DIGITAL DIORAMA

by

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Submitted to the Department of Architecture on May 9, 1992
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ABSTRACT

Digital Diorama may be briefly presented as: a historical exploration of the vision devices, performances, and installations of the nineteenth century, and their influences on the project. These histories of the magic lantern, the panorama, and the diorama are investigated in relation to forming a context for creating an interactive environment with digital video on a personal computer. Critical theories of the late twentieth century are used to illustrate the change of vision from classical to modern and present a framework for understanding the potentials of digital technology

Thesis Supervisor: Paul Earls
Title: Lecturer in the Department of Architecture

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Chapter 1-Introduction

In 1822 Louis Jacques Mande Daguerre (1787-1851) and Charles Martin Bouton (1751-1853) of Paris perfected a scenic theatrical performance based on paintings and light that they called The Diorama. The audience viewed the paintings through a distant opening. By skillful lighting, live props, and sounds, the diorama simulated changes of time and location. The light passed through paintings transforming the static nature of painting into a greater illusion of reality. Daguerre and Bouton derived the word from the Greek words *dia* and *horama* that translate as *through* and *which is seen*. As society evolved with the industrial revolution the word diorama has developed along with these changes. The word now can be defined as: "an animated succession of brilliant scenes or episodes incessantly merging into one; a scale model or a life size exhibit."[1] The etymological changes of the word diorama are reflected in my project *Digital Diorama*.

The history of the diorama can be used as a method to understand the changing role of the observer and perception which is concurrent with the advent of digital image

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[1] *Webster Third International Dictionary*, 1968 ed.

technology. The diorama is a good metaphor for this because it was invented just before photography and now we stand at another threshold, before the widespread use of digital imaging. It would be easy to fall into the technological deterministic explanation[2] of how the desire for more realistic renderings led Daguerre to his invention of photography from the diorama. In this view the invention of photography, the cinema, and television can be seen as one long chain reaction linking progress with technology. The problem with this method of studying technology is that the social factors are ignored. Technology is socially constructed and art can be seen as a diorama reflecting this construct.

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[2] The best definition of the social construction of technology is by Steve Woolgar from his essay *Reconstructing Man and Machine: A Note on Sociological Critiques of Cognitivism* ,

"Distinctions between the technical (scientific) growth and the social must be broken down. Social analysis should attend to the content of technology (scientific knowledge). Technological (scientific) growth can no longer be thought of as a linear accumulation of artifacts (facts), each extrapolated from an existing corpus of technological achievement (scientific knowledge). Technology, like science, involves process as well as product. In short, both scientific facts and technological artifacts are to be understood as social constructs". in, Wiebe E Bijker, Thomas P. Hughes, and Trevor J. Pinch eds., *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology*, MIT Press 1987 p311.

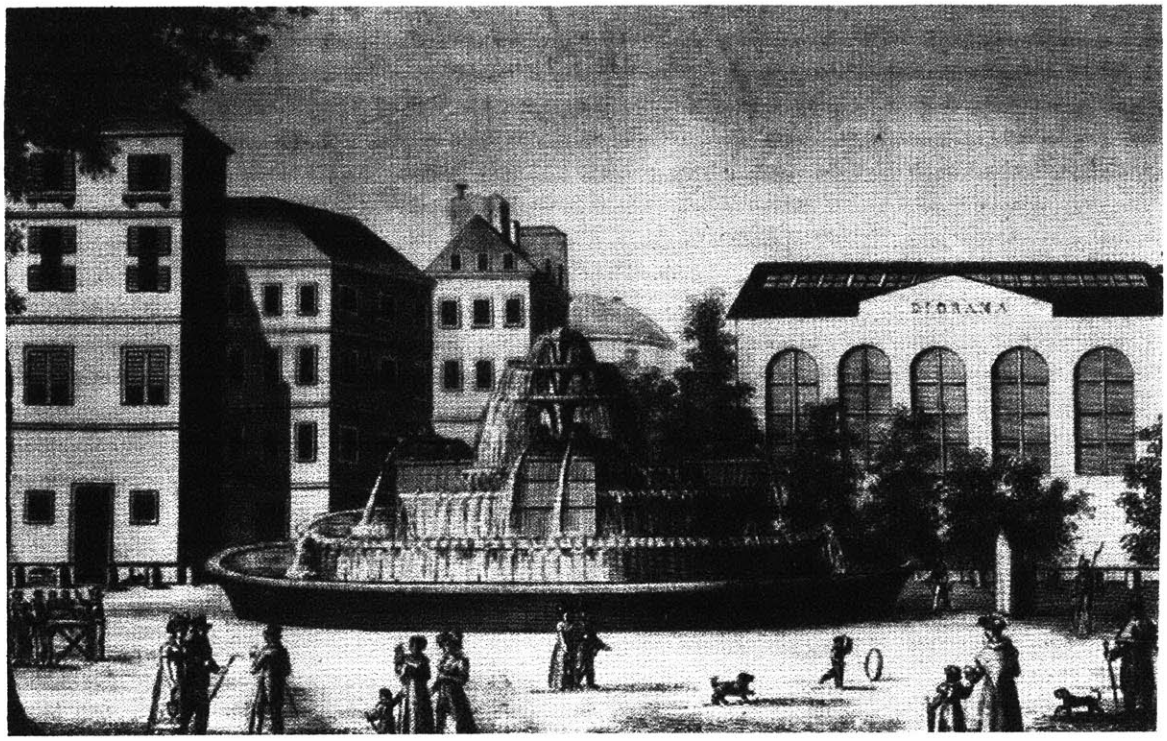

Figure 1.1 The Diorama Paris

The history of perception and the role of the observer has been explored by Jonathan Crary in his book *Techniques of the Observer.*[3] Crary bases his argument on the industrial remapping of the human body in the nineteenth century. The rise of the scientific field of physiology, the link to industrialization, and mass production and consumption of visual materials are among the many causes of the rupture of vision from the monocular concepts of the camera obscura to the binocular vision of modernism. Crary is arguing that the

[3] Jonathan Crary, Techniques *of the Observer: On Vision and Modernity in the Nineteenth Century* (Cambridge:MIT Press,1991), page 19

rise of modernism was related to the scientific discoveries of the nineteenth century which changed vision from the Renaissance perspective to the "scientific". He goes on to argue for the union of the spectacle and surveillance as a method for critical aesthetics.

Crary uses the notion of the spectacle as defined by Jean Baudrillard and Guy Debord, combined with Michel Foucault's concepts of surveillance, as a method for understanding the role of power in society. To paraphrase Baudrillard, the newly empowered middle classes of the nineteenth century procured the signs of the aristocrats by creating a system of "spectacular" consumption.[4] Their power rested in their ability to create equivalencies through mass production and consumption. The product was completely separated from the production and the consumer found a completely new meaning in the product.[5] Foucault bases his theories on Bentham's Panopticon.[6] A society based on surveillance creates control by reducing the individual to a quantitative object through autonomization. This idea is the

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[4] Guy Debord, *Society Of Spectacle*, translated by Donald Nicholson-Smith (New York: Swerve Editions 1975)section 192.

[5]Baudrillard, Jean, *The Mirror of Production*. Telos Press, St. Louis 1975 p. 9.

[6] The Panopticon was a prison designed by Jeremy Bentham in 1805. The panopticon was a round building with a glass watchtower in the middle. The cells radiated outward. The prisoners were constantly watched and no privacy was afforded. It was Bentham's belief that this constant unverifiable surveillance would reform the prisoners.

basis for Foucault's theories. Crary feels that these two models have collided with the advent of the computer's ability to manipulate images by further *"relocating vision to a plane severed from the human observer."*[7] He goes on to express political and social concern about the global exchange and control of electronic information.

Crary combines the arguments of Foucault, Baudrillard, and Debord to illustrate the concept of the union of spectacle and surveillance. This union is the basis of my *Digital Diorama*. The concept of 'spectacle' defined by Guy Debord is a cultural critique of late capitalism through art. The term originates in the late 1950's accredited to the Situationist International[8]. Guy Debord's definition of the role of spectacle:

> "Since the spectacle's job is to cause a world that is no longer directly perceptible to be seen via different specialized meditations, it is inevitable that it should elevate the human sense of sight to the special place once occupied by touch; the most abstract of the senses, and the most easily deceived, sight is naturally the most readily adaptable to present-day society's generalized abstraction"[9]

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[7]Crary, p 24.

[8]The Situationist International was a group of European Artists who in the late 1950s separated themselves from the "avant-garde" to launch a strategy of art as cultural critique. Guy Debord was one the main shakers. See *On a Passage of a Few People Through a Rather Brief Moment in Time: The Situationist International, 1957-1972*(Cambridge: MIT Press 1989).

[9]Debord, section 18.

Debord argues that spectacle is created through the use of mass-media. Through the use of a multitude of media a homogenized image is generated without any tangible surfaces. The ethereal nature of these images creates a framework for control of information which controls the politics.

Foucault argues against the concept of spectacle, or mass-media, having any role in the formation of power. He believes the role of power is based on surveillance. He attacks the description of our society as one of spectacle: "Our society is not one of spectacle but of surveillance...We are neither in the amphitheater nor on the stage but in the Panoptic Machine"[10] Foucault believes that the partitioning of the new classes (the rise of the bourgeois class) created a society of surveillance. This society arose from practices of scientific management and the science of physiology which led to the compartmentalization of human behavior.

I see *Digital Diorama* as representative of both spectacle and surveillance. The viewer loses the plane of reference and tangible aspects of vision through the spectacle of the diorama. By the nature of Digital Interactive Video (DVI) the viewer is participating in an act of surveillance. I have created a new Diorama based on the

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[10]Michel Foucault, *Discipline and Punishment: The* Birth of the Prison. trans. Alan Sheridan, Pantheon 1979 p 217.

etymological changes of the word, as noted before. I have chosen a public issue that affects the community, which I feel is representative of the post-industrial age in physical and philosophical terms. I have made a documentary entitled *Pollution, Waste, and Recycling in Cambridge* that is the framework for *Digital Diorama*. In the installation the viewers participate as live models in the set.

Chapter 2-Projections

> "Plateau in the concoction of what we may call cast and scenario for his Fantascope chose the same star as did Athanasius Kircher, the Jesuit inventor of the magic lantern two hundred years before-namely the Devil. How the Devil does persist in motion pictures! Plateau's Fantascope showed "Le Diable Soufflant"-The Devil Blowing up Fire. Kircher's painted lantern slides could only show a portrait of the Devil, but Plateau's Devil was in action. *Even Hell is improved in science.*" (my emphasis)[11]

In this chapter the history of projection devices will be explored from the standpoint of *Digital Diorama*. The history of these devices and performances seem to be neglected in the study of art and technology. Today's art and technology echo similar concerns and responses. The cries of necromancy of Giovanni Battista della Porta and Athanasius Kircher's magic lantern shows of the seventeenth and eighteenth century are similar to those heard today when people react to the use of technology and science in art. The interactive qualities of Etienne Gaspard Robert's Phantasmagorias, the loss of perspective in the family of panoramas, and the personal vision of the Phenakistiscopes and the Zoetropes have influenced my project.

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[11]Terry Ramsaye: *A Million and One Nights: A History of the Motion Picture* (New York:Simon and Schuster, 1926) p.14.

In 1589 Giovanni Battista della Porta's book *Magica Naturalis, sive de Miraculius Rerum Naturalium*, (Natural Magic or the Wonders of Natural Things) was published in Rome. He is credited with being the first in the West to describe the camera obscura. In Martin Quiegly's book, *Magic Shadows: The Story of the Origin of Motion Pictures* he quotes from della Porta's book the description of the camera obscura. Quiegly describes how della Porter created an artificial environment using this device,

> "If any one wishes to see this effect, all the windows should be closed, and it would be helpful if the cracks were sealed so that no light may enter to ruin the show. Then in one window make a small opening in the form of a cone with the sun at the base and facing the room. Whiten the walls of the room or cover them with white linen or paper. In this way you will see all things outside lighted by the sun, as those walking in the streets, as if their feet were upwards, the right and left of objects will be reversed and all things will seem interchanged. And the further the screen is from the opening proportionately the larger the objects will appear; the closer the paper screen or tablet is drawn to the hole, the smaller the objects will appear." [12]

Quiegly goes on to explain what della Porta did to create an "indistinguishable illusion." Della Porta recommended the use of miniature models of animals and natural scenes, the first stage sets for "motion pictures" with puppet like characters. He wrote, "Those present in the

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[12]Martin Quiely, Magic Shadows: The Story of the Origin of Motion Pictures(Washington: Georgetown University Press, 1948) p 54.

show room will behold the trees, hunters and other objects without knowing whether they are true or only illusions"[13] What makes della Porta interesting is not his detailed account of the camera obscura, but how he incorporated live elements with artificial ones. Della Porta created a stage for objects that was placed closer to the pinhole on the outside of the camera obscura enabling a mixture of live and artificial elements to be projected. Della Porta had by the end of the sixteenth century begun to sever the tactile sense from vision by combining the camera obscura's darkened images of the outside world with the artificial worlds of his own creation.

Figure 2.1 della Porta's *Natural Magick*

[13]Quiegly, p. 41.

In 1671 the German Jesuit Father Athanasius Kircher expanded Porter's writings to include one of the first descriptions of the magic lantern and its uses as a projection device. He chronicles the uses of magic lanterns for projecting figurative and scientific images. One of the more interesting devices from Kircher's descriptions is the Catoptric (mirror) Theater. Kircher's theater was constructed with magic mirrors. These convex mirrors had etched on them drawings of objects and secret messages similar to the lanterns. The surface of the mirrors were polished until the lines of drawings were barely visible. When light was shown into the mirrors and focused to the focal length of the convex mirrors the drawings and messages appeared on the wall. Kircher concealed the mirrors in a room or a box. A series of his magic mirrors would project images into this space, creating the theater. An environment that was based on the solely visual senses was created.

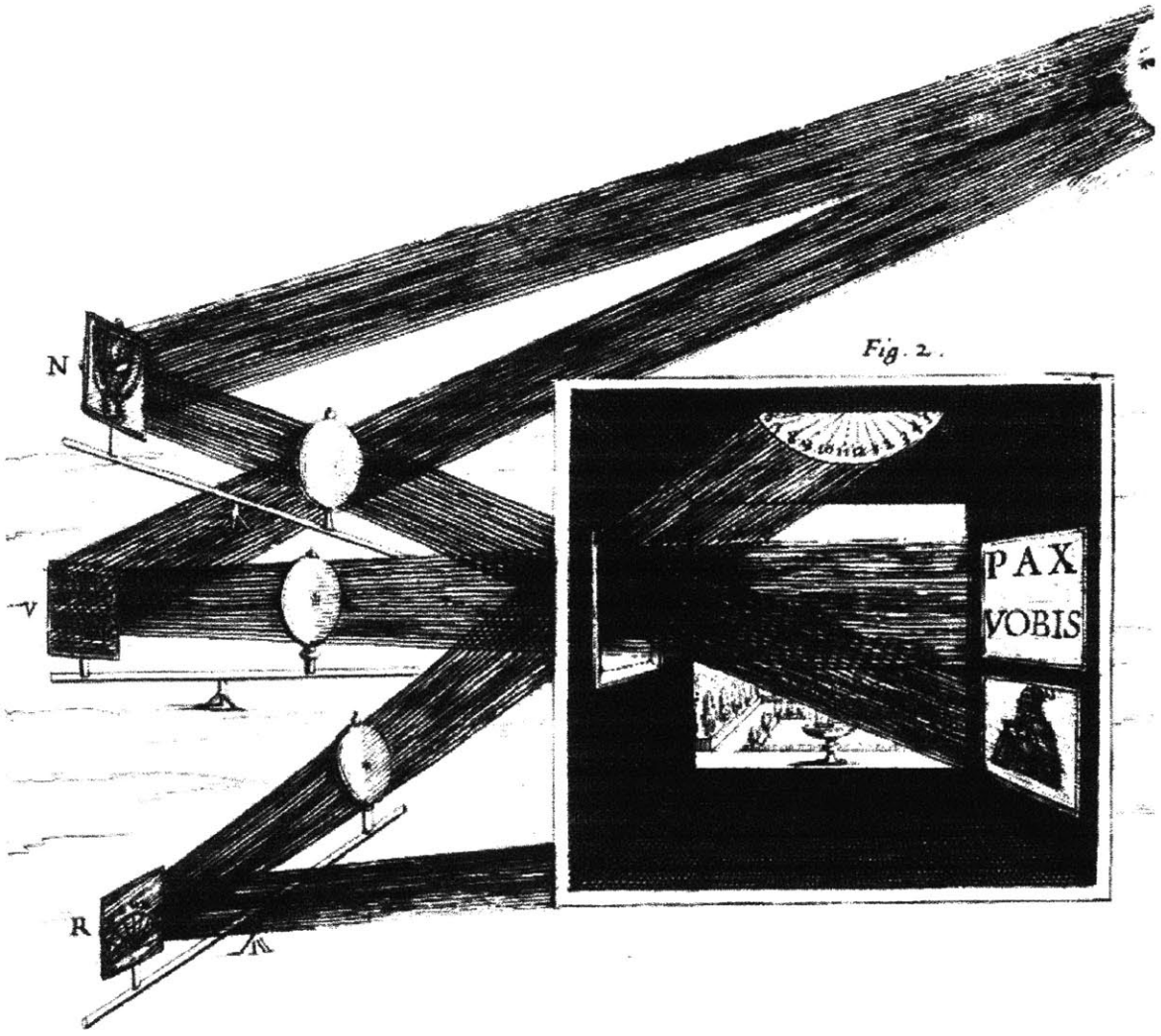

Figure 2.2 Kircher's Catoptric Theater

Kircher's invention is accredited in the long history of cinematography as a precursor to motion pictures. Kircher invented a device for viewing a succession of images that Franz Paul Liesegang describes in his book *Date and Sources*

> "Kircher concludes the section on the magic lantern with an account and illustration of a revolving picture disc which is viewed through an eye-piece like a peepshow. It is not strictly speaking a projection device at all ... The pictures, which represent the Passion of Christ, are painted on a glass disc which is enclosed in a shallow drum with an eye-piece on one side opposite the aperture. The glass disc is then revolved with the instrument against the light and a succession of scenes are presented to the eye through the eyepiece."[14]

Kircher's realization that a narrative could be created through a succession of images without a performance is one of the early breaks from classical vision and thought. This performance was dependent on an instrument between the eye and the image. Both Kircher's Catoptric Theater and the motion projection device are excellent examples of technology creating an artificial environment by mediating between the observer and vision.

In terms of the interactive spectacle and the history of vision instruments one can not leave out the inventor of the Phantasmagoria, Etienne Gaspard Robert (Robertson) who, in 1798, opened the improved Phantasmagoria in Paris at a disused Capucine Chapel. Robertson was a real showman; using rear projection screens and moving lanterns he created a

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[14]Franz Paul Liesegang, *Dates and Sources: A Contribution to the History of the Art of Projection and to Cinematography*, trans. Hermann Hecht(London: The Magic Lantern Society of Great Britain, 1986)p 10.

horror show. Robertson called them Seances and the audience would suggest who from the other world (famous deceased only) they would like to see and Robertson would produce their image from the grave.

Figure 2.3 Robertson's Phantasmagoria

The image would grow and shrink as it changed from a skeleton to the chosen celebrity. This was achieved by a vast inventory of slides and trick effects of moving the

projectors. Barnes explains, from the *Catalogue of the Collection*,

> "The lantern was placed on a movable carriage, and on moving it nearer or farther from the screen, the images were made to decrease or increase in size. The audience seated on the other side of the semi-transparent screen were thus under the impression that the images were advancing towards them or retiring in the distance. By this means, a wide variety of weird and ghostly effects were devised . . . The audience was completely shut off from the operating area by a white cloth or screen about 10 to 12 feet square, which had been soaked in a bath of pure wax and then ironed out to the required transparency. It was hidden from view by black curtains which were only withdrawn when the light in the auditorium was extinguished. The slides were prepared with black opaque surrounds so that only the images were visible, thus eliminating the normal circle of white light which would otherwise occur. By this means, the audience was never aware of the existence of the screen and the pictures took on the aspect of aerial images."[15]

Similar to della Porta, Robertson broke the conventions of the specific device. Robertson freed the projector from its fixed point in relation to the screen. By doing this he was able to bring a spontaneity and a change in scale to his performances. The mechanical operations were hidden from view. Robertson created a different kind of artificial environment. It was specific to the location and presented a performance that the audience interacted with.

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[15] John Barnes, "Precursors to the Cinema," in Catalogue of the Collection(St. Ives Corwall: Barnes Museum of Cinematography, 1967) p. 29.

Figure 2.4 Robertson Performing

In 1832, simultaneously in Brussels and Vienna, a device was invented, which had to do with the persistence of vision, and the standardization of visual imagery of the nineteenth century. It was an instrument which presented a moving image or an animation from a series of images that worked on the principle described by Liesegang:

> "The physicist Joseph Plateau in Brussels and Simon Stampfer, Professor of Geometry in Vienna, following up Faraday's experiments, arrived at the invention of identical forms of Phenakistoscopes independently of one another (towards the end of 1832) The instrument consists of a revolving cardboard disc which has a ring of pictures, and slots through which one views the pictures in a mirror."[16]

The literal definition of phenakistoscope is *deceptive view*. By spinning the discs, the pictures became animated if one looked through the slits while the images were reflected in a mirror. Plateau called his device the Fantascope and Stampher named his device the Stroboscope, but the cheap imitation that was mass produced was called the Phenakistoscope. Unlike the previous devices and performances the Phenakistoscope was commercially manufactured and owned by the public of the nineteenth century enabling a personal experience of "moving pictures".

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[16]Liesegang, p. 24.

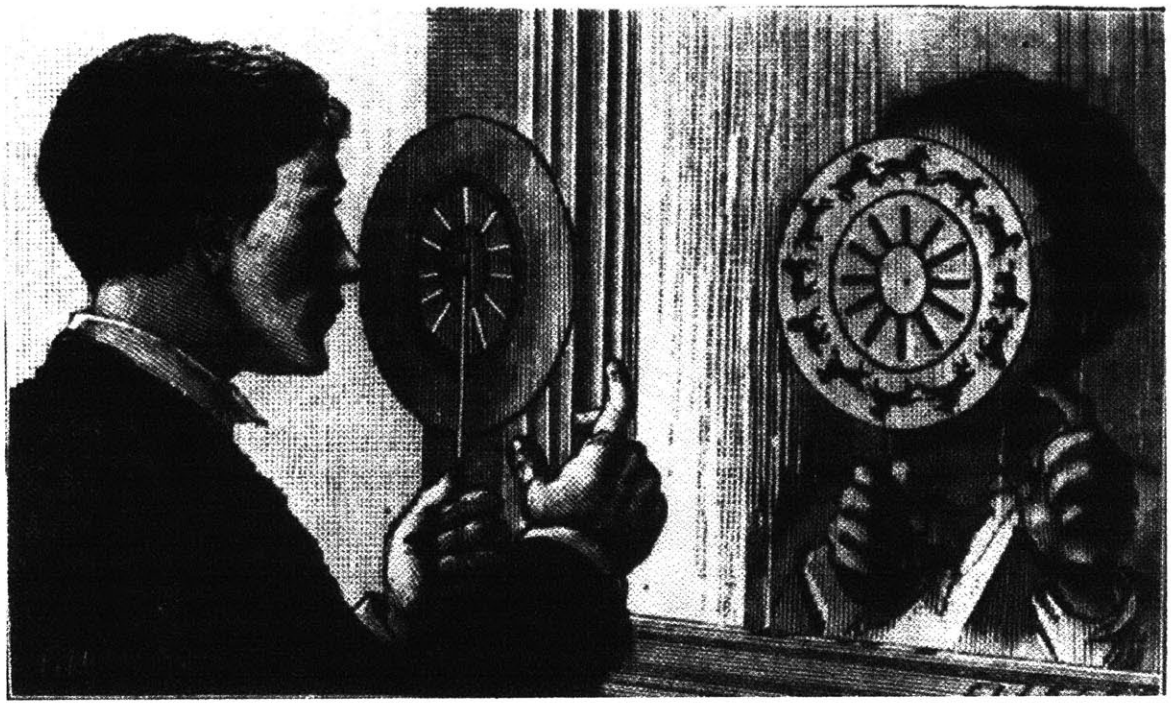

Figure 2.5 Phenakistocsope

A similar machine based on the Phenakistiscopes, the Zoetrope[17] invented by the Englishman W.G. Horner in 1833 and subsequently improved by a series of inventors like all the devices mentioned previously. One of the more interesting sections of the history of these devices is the improvements that Baron von Uchatius of Austria made to the phenakistoscope. On the suggestion of Colonel von Hauslab, Uchatius developed a system to project images by rotating the light source. He perfected the system in 1853 and the

[17] A zoetrope is a hollow cylinder with slits cut into the sides. The images were on the inside of the cylinder. In the center of cylinder was round mirror. The cylinder with the slits and a series of images would spin. The viewer would look into the slits as the cylinder spun by and the images would appear animated in the mirror.

Viennese optician Prokesch undertook commercial production. Uchatius' intention was to create a device for military training through the use of moving visual images.

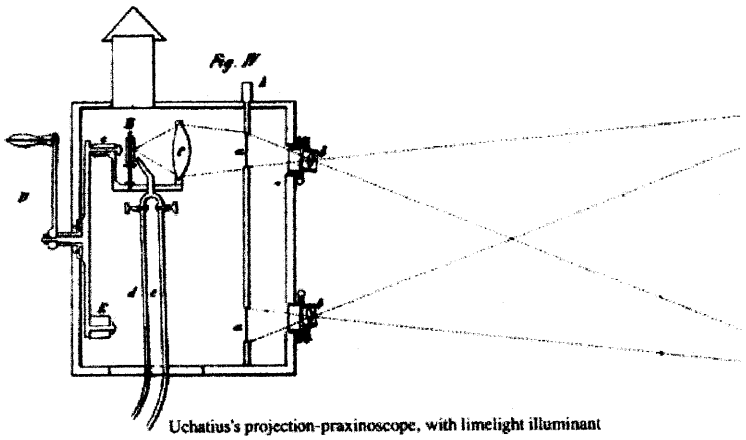

Figure 2.6 Uchaitus Projection Device

Chapter 3: The Panorama

The panorama created space where an artificial milieu was achieved. One of the reasons panoramas were different than the phantasmagorias was that a special building had to be designed and constructed. They differed from Kircher's Catoptric Theater by not relying on localized Renaissance perspective. The viewer was free to move through the space in an interactive sense. The panorama gave the viewer the ability to witness battle views and travel to foreign cities. If one looks at the building one cannot mistake the similarity to Bentham's Panopticon. Foucault describes best the role that the Panopticon has played in the formation of modern society,

> "the Panopticon must not be understood as a dream building: it is the diagram of a mechanism of power reduced to its ideal form; its functioning, abstracted from any obstacle, resistance or friction, must be represented as a pure architectural and optical system: it is in fact a figure of political technology that may and must be detached from any specific use."[18]

The panorama was the 'spectacular' experience of the panopticon turned inside out.

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[18]Michel Foucault, *Discipline and Punishment: The* Birth of the Prison. trans. Alan Sheridan, Pantheon 1979 p 204.

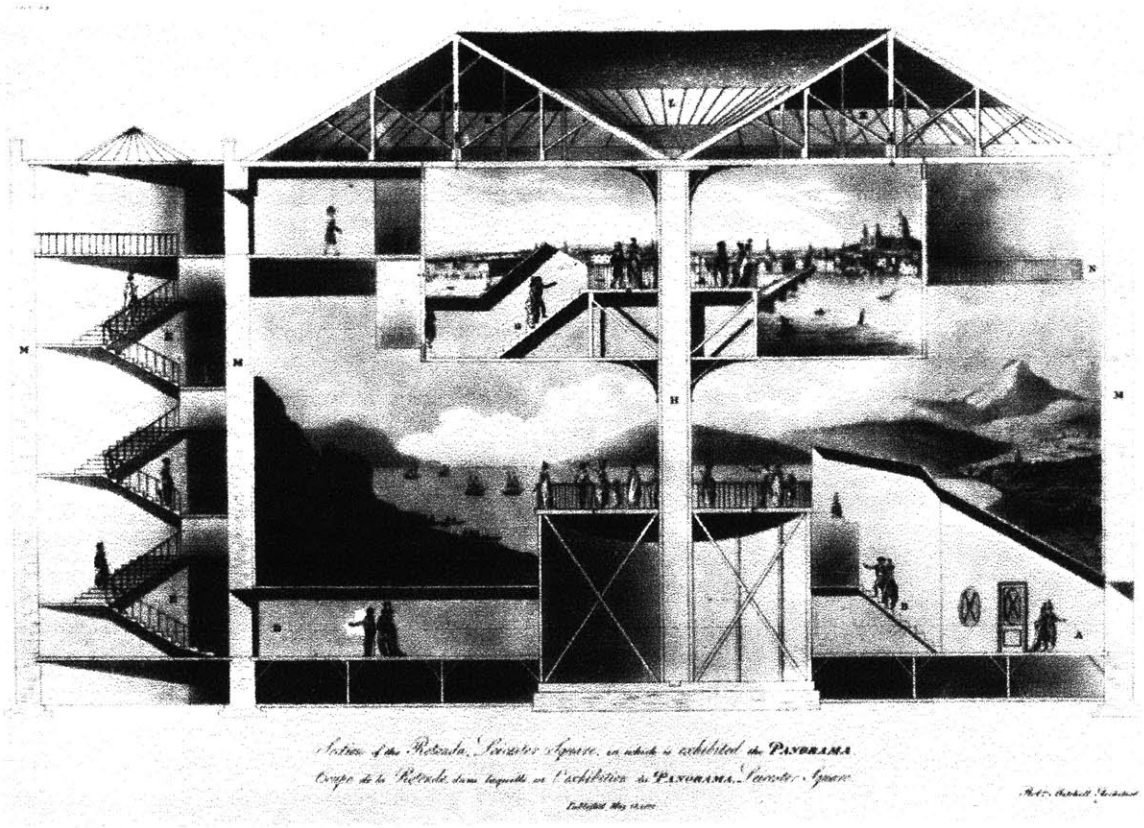

Figure 3.1 Barker's Panorama

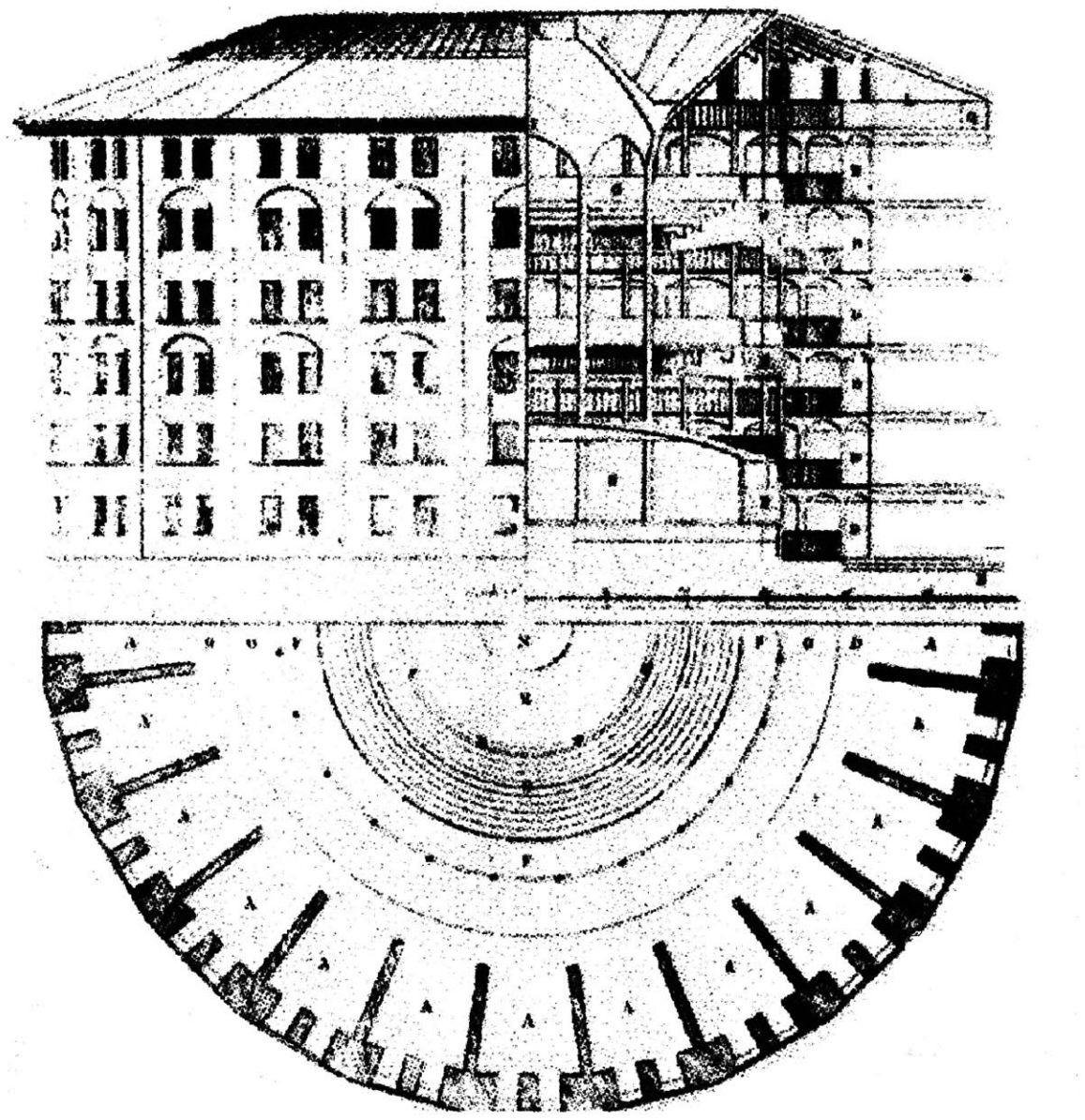

Figure 3.2 Bentham's Panopticon

The Panorama is important because, unlike the projection devices which transported the viewers optically, it transported them spatially as well. The Panorama was patented

in 1787 by Robert Barker (1739-1806). A point made by Melman is the role of the observer as participant:

> "But to reach it he had to go through a dark labyrinth of passages and stairs which made him lose all sense of space and distance. In this way he forgot he was in a round building, massive as a watchtower, in the fortress of the collective imagination. Suddenly space opened out and the spectator found himself on a circular platform, lighted from above. His eye then took in a continuous view of a landscape painted on the distant horizon. Having lost the sense of reality, with no material frame of reference to guide him, he felt himself engulfed in infinite space. Each spectator had the impression of being the center of this artificial world which he dominated from his high point of observation. While belonging to it, he was isolated from it, standing in apparent solitude and perfect security. By means of this panorama mounted on a cylindrical surface, he could visit distant cities and witness battles and sea fights. Standing on the fuzzy borderline separating the true from the sham, he himself played an ambiguous part somewhere between a spectator and an actor."[19]

The panorama erased the lines of localized Renaissance perceptive. There was no frame denoting the end of the painting. Viewers were able to wander leisurely and safely through the landscape. As Jonathan Crary points out "The circular or semicircular panorama painting clearly broke with the localized view of perspective painting or the camera obscura, allowing the spectator an ambulatory ubiquity".[20]

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[19]Miriam Milman, *Trompe-L'Oeil:Painted Architecture,* (New York: Rizzoli,1986) p93.

[20]Crary, p. 112.

What made the Panorama remain closer to the Renaissance world was the fact that it was not a machine.

In 1837 around the time of the Phenakistoscope's rise, Paper Panoramas were being published for home use. The increase in availability of printed visual images enabled a dispersion of subjects previously not obtainable by the masses. This is a good precedent to Baudrillard's notion of spectacular consumption during the nineteenth century. Paper panoramas subjects' ranged from royal processions, topographical vistas, and reproductions of the large rotundas. Barnes explains in his catalogue that printers were "producing a paper counterpart which could be enjoyed in the home."[21]

By the end of the century the panorama had been displaced by other forms of entertainment, such as dioramas and projection praxiscopes[22], etc. Inventors combined the ideas of the panorama and the projection devices and began to include photographic images. In 1894 in America, Charles A. Chase exhibited the Stereopticon Cyclorama where he used eight double lantern projectors. The projection apparatus rested in a chandelier style platform. By using double

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[21] Barnes, p. 28.

[22] A praxiscope is similar to a Zoetrope and the Phenakistascope

lanterns Chase was able to dissolve to different scenes or create effects of moonlight, moving clouds, or changes of light. Four years later in 1898 T.W. Barber and C.W. Locke created the Electrorama with a circumference of 400 feet and a height of 40 feet using a different system of projection. Their system consisted of a ten lens circular projector. A platform was fixed halfway between the top and the bottom of the cyclorama for the audience of hundreds. In 1900 the brothers Lumiere created the Photorama based on a continuos panoramic slide projected in segments at a speed unnoticeable to the human eye. Let Barnes explain:

> "The brothers Lumiere in Lyons constructed a novel apparatus for panorama-projection ('Photorama'): a film-strip, a transparency of a panorama photograph, 90cm in length and 11cm high, forms a cylinder with a diameter of 29cm. Twelve objectives combined with mirrors rotate around this and project a section of the picture in turn on the wall at a speed (three rotations per second) which gives the impression of a continuous panorama. The light source is a 90 amp carbon-arc lamp strengthened by condensers and reflectors."[23]

These improvements are a prevalent pattern in the history of these devices. The combination of the panorama and the projection apparatus is part of development that interests me with *Digital Diorama*. The technology was applied to create an improved artificial environment.

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[23]Liesegang, p 73.

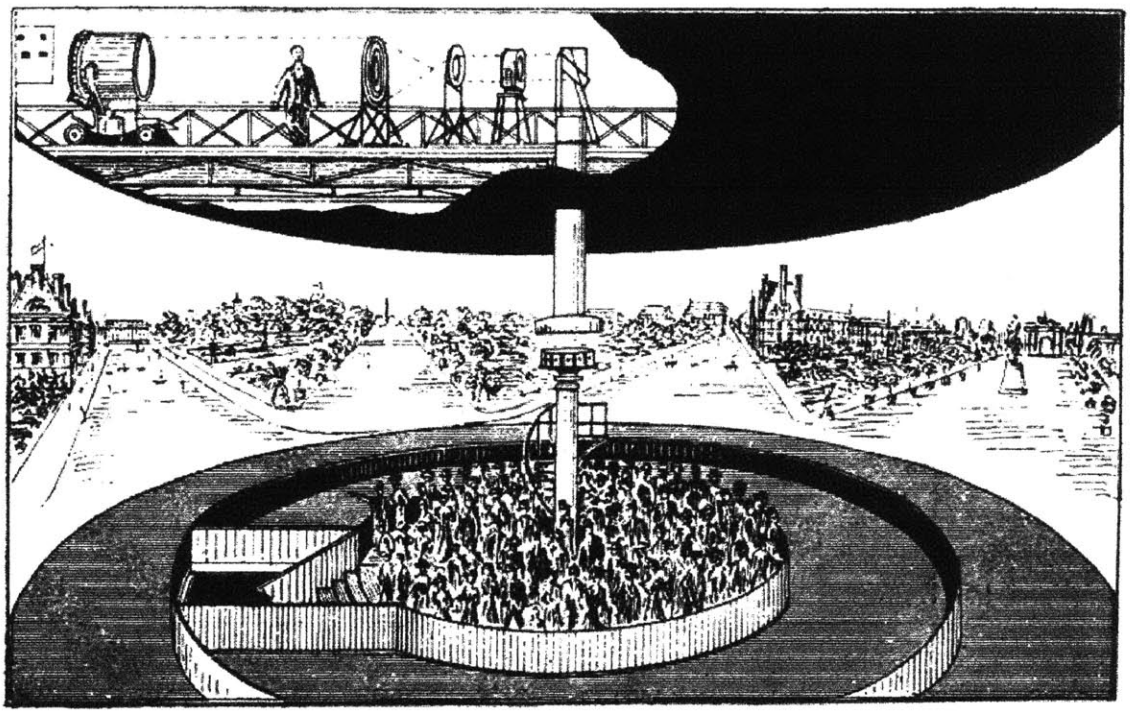
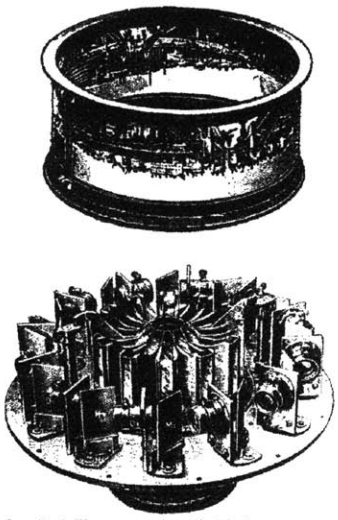


Figure 3.3 Lumiere Photorama



Lumière's Photorama : the cylindrical panorama photograph and the twelve lens and mirrors

Figure 3.4 Detail the projection system of the Photorama

Chapter 4- Diorama

The diorama creates multiple artificial environments. The experience is of one mechanical illusion. The idea of manufacturing a mechanical experience to replace the natural is not one generated by the hindsight of the historian, but one that is clearly stated by Daguerre, "My only aim was to effect illusion at its greatest height; I wanted to rob nature and therefore I had to become a thief"[24]. Daguerre may have expressed himself in an artistic fashion but he was also a savvy businessman who kept the workings of the Diorama a secret until the building burnt down in 1839. He manufactured a spectacle that transported people to foreign cities, recent catastrophes, and through time to such places as the Temple of Solomon.

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[24]Janet Berger *The French Daguerreotype*(Rochester: Eastman House, 1986) p 17.

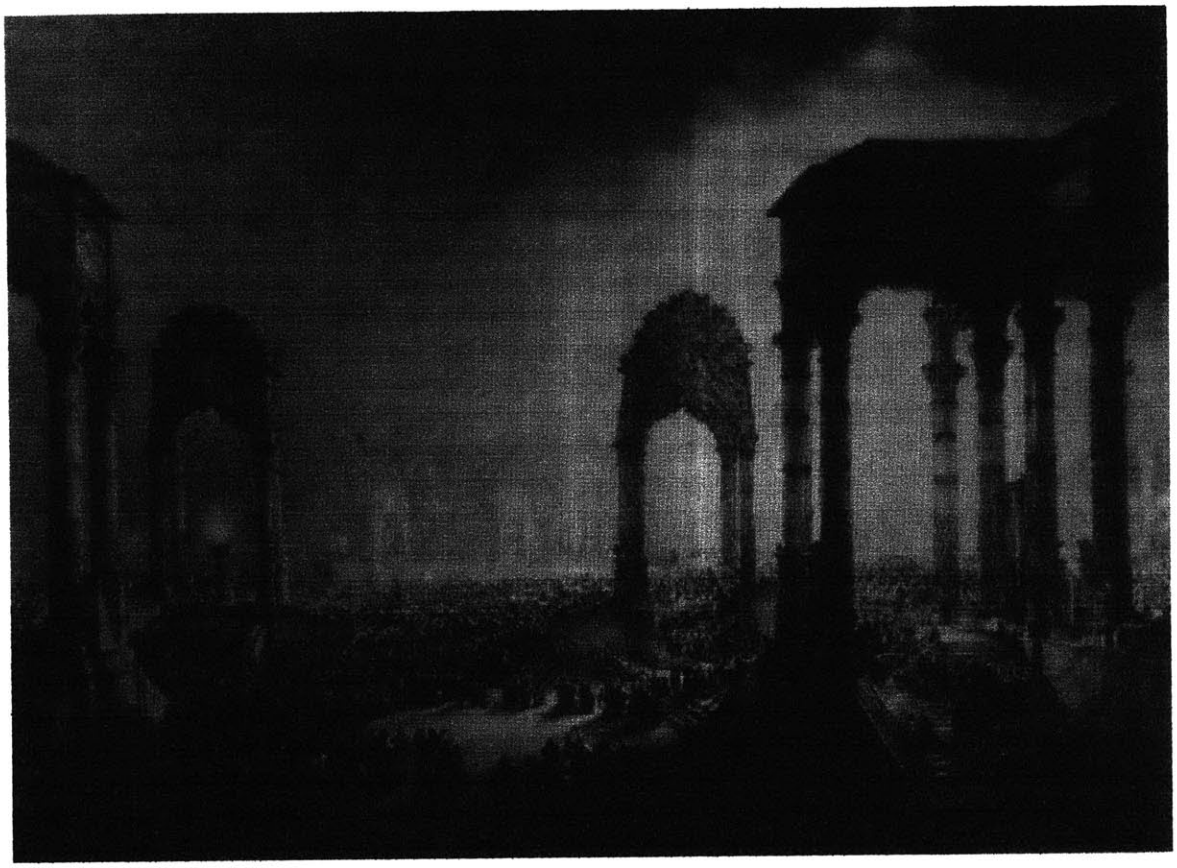

Figure 4.1 Daguerre's *Temple of Solomon* 1822

In 1822 Louis Mande Jacques Daguerre and Charles Marie Bouton opened the Diorama in Paris. Both he and Bouton had worked at Pierre Prevost's (1764-1823) studio on paintings for the Panorama in the decade before. After Daguerre left Prevost's studio he designed the scenery for the Theatre Ambigu-Comique and the Opera where he became renowned as a scenic designer. Daguerre and Bouton were not new to the demands presented by the panorama. In a sense it was a union of the theater and the panorama that probably enticed Daguerre and Bouton to create the Diorama. Also in Paris at

this time was the Diaphanorama invented by Niklaus Konig (1765-1832) of Berne. Helmut Gershiem in his book *L.J.M. Daguerre* describes Konig's process;

> "The pictures, painted in water-color on paper were shown in a darkened room by transmitted and reflected light, various degrees of transparency being achieved by oiling and partly scraping away the back of the paper....the Diaphanorama remained on public exhibition in Paris until the end of 1821."[25]

The Diaphanorama paintings measured about 22 by 25 centimeters. Daguerre and Bouton must have been aware of the Diaphanorama and been inspired to improve the effect. As Gernsheim suggests with quote from the patent "an improved mode"[26] . What is different is the apparatus, the environment and the fact that the viewer became a component.

After you walked through the vestibule of the Diorama and bought your ticket (3 francs for the boxes or 2 francs for the amphitheater) you entered the auditorium. The theater was decorated with painted drapes and shields on which famous artists' names appeared. What made this auditorium different is the fact it was round and at the front was an opening similar to a stage proscenium. The auditorium held about 350 people. The box seats, which cost more, held about 50

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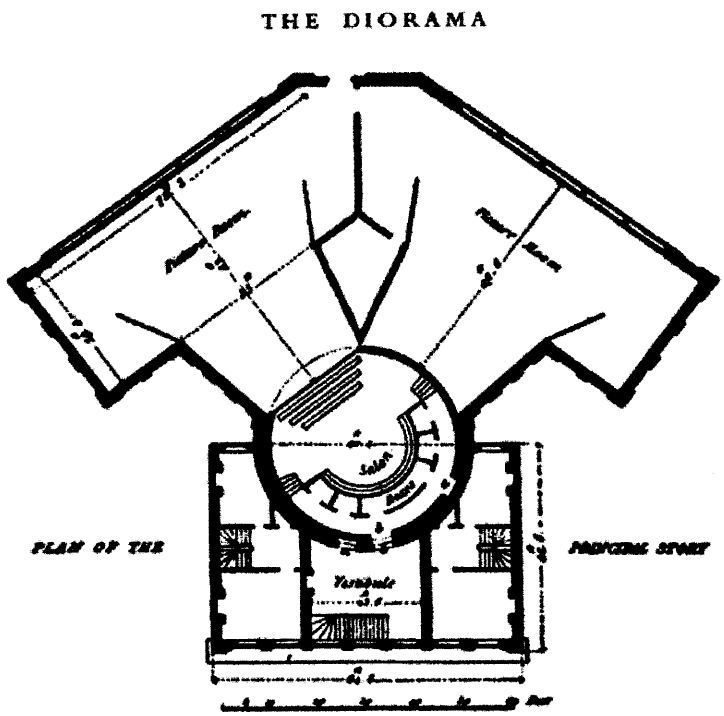
[25] Alison and Helmut Gernshiem, L.J.M. Daguerre: The History of the Diorama and Daguerreotype(New York: Dover Press, 1968) p 14.

[26] Gernshiem, p. 15.

patrons. The show lasted about one half a hour and people were welcome to sit through a second show.

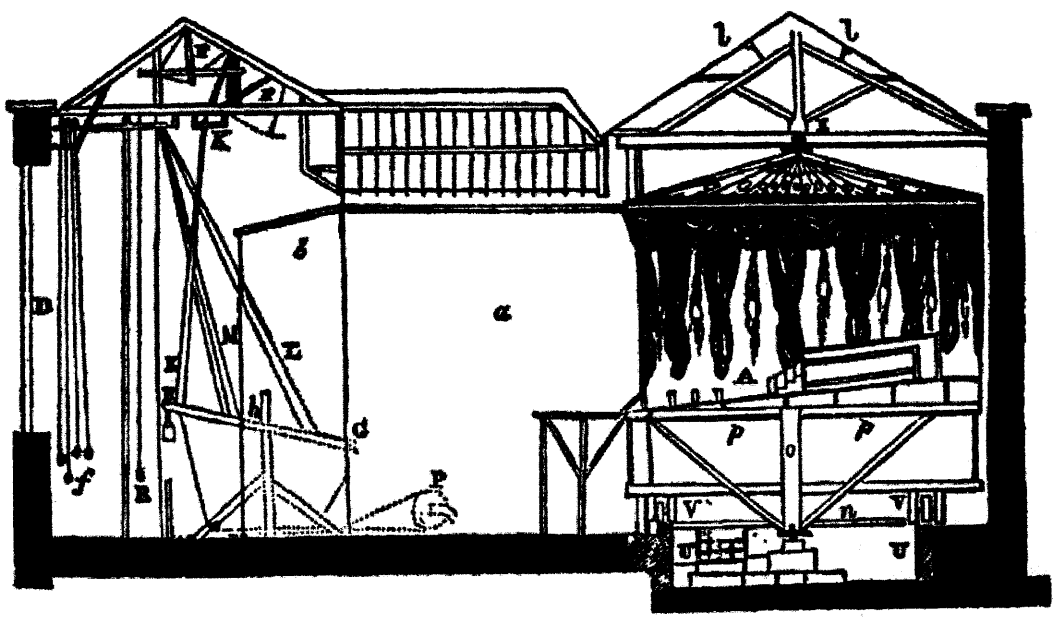


(*a*) Ground plan of the Diorama building, London, by A. Pugin and J. Morgan, 1823

Figure 4.2 Diorama

What made the Diorama unique is that it had a round auditorium of 12 meters in diameter and 7 meters high rotated 73 degrees to change views from one painting to another every 15 minutes. Each painting was viewed through a long tunnel about 13 meters back from the opening. The paintings were 22 meters by 14 meters high and met at their respective inner sides at an obtuse angle. There were sky lights above the

painting and windows behind with frosted glass. Light was controlled by screens and flags from behind and above the paintings. The majority of effects achieved by the Diorama were created by large colored (flags) screens that passed in between the back windows and the paintings. These screens controlled the passage of light creating the changes that stimulated such effects as day to night, the passing of a storm or lifting of a fog, or a natural disaster, such as an avalanche.



THE DIORAMA.

(*b*) Cross-section of the auditorium and picture emplacement of the Diorama, London

Figure 4.3 Diorama

The Diorama was a huge success and the Press of the time gobbled it up, as Gernsheim's chronicles. Here is a review of

the first show in London, by the London Times in December 8, 1822:

> "While gazing in rapt admiration at the architectural beauties of the cathedral, the spectator's attention was disturbed by sounds underground. He became conscious that the scene before him was slowly moving away, and he obtained a glimpse of another and very different prospect, which gradually advanced, until it was completely developed, and the cathedral had disappeared. What he now saw was a valley surrounded by high mountains capped with snow. . .The most striking effect is the change of light. From a calm, soft, delicious, serene day in summer, the horizon gradually changes, becoming more and more overcast, until a darkness, not the effect of night, but evidently of a approaching storm"[27]

This is a description of the Diorama's first exhibit in London which consisted of the *Valley of the Sarnen* by Daguerre and *The Chapel of the Trinity in Canterbury* by Bouton.

By the late 1860s the dioramas had faded out of existence. Daguerre's diorama in Paris had burnt down in 1839, never to be rebuilt. Daguerre had found a new interest with photography. The word diorama seemed to have picked up some new meanings due to other events. In the late 1830s publishers such as Reeves and Sons and Cheapside of England had published home Dioramas. The pictures measured around 6 inches by 7 inches not counting the cardboard diorama. These

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[27]Gernshiem, p. 17.

paper transparencies were viewed by reflected and transmitted light. Around the same time shows based on Philip de Loutherbourgh's (1740-1812) Eidophysicon became popular again. On a small stage, roughly 6 by 8 feet, models of battle scenes and catastrophes were acted out with fantastic special effects such as sounds, lights, and pyrotechnics. In 1830 in Covent Garden David Robert's Panorama/Diorama, an exhibition was mounted entitled *His Majesty Helca and Furys Polar Exhibition*. The paintings were reportedly rolled out from a giant scroll to simulate the voyage of the ships. In 1832 the Pleorama was introduced by Carl Wilhelm Gropius(1793-1870) in Breslau. The auditorium in the Diorama of Breslau was changed into a form of a small ship that took aa hour long voyage in the Gulf of Naples or down the Rhine from Mainz to St. Goar. Movement was achieved by rolling the paintings by the viewing salon creating a transversing view point that gave an illusion of travel down the waterways.

The difference between the Diorama and the Panorama and some of the early projection devices is that it was a machine. Vision was severed from the human hand, and illusion was created. Crary makes this distinction,

> "The multimedia diorama removed that autonomy from the observer, often situating the audience on a circular platform that was slowly moved, permitting views of different scenes and shifting light effects. Like the Phenakistoscopes or the Zoetrope, the diorama was a machine of wheels in motion, one in which the observer was a component."[28]

Making the observer a component in the machine corresponds to the rupture of the classical vision of the camera observer to the modern vision. This signifies the union of observer and the apparatus and the acknowledgment that the sense of vision is linked to the brain.

If we go back to more recent meanings of the word diorama we can see the etymological changes that have taken place The word (Webster 3rd International) now can be defined as: an animated succession of brilliant scenes or episodes incessantly merging into one, a scale model or a life size exhibit. We now can see the development of the word up to the twentieth century. But what still interests me is the concept of theater of landscape. Even in the more narrative adventures of catastrophes, battles, or voyages the landscape is still the dominant character.

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[28] Crary, p 112.

Chapter 5-Georges Melies

Georges Melies was born in Paris, December 8, 1861. He is generally considered the inventor of narrative film and the inventor of the genre of the Fantastic Theater. He was a conjurer, magician, and owner of the Robert-Houdin Theater in Paris. After viewing the Lumiere's brothers first demonstration of their motion picture device on 1895, Melies became fascinated with idea of translating his style of performance to the new medium of film.

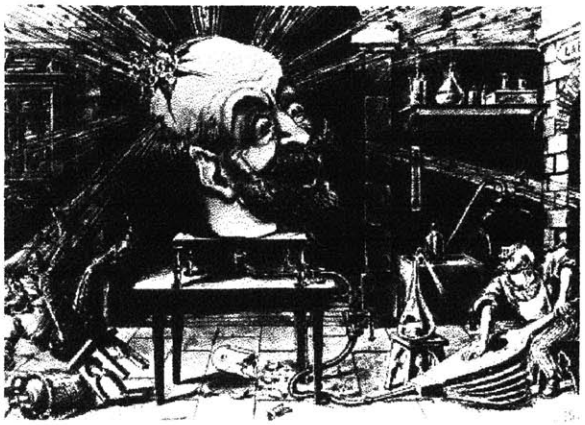

Figure 5.1 The Man with the Rubber Head (1902). A drawing by Melies of his head exploding

Melies combined the performances and techniques of the projection devices with the environments of the panoramas and the trickery of the diorama. He is one of the first film makers to create a personalized vision with the medium. The films he created were referential to the medium of film and

took advantage of inherent qualities of recording a three dimensional space into a moving two dimensional projection.

This individual vision vanished as the Edison empire standardized the nascent film industry. Melies vision remains unique almost ninety years later. As Paul Hammonds notes in his book *The Marvelous Melies*;

> "Melies thought of his films as connected fragments, and he compared his role to the compere of a revue who "is there to link the acts that have nothing to do with each other." The spectacular irruption of cathartic imagery within a central narrative is central to Melies aesthetic. His films make the viewer aware of the validity of the heightened, autonomous image. The independence of the isolated image and its ability to shock and astound has implications for any critical conception of the cinema."[29]

Melies has taken the nineteenth century histories in the changes of vision, perception and the observer and consigned them to a single film strip. Melies style of working is the basis for modern film making: multiple exposures, primitive optical printing, razor blade editing, and camera movement. His work contains the histories of the past century with the allure of magicians and conjurers, and performers. He has become the Devil; I wonder how Mr. Ramsaye would feel about Melies ability *to improve science*.

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[29]Paul Hammond, *Marvelous Meleis* (New York: St. Martins, 1974) p 8.

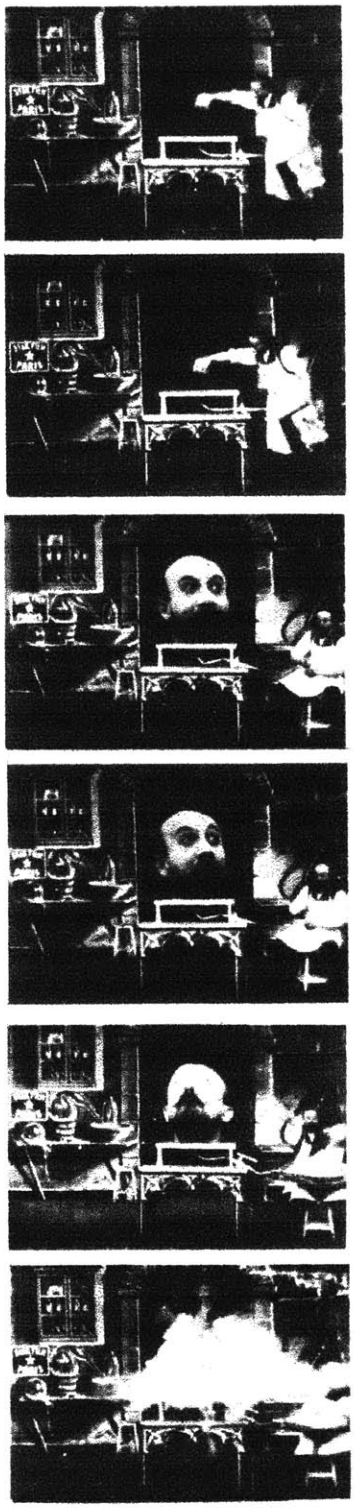

Figure 5.2 The Man with the Rubber Head (1902) (frame enlargements)

Chapter 6 The Importance of Vision Apparatuses of the Nineteenth Century

The nineteenth century marks the end of the Renaissance creator who worked with science and art and the beginning of the engineer and artist as separate entities. The devices and inventors of the nineteenth century have been neglected in the study of art and technology. They have been relegated in the name of progress to the status of precursors to cinema and television. *Digital Diorama* is in the tradition of these devices and has been influenced more by them than contemporary art or technological sources. With the advent of digital image technology vision has become completely severed from the tactile method of perception. It has become mathematically encoded into bytes. This data is soft and pliable, unlike the hard storage of waves and particles via light and the chemicals of photography. Vision was the first of the senses to be susceptible to these illusions. As the technology develops with this century's device, the computer, the senses of hearing and touch are the next in line for 'progress' (if not already manifested in virtual reality environments) for example, "holographic audio" and tactile feedback devices.

Giovanni Battista della Porta's use of live elements and miniature models created an artificial environment in the sixteenth century. Della Porta expanded the camera obscura beyond the idea of how it functioned in relation to the construction of the histories of photography and cinema. It is commonly presented in the histories that the only use of the camera obscura was as a tool to record nature more 'naturally' and as a device to render perspective more accurately. Della Porta's description presents an amendment to the common history of technological progress. Della Porta's use of the camera obscura to create an artificial landscape has influenced *Digital Diorama*. The realization that the camera has and continues to produce seamless fabrications is one of the underlying ideas of my project.

Kircher's Catoptric Theater created an artificial landscape of information, carrying della Porta's camera obscura to a new level. *Digital Diorama* has expanded the Catoptric Theater. Kircher's idea of storing information on discs and then playing them out in a constructed environment has influenced the project. I have created an installation that projects a multitude of information into a space that is stored in a hidden apparatus.

Robertson's Phantasmagorias utilized hidden magic lanterns to create the special effects. Robertson's site specific location in an unused Capucine Chapel full of the

remains of deceased monks certainly highlighted this faux supernatural experience. Robertson freed the projector from a stationary position. By the motion of the lantern Robertson was able to create changes in scale of the projections. Melies used a similar method in his films to create a change in size of the subjects that influenced cinematography by introducing camera movement as an important element of the narrative.[30] Robertson's use of audience participation or interaction combined with magicians' stage tricks created a seamless performance. The design and implementation of the software for *Digital Diorama* combines both the interaction and the use of illusions similar to the Phantasmargoria.

Physicists Peter Mark Roget and Michael Farady, in the early 1820s, experimented with stroboscopic effects by observing rapidly turning spoke wheels passing fences influenced Plateau's Fantascope and Stampfer's Stroboscope. These devices generated motion by surpassing the ability of the mind/eye to perceive. They led to the realization that perception and the senses were filtered through the brain. Horner's Zoetrope made the viewing of animation a more passive experience. Uchaitus's improvement of the Praxiscope, Zoetrope and Phenakistoscope for military training presents a new chapter for the use of the visible language. These

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[30] See Hammond, p 80 and the illustration in Chapter 5 of this thesis

products and experiments of early motion picture devices can be used as tools to understand the history and the future of Digital Video Interactive technologies. This new technology can not be understood without this history. DVI relies more on this history than the later history of film and television. The cinema and its descendants rely more on the linear method of narrative. With Digital Diorama I have replaced linearity with 'active and passive' interaction of the computer.

Barker's Panorama was the Panopticon turned inside out. The Panorama enabled all (who could pay) entrance to the watchtower. Unlike the true Panopticon the Panorama only created the illusion of enabling the viewer with power. The Panorama reinforced the status quo that was represented by Bentham's Panopticon with its philosophy of reform through constant unverifiable surveillance. The ambulatory viewer became an actor, not the omnipresent guard in the spectacle of the peripheric ring of surveillance. The interactive viewing experience of the landscape afforded the panorama's ability to collapse time and location. The representation of surveillance is an important aspect of my project. I have retained aspects of the Panorama and the Panopticon by the use of projected landscape and DVI technology. The act of surveillance is encoded into the idea of creating an electronic town meeting. I see the digital component of my

project as playing the didactic role of watchtower of the Panopticon and the viewing salon of the panorama. This ambiguous role of the computer is a reflection of the potential successes and pitfalls of digital information.

The diorama is the most representative device of the nineteenth century. It combines all the previous devices into a machine that incorporates the physical and the physiological role of vision. The diorama combined the projection apparatus with some of the interactive qualities of the panorama. The viewers become part of the machine. Illusion was created as a performance that remained hidden in the instrument. The play of time, day to night, the seasons and even the Pleorama's movement through space and time were all achieved by mechanical aspects. Unlike the Panorama the image was projected towards the viewer creating a closer parallel to the watchtower of the Panopticon. The interactive freedom of the Panorama was lost to the rigid mechanisms of the apparatus. The artificial landscape created by the diorama has influenced my project.

The critical theories of Crary, Baudrillard, Debord, and Foucault, to name the few that stand out, have been important elements in the construction of my thesis. I have chosen the landscape to work with. Unlike the landscape of the past I have encoded the effects of the industrial revolution and manifest expansion of capitalism. The problems of pollution

and waste are by products of the industrial past, present, and future. This problem does not spring up by itself, we are all producers of waste. That is why we are able to enter into the *Digital Diorama* and enter the 'painting', unlike Daguerre's Diorama where the viewers were confined to a specific component in the machine. The boundary of the physical devices will be erased and all that will remain is the digital structure.

The documentary that the project *Digital Diorama* is based upon is entitled *Pollution, Waste, and Recycling in Cambridge*. It is composed of ten interviews that present these subjects from various points of view. The advantage of interactive systems for the presentation of documentaries are that you able to create a multitude of views on the subject that the viewer is able to access in a personal fashion. I have created a framework to connect these issues which are generally presented as individual subjects in conventional documentaries. The framework that links the subjects are the ability of the viewer to video annotate themselves into the documentary. In Michelango Antonioni's film *The Passenger*[31] an interesting exchange happens between a documentarian and his subject:

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[31]Michelanglo Antonioni dir., *The Passanger*, with Jack Nicholson, Carlo Pinto Prod, 1975.

Locke (a documentarian making a film about a national liberation in an unspecified north African country): Yesterday when we filmed you at the village, I understood that you were brought up to be witch doctor. Isn't that unusual for someone like you to have spent several years in France and Yugoslavia? Has that changed your attitude towards certain tribal customs? Don't they strike you as false now and wrong for perhaps for the tribe?

Native (rebel leader): Mr. Locke. There are perfectly satisfactory answers to all your questions. But I don't think you understand how little you can learn from them. Your questions are much more revealing about yourself that my answer would be about me.

Locke: I mean them quite sincerely

Native: Mr. Locke. We can have a conversation, but only if its not just what you think is sincere but also what I believe to be honest.

Locke: Yes, of course, but....

The rebel leader now turns the camera around so that Locke is centered in the frame

Native: Now, we can have an interview. You can ask me the same questions as before.

Pollution, Waste, and Recycling in Cambridge actualizes the concept that documentaries present a mirror of the person who creates them and their culture. With interaction and the users ability to annotate themselves, the documentary installation also reflects the users biases. The project evolves presenting a multi-dimensional portrait of the community.

In Daniel Bell's book *Post Industrial Society* published twenty four years ago, he begins the concluding paragraph of the introduction with;

> "Post-industrial society is organized around knowledge, for the purpose of social control and the directing of innovation and change; and this in turn gives rise to new social relationships and new structures which have to be managed politically."[32]

The digital component of my project demonstrates these new structures and social relationships. It is built around the didactic roles of the alleged 'information revolution'. *Digital Diorama* presents a documentary installation based on the structure of a town meeting. This forum contains records of the problems of waste and presents the user the ability of the user to annotate these records with their own opinions. By creating this interactive experience *Digital Diorama* reflects this the new structure of post-industrial society and provides the user a method for managing the information.

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[32] Daniel Bell, *Post-Industrial Society*, (New York, Viking)1968.p. 24.

Chapter 7-Technical Description

My *Digital Diorama* is an installation based on the concept of an electronic town meeting[33]. The viewer can witness and participate in a community discussion about the issues of the disposal of wastes in homes and industries. The viewer watches the base documentary of interviews with government, businesses, activists, and citizens. When the viewer wants to respond, comment, or pose a question s/he can stop the documentary and video record her/himself into the piece. Since this is an interactive environment, the video clip is not inserted into a linear path like the conventional documentary, but into the category chosen. As the *Digital Diorama* progresses the viewers are free to choose which base subjects they are interested in and pick the interviews and the past video annotations they desire to see or respond to.

The installation consists of two areas separated by a screen. On the front side of the screen are video projections of the diverse landscapes of Cambridge. As the viewers walk behind the screen of landscapes they enter the town meeting. There the computer is playing the base documentary of the key

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[33]Town meetings are a New England tradition of gathering the citizens at the Grange Hall to debate, discuss, and decide the civil concerns of their town.

figures. Here the viewers can interact with the people of Cambridge.

The digital section of the project is based on an Apple Macintosh II computer, a video digitizing card, and a video camera. The Macintosh computer allows the digitization of live video onto a hard drive using the card and Apple's system software QuickTime. The program HyperCard 2.1 controls the digital movies with HyperTalk, the programming language associated with the program. Some of the advantages of digital movies are random access and simultaneous multiple video windows. The disadvantages are the size, 160 by 120 pixels (2.22 inches by 1.6 inches), and the speed in which the movie is recorded; around 15 frames per second. Another factor is the size required to store the movies. A minute of uncompressed footage requires about 3.6 megabytes of storage space. These large chunks of data affect the playback speed as well.

I have designed a HyperCard stack that acts as the documentary vehicle for the project. This stack is composed of three main levels, the introduction, the town meeting, and the video record booth. While the computer is unattended the introduction plays random video segments of the key figures and the participants who have video annotated themselves. When a person begins the stack (program) by clicking the mouse the screen changes to the town meeting level. The user

can watch the key interviews and the community responses. In the town meeting level there are two sub levels that link the original documentary subjects and present more specific information to be 'discussed' in the evolving nature of the project. The video record booth is were the viewer is able to record themselves into the documentary, with access to the video camera. When you have recorded your statement you are able to link it to one of the three levels within the town meeting section of *Pollution, Waste, and Recycling in Cambridge*.

The diorama aspect of the project consists in the installation of the digital components. The site is specific to 'The Pit' at the Center for Advanced Visual Studies. The space consists of a balcony that overlooks a 35 by 35 foot room with a pole in the center. There are stairs leading down from the balcony that reach the floor of 'The Pit' halfway of the length of the left side. The viewer enters from the balcony down a short corridor made with walls of felt. The audio of the introduction level of the program can be heard. S/he can either go down the stairs to enter the digital aspect or continue a few steps into the rotunda. The rotunda is constructed from hanging felt and has a diameter of 7.5 feet. In the front of balcony an opening has been cut out, reminiscent of a stage proscenium. A screen is seen from this opening. Aerial projections of Cambridge are projected onto

this screen. This is a rear projection screen and a felt frame that drapes to the floor. Behind this screen is the digital component which consists of the computer and the video camera.

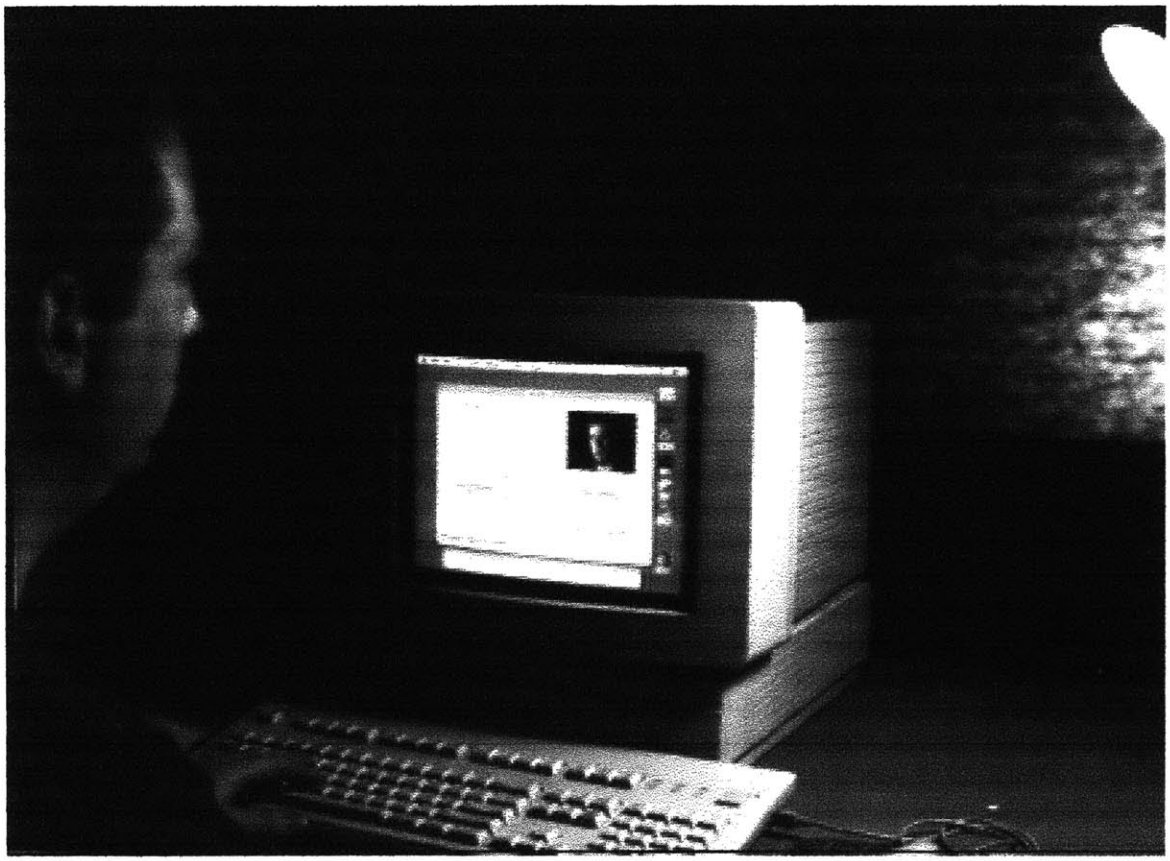

Figure 7.1 *Digital Diorama* in action

Chapter 8 The Theater of Landscape and the Future

In the previous chapters I have discussed artificial environments created by devices, performances, and installations of the nineteenth century. I have made connections to justify my project *Digital Diorama* and begun to create a critical aesthetic for the medium of Digital Interactive Video. The dominant character of these apparatuses has been the landscape. They have created artificial environments with mechanical illusions. The diorama is especially a Theater of Landscape. The main plot of this play was the journey in time and space. This was achieved by manipulation of light. *Digital Diorama* creates a contemporary Theater of Landscape and dwells on the past, present, and future of the by products of our existence. Unlike the dioramas of the past century *Digital Diorama* presents the social narrative of our landscape. It documents our existence and reflects our opinions with the problems of pollution and waste.

Digital Diorama will evolve as people interact with the installation. The structure at this point reflects my biases, but I have designed an environment that will evolve as more people interact. The thesis presentation is the first stage and, as I witness other people responding, I will be able to

refine the interface of the software to accommodate the shifting biases of the new users.

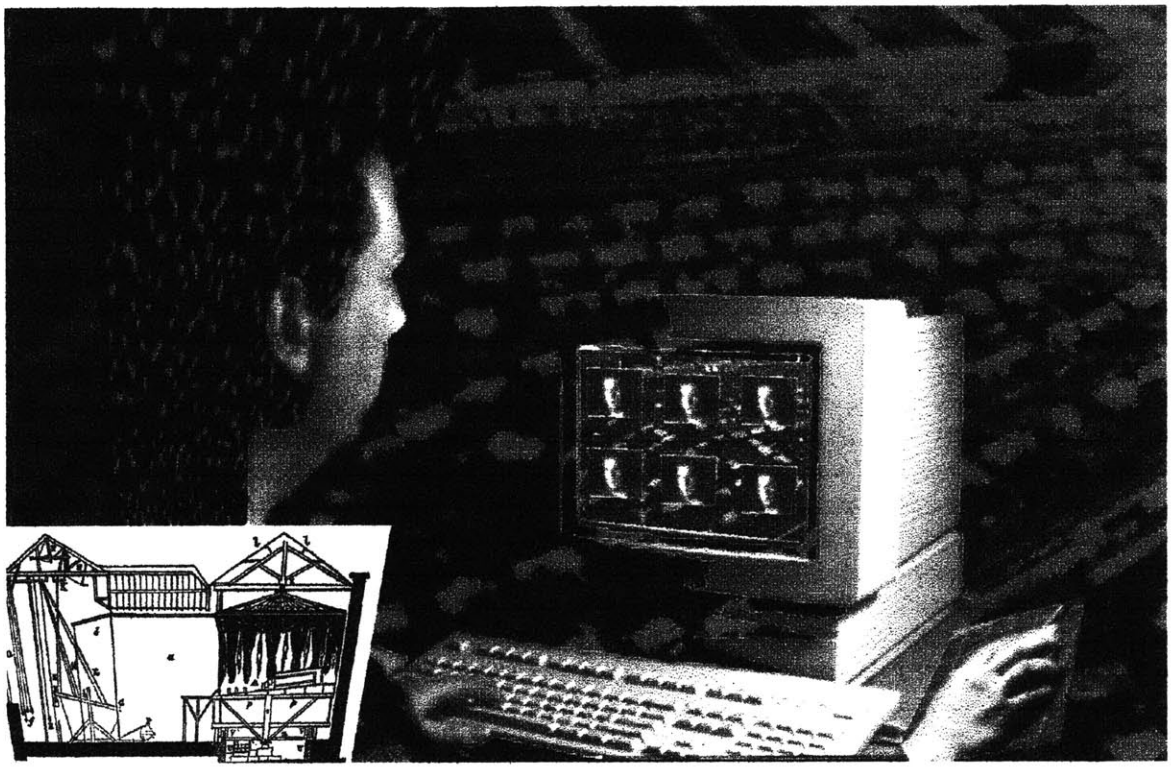

Figure 8.1 Rendering of Digital Diorama

Technical Appendix

Hardware

Computer:

Apple Macintosh IISi
20MHZ
17 Megabytes of Ram
80 Megabyte Internal Hard Drive

Video Card

RastaOps 24STV

Periphals:

FWB Pocket Hammer Hard Drive 425 Megabytes
MicroNet Syquest Drive 88 Megabytes

Video Camera:

Sony HI8 801 Camaorder

Video Projector:

Eiki LC-300

Software

Claris:HyperCard 2.1™

RastaOps:Developer Software

Apple:QuickTime™ System Extension

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Illustration Credits

Figure 1.1
Gernshiem, Helmut, *L.J.M. Dauguerre:The History of the Diorama and the Daguerreotype*, Dover Press 1968 p. 44

Figure 2.2
Liesegand, Franz Paul. *Dates and Sources:A Contribution to the History of the Art of Projection and to Cinematography* trans and ed.by Hermann Hect The Magic Latern Society of Great Britian 1986 p. 10

Figure 2.3
Liesegand, p 18

Figure 2.4
Liesegand, p 18

Figure 2.5
Crary, Jonathan. *Techniques of the Observer:On Vision and Modernity in the Nineteenth Century*, MIT Press 1990 p. 107

Figure 3.1
Milman, Miriam. *Trompe-L'oeil:Painted Architecture* Rizzoli 1986 p. 93

Figure 3.2
Foucault, Michel. *Discipline and Punish:The Birth of the Prison*, trans. Alan Sheridan, Vintage Books 1979 p.171

Figure 3.2
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Figure 3.3
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Figure 4.1
Gernshiem, p. 21

Figure 4.2
Gernshiem, p 21

Figure 5.1
Hammond, Paul Marvellous Melies St. Marks Press 1975
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Figure 5.2
Hammond, Paul Marvellous Melies St. Marks Press 1975
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Figure 7.1
By the author

Figure 7.2
By the author