. By eliminating the distance between the model and its copy, a trompe l'oeil traps the perceiving eye at the level of appearance-as-essence ... In as much as the trompe l'oeil generate stupefaction, it can have neither a contemplative nor a theoretical effect. (100-101)

The absence of contemplative or theoretical effect participates in the erasure of the subject to the profit of the object. The excruciatingly accurate copies of reality that were panoramas not only muted the subject from all sides but also conflated reality and representations in an attempt to inoculate knowledge against human irrationality. Panoramas were aesthetically hyperrealist and socially hyperrational. "More than just the aesthetic counterpart of a natural phenomenon, the panorama was both a surrogate for nature and a simulator, an apparatus for teaching people how to see it [nature]" (Oettermann 12). In 1829, for an extra sixpence over the price admission visitors could look at Thomas Hornor's massive panorama of London at the Colosseum with a camera obscura giving the public an

*avant-goût* of the ultimate remedy devised to cure the new century's epistemic malaise. It may make sense to want to experience viewing a landscape through the mediation of the camera obscura, but the double mediation carried out by the addition of the camera and the painting points to the century's obsession with the need to systematize and compartmentalize the relationship of nature and culture.

Critics contemporary of the panorama, like modern analysts, understood the encyclopedic rather than artistic nature of panoramas. Oettermann report this review of Hornor's panorama showing at the Colosseum, "Histories, descriptions, maps and prints, are all imperfect and defective when compared with the immense panorama – they are scraps and mere touches of the pen and pencil – whilst this impart at a glance *a Cyclopedia of information*" (137). Throughout late eighteenth-century European panoramas were a throwback to the safe episteme of the *Mathesis Universalis* of the age of reason while undertaking a massive instructional program unconsciously designed to reeducate a population faced with the vertiginous prospect of a radical reevaluation of the nature of knowledge.

In the process of assessing the transition between the eighteenth and nineteenth centuries Goethe again figures prominently as the representative of his generation. Here the poet tries to conquer his fear of height in order to enjoy unfettered the panorama from the top of the Strasbourg cathedral:

> ... I was especially troubled by a giddiness which came over me every time I looked down from a height ... And thus I attended the clinical course of Doctor Ehrmann, as well as the lectures of his son on obstetrics, with the double view of being acquainted with all conditions, and of freeing myself from all apprehension as to repulsive things. And I have actually succeeded so far, that

nothing of this kind put me out of my self-possession. (Goethe cited in Oettermann 13)

As Oettermann points out "What Goethe is here striving for is the elimination of all obstacles to achieving a cool and level headed view of things, a view unclouded either by subjectivity of physical frailty" (13). Goethe, who Crary chose as the poster child for the discovery of the subject, knew well the necessity to subdue the subject in order to "get a grip on things," but for those who weren't endowed with such insight – and also just in case – the half century between 1780 and 1830 devised many steadying mechanisms, the most successful of all proved to be photography.

#### CHAPTER III

## **1839: PHOTOGRAPHY RELEASED INTO THE WORLD**

Panoramas and especially the Diorama have aroused extraordinary interest on the part of photography and cinema historians in great part because Daguerre, a panorama painter and the co-inventor of the Diorama, was to become the official inventor of photography. Not to diminish his intelligence or his abilities, it seems that Daguerre was in the right place at the right time with remarkable consistency, which is to say that the social conditions of his time demanded particular inventions and he was one with the ability to deliver, but, as we will see, he wasn't the only one.

The years between 1816 and 1839 saw a flourishing of activities related to research in various photographic processes. Many of those research activities were conducted independently of each other. The upsurge in activities that began

in the early decades of the nineteenth century indicates a growing desire to photograph. In *Burning with Desire*, Geoffrey Batchen endeavors to determine the earliest traces of this desire which he finds in discourses originating in the mid-1790s. Batchen's analysis reinforces the notion of the rather sudden apparition of a language of photography.

In this section I will focus my attention on the discourse articulated at the moment of the public release of the earliest photographic processes. It is not surprising that those discourses, coming most often directly from the inventors and their closest allies, are the clearest expression of the motives behind the need for photography. I will pay particular attention to the proclamations of François Arago, Louis Mandé Daguerre, and William Henry Fox Talbot. Arago a French politician and scientist was Daguerre's proxy in the official unveiling of the daguerreotype at the French Academy of Science in the summer of 1839. Talbot was a British mathematician and linguist who developed his photographic process independently – it was a negative/positive system he baptized *calotype*. Despite their varied backgrounds these three men in particular, but others as well, were inspired by the same goal: that of devising a means to make pictures that removed the subject from the process entirely. It was a goal shared by many in vastly different fields, from the German Romantic poets to the scientists of the nineteenth century.

The duality of the modern episteme, which photography reflects, is best expressed by the enduring trope that defines its processes as both an art and a science. Faced with the uncertainty brought about by the discovery of human nature, and shaken by the spread of secularism, Western culture was forced to

conceive of an epistemic bedrock which would provide a solid foundation for both the knowledge of nature and the knowledge of the self.

The phantasmagoria, the panorama, and the Diorama provided tentative and incomplete solutions to bypassing the subject until the need for the grounding of the modern episteme became more pressing and better defined. Despite the skills of the painters and promoters of these spectacles the image panoramas and Dioramas submitted to the gaze of the modern observer were always already mediated by the hand of the artist, thus incapable of true objectivity. In the mean time the momentum of the cultural, economic and political dynamics that split reality into objective and subjective components kept accelerating. Photography was the ideal solution to the problem of the objectification of knowledge. It is striking to realize the zeal with which daguerreotypes were identified as creations of nature and not "creations" of human hands – the dual definition of photography was expressed with remarkable consistency.

The history of photography in the nineteenth century can be summarized as a struggle between objectivism and subjectivism. The initial discourse of photography, coming mostly from its inventors, was quickly supplemented by a discourse hinting at the creative potential of photography, especially when the process abandoned copper to use paper as a substrate (Rouillé 107). Even at the onset of photography the rhetoric of the first witnesses of the photographic processes was ambiguous qualifying the process as both art and science. An expression of this ambiguity can be found in the proselytism of the early advocates of photography who touted its benefits to the scientific community but downplayed its artistic value. Photography was considered then to be an assistant

to the arts rather than an artistic practice of its own; this situation would eventually change but not without a long and acrimonious debate. While the argument appears to have been settled sometime in the first half of the twentieth century, it is a discussion that lingers to this day. The persistence of the debate centering on the objective versus subjective qualities of photography is not the sign of an ambiguous status anymore, but an example of a discursive formation whose structuring function transcends its own field. In other words photography and its accompanying discourse are a broad channel to cope with the dual episteme of modernity. *Praxis* and criticism together offer a space of negotiation to maintain (or exploit) the equilibrium between subjectivism and objectivism. The conflict of objectivity versus subjectivity that appears proper to a particular practice has become a quasi-universal preoccupation, not because of the wide dissemination of that practice (however wide that dissemination may be) but because it is a *praxis* which epitomizes the philosophical problem of Modernity.

The daguerreotype had several drawbacks; it presented an image reversed from right to left like that of a mirror, and its opaque substrate didn't allow it to be used to make multiple copies.<sup>34</sup> On the other hand it showed exquisite tones and was sharp and very detailed – these last two characteristics proved to be the initial obstacle to the acceptance of photography as an art.

Daguerre's success was publicized in a special communication to the French Academy of Science by François Jean Arago, on July 3, 1839. With Arago's presentation the invention of photography had acquired a formal date of birth as well as a nationality. A fact later acknowledged by Talbot who concluded "A

<sup>34</sup> Other than by taking a new daguerreotype from the original one.

Brief Historical Sketch of the Invention of the Art" with those words: "[I] think the year 1839 may fairly be considered as the real date of birth of the Photographic Art, that is to say its first public disclosure to the world" (Talbot 1980 36).

Notwithstanding Benjamin's claim the large number of aspirants to the title of "original inventor of photography" did cloud the beginning of photography. Pierre Harmant<sup>35</sup> counted some two dozen claimants for the invention of the medium around 1839; at least five or six of those appear to have had legitimate claims; among them three Frenchmen: Niépce, Daguerre, and Hyppolite Bayard; one Englishman, William Henry Fox Talbot, a Brazilian of French origin, Hercules Florence; and an American, Samuel Morse<sup>36</sup> (Harmant 39). As noted by Geoffrey Batchen the most remarkable thing about this long list is that so many people professed to have had a long and deep interest in photography in the first quarter of the nineteenth century. The surge of awareness of the possibility of photography in the early 1800s contrasted sharply with the total absence of a discussion of photography prior to the closing years of the eighteenth century<sup>37</sup> (Batchen 52). By pointing to the sudden and vigorous emergence of the photographic discourse at the turn of the century Geoffrey Batchen offers an important clue as to the appropriateness of the timing of the invention of photography. Thus Batchen's research further confirms the periodic overlap of

<sup>&</sup>lt;sup>35</sup> Also cited in Batchen page 35.

<sup>&</sup>lt;sup>36</sup> The inventor of the telegraph and Morse code who was also a painter.

<sup>&</sup>lt;sup>37</sup> discounting <u>Giphantie</u> which may be, if considered generously, the sole exception.

two events: the epistemic upheaval suggested by Foucault, and the incidence of a discourse unveiling of the idea of photography.

Batchen finds the very first tangible expression of the concept of photography<sup>38</sup> in a 1794 monograph written by Elizabeth Fulhame. Batchen reports that Fulhame mentions the use of silver coated paper for the automatic duplication of maps in *With a View to a New Art of Dying and Painting* (28). Batchen unearth an expansive list of "proto-photographers" whose prose, he asserts, foreshadowed the invention of photography. In this list we find a mix of famous and forgotten names, among them:

> Henry Brougham (England, 1794), Elizabeth Fulhame (England, 1794), Tom Wedgwood (England, c.1800), Anthony Carlisle (England, 1800), Humphry Davy (England, c.1800-2), Nicéphore and Claude Niépce (France, 1814), Samuel Morse (United States, 1821), Louis Daguerre (France, 1824), Eugéne Hubert (France, c. 1828), James Wattles (United States, 1828), Hercules Florence (France/Brazil, 1832), Richard Habersham (United States, 1832), Henry Talbot (England, 1833), Philipp Hoffmeister (Germany, 1834), Freidrick Gerber (Switzerland, 1836), John Draper (United States, 1836), Vernon Heath (England, 1837), Hyppolite Bayard (France, 1837), and José Ramos Zapetti (Spain, 1837). (50)

Except for Bayard, a functionary, and Florence, a farmer, the people in this expansive list were either professional scientists or artists. Along with a geographic distribution marking the borders of Western culture this list shows that the most acute interest in photography was shared by those who exercised the two occupations that best match the "nature" of photography, scientists and artists – a  $^{38}$  Taking his clue from Eder, Batchen dismisses <u>Giphantie</u> as a dreamed fantasy.

fact that, without doubt, is now self-evident but we should be reminded that not all discoveries are been made by scientists and even fewer are engendered<sup>39</sup> by artists; it is the curious mix of both that is relevant here.

### The First Decade of Primitive Photography.

By the late 1830s rumors were circulating<sup>40</sup> that scientists from different nations were about to uncover the secret of making the images of the camera obscura permanent. Arago, informed of Daguerre's discovery, saw the potential for improving France's international standing by offering the invention to the public on behalf of the French government. In January 1839, Arago and a few of his academician friends began to lobby the government for the attribution of a life pension to the inventors of photography in exchange for the release of their secret. Finally after several reports to the Académie des sciences, to the Chambre des Députes and to the Chambre des Pairs, Arago unveiled the Daguerreotype process to a room overflowing with a distinguished and international crowd of curious, on August 19<sup>th</sup> of that year. (Gaudin 43).

From his station as a politician and a scientist Arago's announcement took a strategic importance. Arago's public intervention preempted anyone else to claim the invention for themselves, or for their country – especially the Englishman Talbot. But cutting across international political rivalries the speeches and texts surrounding the invention of photography emphasized the work of nature rather than that of a human subject.

<sup>&</sup>lt;sup>39</sup> Since, as Batchen notes, a claim of invention is a claim of paternity –and virility (35).

<sup>&</sup>lt;sup>40</sup> Or were circulated by Daguerre's allies.

In Burning with Desire Batchen notes the remarkable consistency with which photography was presented as a phenomenon of nature without the intervention of a subject. From all quarters - scientists, artists, practitioners, and critics – the language used to assert the character of the photographic process was explicit in its exclusion of the subject. For instance, Hercules Florence wrote, in 1837, that fixing the image of the camera obscura "is the way to obtain drawing made by nature and not by our hand" (cited in Batchen 45). A more circumspect early photographer the Swiss physician Gerber, who claimed to have been the first to use a solar microscope (a type of magic lantern) to take pictures insisted, in a handbook published in 1840, that "[i]mages of microscopic objects were drawn by the delicate hand of Nature herself ..." (cited in Batchen 47). The definition of photography as a work of nature not requiring the contribution of "man" proved to be a significant trope of the early discourse of photography. The two principal "discoverers" of photography, Daguerre and Talbot were especially adamant in their promotion of the autonomy of the system. Before selling his invention to the French government Daguerre tried to market it twice by subscription, once in 1838 and again in 1839. The original daguerreotypist concluded the prospectus advertising his second attempt at promoting his invention to early adopters with those words:

"In conclusion the DAGUERREOTYPE is not merely an instrument which serves to draw Nature; on the contrary it is a chemical and physical process which gives her the power to reproduced itself" (Gernsheim 1968, 81)

This translation by Helmut Gernsheim of the only remaining copy of the daguerreotype prospectus<sup>41</sup> clearly expresses Daguerre's fervent belief that the physics and chemistry of the process was enacted by nature without the help of a human subject.

Talbot, though, vaguely aware of Daguerre's research was nevertheless surprised by the publication of the daguerreotype process. Talbot introduced his own photographic method in a communication at the Royal Institute in January 1839 but without revealing the secret of his process. In 1841, Talbot patented a positive/negative system using a paper substrate; he baptized his process *calotype*. In 1845 Talbot published the first photographic album to be sold by subscription which he titled *The Pencil of Nature*. *The Pencil of Nature* was issued in 6 fascicles each including 4 salt prints for a total of 24 photographic prints on paper; each print was paired with a descriptive commentary but contained no technical information (Talbot 1969). As the title indicated Talbot, Daguerre, and many at the time considered photography to be a work of nature that didn't require human intervention for it rendered reality with an inimitable perfection. In the "Introduction and Remarks" to his series of albums Talbot warned his readers:

> [t]he plates of this work have been obtained by the mere action of Light upon sensitive paper. They have been formed or depicted by optical and chemical means alone, and without the aid of any one acquainted with the art of drawing.

<sup>&</sup>lt;sup>41</sup> Preserved in the archives of the Eastman Kodak House in Rochester, New York (Gernsheim 1968, 79)

Talbot's note of caution is an uncanny repetition of Daguerre prospectus. A few lines down, Talbot insisted that "They [the plates] are impressed by Nature's hand ...." (Talbot 1969 unpaginated).

In the *Pencil of Nature*, Talbot offered a detailed narration of his motive for inventing his "photogenic" drawing method. Talbot's story begins as follows:

One of the first days of the month of October 1833, I was amusing myself on the lovely shores of Lake Como, in Italy, taking sketches with Wollaston's Camera Lucida, or rather, I should say, attempting to take them: but with the smallest possible amount of success. For when the eye was removed from the prism –in which all looked beautiful– I found that the faithless pencil had only left traces on the paper melancholy to behold. (Talbot 1980, 28)

The Wollaston's Camera Lucida Talbot was using as a drawing aid is a glass prism mounted on a wooden rod that clips on the edge of a drawing board. When set in the proper position in front of the eye the prism projected an image of the landscape in its field of view, directly on the retina of the observer. With some practice the artist could see the projected image formed on the back of the eye superimposed on the paper covering the drawing board. When implemented properly the system allowed the observer to trace the contours of the phantom image on the reality of the canvas.

Despite its name the Wollaston's prism is not a camera at all; it may however be the most appropriate metaphor for the metaphysics of photography because it is at once a projective and an introjective apparatus. Through the simple optical ingenuity of the camera lucida the image enters the eye while at the same time it exits the eye as a simulated projection on the screen-like drawing paper. However at in the early 1800s photography is only understood as an introjective process, that is a process by which an image enters the dark chamber (whether the camera or the eye), and, in the case of photography, imprints itself on a sensitized surface. The projective function of the photographic process – that is, the projection of the observer's subjective vision in the taking of image – was only accomplished toward the end of the century. It took several decades of argumentation about the artistic merits of photography to reintroduce the vision of the subject in the photographic process. Nevertheless in an extraordinary conjecture of the thought and the unthought Talbot's narrative anticipated at once the physics and the metaphysics that inspired the invention of photography.

But Talbot's history doesn't end there, after trying to use a camera obscura with the same lack of success he experienced a *eureka* moment that he expresses in the following terms:

[h]ow charming if it were possible to cause these natural images
to imprint durably and remain fixed upon the paper!
And why should it not be possible? I asked myself.
The picture divested of the ideas which accompany it, and
considered only in its ultimate nature is but a succession and
variety of stronger lights thrown upon one part of the paper, and
of deeper shadows on another. (Talbot 1969 unpaginated)

Talbot's solution was to strip the picture of its subjective elements by "divesting" the image of the ideas it conveyed. Thus Talbot's text, rich in metaphors, affirms the excision of the subject both as an intelligent observer and as a creative agent. In Talbot's story vision did not occur in the soul as it did for Descartes, or even in the termination of the sensorial apparatus of the observer – the brain– but in front of the eye where the paper resides.

## The Epistemic Function of Photography

Kant's epistemic dualism (Stent 581) found a partial expression in the spectacles of the phantasmagoria, panorama and Diorama. In response to the change of epistemic regime at the end of the eighteenth century the Romantics attempted, with relative success, but not without paradoxes, to project the subject onto the object of nature (Recht) – "subjecting" the object of nature – while the Realists on the contrary chose to objectify the subject. Jonathan Crary asserts that Realism won; and appearances and history seems to confirm that position. However the dual epistemology Kant had theorized needed to find an expression in the social structure something that neither Romantics nor Realist literature, painting, or poetry could provide because they each had chosen one side. The hypothesis at the heart of this thesis is that photography was invented as a means to express the dual episteme of Modernity in the concrete form of a "social arrangement."<sup>42</sup>

The most significant characteristic of photography as it relates to its epistemic function is the insistence on the truthfulness and neutrality of the photographic image. Arago for instance marveled at the mathematical precision

<sup>&</sup>lt;sup>42</sup> The relationship between philosophy and modes of representation is one with deep implications in the turn from modernity to post-modernity, and the replacement of traditional photography by digital photography. The rapid adoption of digital photography across the spectrum of photographic practices could be an indication of a new shift in epistemic regime.

with which the picture of nature inscribed itself on the silver plate of the daguerreotype:

En un mot, dans la chambre noire de monsieur Daguerre, la lumière reproduit elle-même les formes et les proportions des objets extérieurs avec une précision presque mathématique; les rapports photométriques ; des diverses parties blanches, noires, grises, sont exactement conservées ... (Arago 456) In other words, in Monsieur Daguerre's camera obscura, light itself reproduces the forms and the proportions of external objects with an almost mathematical precision; the photometric ratios of the various shades of white, black, grey, are exactly preserved ... (my translation)

Foreshadowing Talbot's discourse, Arago immediately saw the potential of photography as an objective scientific instrument. Later in the same speech Arago explained the use of the Daguerreotype as a tool of photogrammetry<sup>43</sup> (Arago 492), and then as an instrument to measure of the intensity of light – photometry – which, until then, relied on subjective observations made by the physicist's eye.

In a 1839 address to the Chamber of Peers, Joseph Louis Gay-Lussac, another eminent French scientist, noted the mathematical precision of the representation offered by daguerreotypes as well: "The perspective of the landscape of every object is retraced with mathematical preciseness" adding that "not an accident, not a line, however imperceptible, escapes the eye and the pencil of this new painter" (Daguerre 35). Thus in his appreciation of the objective vision of the daguerreotype Gay-Lussac anthropomorphizes the photographic

<sup>&</sup>lt;sup>43</sup> Photogrammetry is the science of reconstructing three-dimensional space from the information obtained from a two-dimensional representation. Today, it is a technology used in satellite reconnaissance.

apparatus expressing, from the get go, the position of photography between human and machine. More than an account of the characteristics of the medium Gay-Lussac defines the "social arrangement" that sets photography apart from previous modes of representation – representation defined as the combination of image and interpretation.

The early characterization of photography as art and science expressed the inherent ambiguity of a medium whose ontological potency was intuitively recognized but not fully understood. The initial erasure of the subjective from the early practices of photography was so radical that, despite its natural predispositions, it took some forty years of arduous argumentation in defense of art photography to reinsert the subject within photography.

The argument in favor of an autonomous photographic art reached the public sphere with the publication of a series of articles by Francis Wey<sup>44</sup> in the journal *Lumiere* – the first European magazine to be dedicated to photography (Rouillé 107). But resistance was fierce; in the material world it came from trades whose livelihood was threatened by photographic reproduction, and in the intellectual space photography was still attached to its epistemic function.

In a most famous instance, the otherwise progressive Charles Baudelaire issued an impassioned argument against photography in his critique of the 1859 *Salon des Arts*. Baudelaire took the realism of photographic images as a proof that, contrary to painting, these weren't artistic pictures. However Baudelaire's diatribe wasn't without ambiguity: "Our exclusive taste for the true (so noble a

<sup>&</sup>lt;sup>44</sup> Wey was a well respected writer and art critic who became president of the *Société des gens de lettre*.

taste when limited to its proper purpose) oppresses and smothers our taste for the beautiful" (Baudelaire 85). Baudelaire's words are in perfect symmetry with those criticizing Burford's panorama of the Battle of Navarrino.

The objective realism of photography remained at the heart of the argument against the artistic value of photography for most of the nineteenth century. The early promoters of the photographic arts attempted to circumvent this argument by imitating painting. Pictorialism, a movement that surged in the 1880s, owed its aesthetic, and its relative success, to the look of the fashionable impressionist paintings. But confounding painting and photography eventually became counterproductive in the establishment of photography as a unique artistic medium. The formal characteristics of the aesthetic of the photographic image - sharpness and accuracy-turned into an asset in the 1930s with the publication of the manifesto of the Group f/64 lead by Ansel Adams and Imogene Cunningham. Photography's aesthetic was further incorporated in the modern aesthetic by the work of the famous art critic Clement Greenberg. Throughout his many reviews and articles Greenberg, possibly the most influential art critic of the twentieth century, upheld a notion of art that made the use of material unique to each practice the essence of their aesthetics. Thus for Greenberg sharpness and accuracy had to be the unique aesthetic qualities of photography.

In the interim photography found a point of entry into the legitimate art world toward the end of the nineteenth century by imitating impressionist painting. The 1889 publication of *Naturalistic Photography* by a British physician, Peter Henry Emerson was the first tentative theory of an autonomous practice of art photography. It was the beginning of the pictorialist movement

which lasted until the 1920s. For Emerson the aesthetic value of photography laid in its ability to produce images that matched human visual perception – i.e. a photograph could mimic the decrease in visual acuity that one experiences when moving from the macula or center of vision to the eye's periphery. Thus Emerson's theory replacing the hand of nature by the physiology of the eye literally reintroduced the notion of the subject in photography. The respective works of Talbot and Emerson bookend the development of photography as the epistemic device it was meant to be.

## CONCLUSION & SUMMARY

This thesis tried to demonstrate that photography was conceived as a strategy to alleviate an epistemic crisis; it began life as a means to anchor the foundation of knowledge in seemingly neutral and stable grounds. Photography was thought to be a "disinterested observer;" it was "an artificial retina" (Gernsheim 1969, 84), that dispensed with the eye of the artist like it did with the eye of the physicist, and by extension of the human subject in general. In the course of one-and-a-half century photography evolved to realize its full potential as a space for the subject and the object to negotiate their differences.

The nineteenth century initiated the end of the "grand narrative;" it split Classicism's universal history into one history for nature and one history for man (Foucault 1973, 367). Breaking up History into histories generated new philosophical and epistemological problems.<sup>45</sup> Photography stand for the materialization of the particular philosophical problems governing the episteme of

<sup>&</sup>lt;sup>45</sup> That Kantian philosophy was able to conceptualize and resolve in the abstract.
western culture from the late eighteenth century until today. Photography was invented to solve the problem of representation in the dual epistemic regime of modernity. Commentators on photography have recognized the variety of ways in which photography has been used to enable, structure and represent modern society: John Tagg analyzed the function of photography in social control and repression; Susan Sontag meditated on the effect of photographic representation in the process of understanding the world; Pierre Bourdieu studied the role of snapshots on the family structure; John Berger sought to expose photography's political dimension. Photography is the grease that reduces frictions between the subjective and objective components in the machinery of modern society.

In Modern society, where the mode of being is inseparable from the modes of production, photography creates a marketplace for the transaction of subjects and objects. This marketplace is a system of exchange of ideas and commodities symbolic of the political economy of modernity. Photography is at once a practice and a set of rules – praxis and stasis– that serves to delineate epistemic boundaries between subjectivism and objectivism, while providing the means to transgress those boundaries for a variety of purposes. Rather than being the mirror of nature or the mirror of humanity, photography is the mirror of society. Transcending the simple model of the eye it had been for centuries the camera obscura, symbol of the entire photographic apparatus, has become the metaphor of the *modern* notion of vision and visuality.

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