THE FEAR WITHIN: EARLY SCIENTIFIC FILM AND ITS INFLUENCE
ON THE HORROR GENRE

A Thesis
Presented to the
Faculty of
San Diego State University

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts
in
Liberal Arts and Sciences

by
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Summer 2010
SAN DIEGO STATE UNIVERSITY

The Undersigned Faculty Committee Approves the

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The Fear Within: Early Scientific Film and its Influence on the Horror Genre

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5/18/2010
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ABSTRACT OF THE THESIS

The Fear Within: Early Scientific Film and its Influence on the Horror Genre
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Master of Arts in Liberal Arts and Sciences
San Diego State University, 2010

The human body has been an essential part of the evolution of film history. From the motion study photographs of Étienne-Jules Marey and Eadweard Muybridge in the nineteenth century through modern day medical reality television, the human body has proven to be an element of fascination and focus within media of all types. This thesis argues that early scientific film that examines nature and the body has influenced the development of the horror genre. The connections between science and film continue to be under-researched. Rather than focusing on film’s influence on science, this thesis finds that science has shaped the history of the film genre. Using the previous work of film scholars and theorists like Lisa Cartwright, Virgilio Tosi, Rick Altman, and Tom Gunning, this thesis will consider two horror films for case studies: The Unknown (1927) and Nosferatu (1922).

This research finds that in these two case study films, many elements of horror are based on societal and cultural knowledge about nature and the human body. The Unknown, portrays the fragmented and excessive body as an object of fear for the viewer and the characters within the narrative. Nosferatu, depicts the villain and his evil counterparts through their out of control bodies and their misunderstanding of nature. Both of these films project the human body as something to be frightened of, and this study pinpoints the moments in which evidence of this correlation can be found. These films are analyzed using an interdisciplinary perspective that examines film using historical, sociological, and theoretical frameworks to show the influence of turn of the century scientific film upon horror genre development. This project thus examines the early scientific film during the turn of the century and how unintended screenings to uninformed audiences contributed to societal fears of nature and the body, and how these fears in turn contributed to the horror genre.
ACKNOWLEDGEMENTS

I would like to express my deepest appreciation to my thesis chair, Professor Louisa Stein, who has been such a motivating and inspiring force in my quest to become a film curator. Her patience and knowledge has compelled me to follow my dreams in pursuit of the preservation, study, and screening of early film.

I am also eternally grateful to my future husband, Ben, for his constant love and faith in me. Without him the idea for this thesis would never have occurred to me and certainly without his encouragement and assistance I would not have been able to complete it.

I would also like to thank my wonderfully supportive parents, who always have and continue to help me with all my endeavors. I especially thank my dad whose incredible commitment to his work in medicine has made the scientific world a constant and essential part of my life.
CHAPTER 1

INTRODUCTION

The surrealist and avant-garde films undoubtedly owe a great deal to filmmakers like Lucien Bull, Jean Comandon, and Marey. It could not have been solely a coincidence that at the Vieux Colombier in 1924, a number of Victorian-era scientific films were shown and surrealist filmmakers like Germaine Dulac were in attendance (L. Cartwright 40). Viewing Dulac’s *La Coquille Et Le Clergyman* (1927), (released three years following the screenings at the Vieux Colombier) the thematic ties to the psyche and investigations into dreams and the unconscious show a great deal of similarity with early neurological study films. *La Coquille Et Le Clergyman* is recognized as the first Surrealist film; it lacks a structured narrative and uses images to convey themes and ideas, rather than following a traditional plot line. In the film the viewer is made an active participant in the film. At the very opening of the film, the camera itself leads the viewer down a hallway to the room in which a clergyman fills and smashes glass beakers. By using this technique Dulac takes the film into the atmosphere of dream and fantasy. This dream could even belong to the viewer in the audience. This idea of making the film audience an active participant in the narrative echoes the early surgical films of Von Bergmann and Dr. Doyen (which will be discussed in depth later in this study).

Looking at the relationship between film and science, in the following research I examine their influence upon one another. I analyze two case study horror genre films and look at the history and circumstance surrounding their production that bears the impact of early scientific film. I study the films themselves, their artistic origin (in literature or elsewhere), production, and the societal timeline that surrounds their inception. Using this interdisciplinary way of approaching research, I find popular horror films to show a great deal of influence and origin within the early scientific film. These studies also lead to broader questions regarding the history of the relationship between science and the arts, and its evolution throughout history.
In this modern age, media surrounds so many aspects of our lives that film can be found almost anywhere: from outdoor screenings in public parks to deep within archival libraries. There are a great number of academic disciplines of which film is so much of an essential method of study that it has become part of the discipline itself. In the study of culture, identity, music, art, language, and history, scholars repeatedly reference and study film as a means to examine subjects in with both visual and aural representations. A medical journal is one unlikely place to discover the mention of film. Science and art having long been understood as opposing forces; Thomas Henry Huxley and Matthew Arnold engaged in questioning an endless debate on the roles of arts and sciences beginning in the 1880s.

Despite the differences in the disciplines of film and science, they are intrinsically linked to one another. In my research, looking through medical journal databases, articles both referencing and about the cinematograph are surprisingly abundant and date back to 1897. The articles analyze the invention of film and the studies being done which utilize the cinematograph and it’s effects on people of all ages. They truly encompass many different paradigms and aspects of Victorian life. During the turn of the century, filmmaking and medicine had a symbiotic relationship that differs greatly from the modern day. Film was a central part of the scientific and medical world in the early twentieth century, and science was a prominent part of the entertainment industry both thematically and educationally.

Considering the complexity of this relationship between film and science, the areas in which they overlap continue to be under-researched. While a great deal of history and theory has been done in the film and scientific worlds separately, there have been few studies interrogating their interconnectivity and influence upon one another. In the following I investigate the film genre and how it has been altered and re-invented by early scientific and medical film. I study these developments on genre and investigate science and its relationship with film history. By exploring this association I hope to prove that science and medicine have shaped the evolution of film history.

In order to minimize repetition, I will refer to both scientific and medical film under the auspice of “scientific film.” Medicine (while definitely its own field of study) generally falls under the broad umbrella of science: or investigations that have to do with nature. In my research I discover some work done on the history of science and medicine and its intersection with film, and even some that look at how science may have helped to invent the
cinematograph. However, I found very little or incomplete studies done on the effect of the scientific film on film history.

I see a strong correlation between the films of scientists made in the Victorian era with the early horror films of the 1920s. In this early stage in film genre development, I have sought to uncover a possible origin for the horror genre and why the human emotion of fear became tied to certain images. Society often gives films a specific genre classification based upon nothing but a movie poster, trailer, or film title. Rick Altman has extensively researched the origins, manifestations, and influence of film genre studies. His work has shown that genres are as integral to film history as the camera. Altman uses the following quote from Richard T. Jameson to introduce his opposing arguments for genre origination.

Movies belong to genres much the way people belong to families or ethnic groups. Name one of the classic, bedrock genres-Western, comedy, musical, war film, gangster picture, science fiction, horror-and even the most casual moviegoer will come up with a mental image of it, partly visual, partly conceptual (qtd in Altman 9)

This comparison between the human family/ethnic group and the movie genre classification system implies that movies are born into genres much in the way a human being is born into a certain family. Jameson makes this association implying that genre is not created by a society or critic instead it is given life simultaneously with the film. In the following study, I examine the horror genre and its origins through history, society, and culture. Just as a human does not select a family, the genre is shaped by circumstance and cultural and societal history. It is a product of its specific time and place.

From audience perspective, genre is deeply rooted in film history, theory, and analysis. Much of the film genre as we know it has been created by the production team, marketing, advertising, and the viewer themselves. This team acts as the family of the film, giving it its identity and life. So why then are the most authentic images-- of nature, animals, and the human body itself--so linked with horror? Upon examination and identification the most normal and factual images have become a part of the horror genre. In my research I show that these images of fear were first shown to public audiences in scientific film. I also draw a relation to the body as a structure for human identity as well as the film genre. In the living and dead physical body, the evidence of a person’s physical and psychological history can be found. In my study I use the human body as a reference point to cultural identity for
the individual as well as their art and creativity, which manifests itself in the history of their film.

Taken into context, Victorian films are quite beautiful and awe-inspiring, as they exhibit the first techniques of filmmakers with a world of possibility in front of them. These early techniques coupled with the raw realism of emerging scientific studies as well, have a slightly unsettling quality for the viewer. From the audience perspective the film of spectacle and attraction has become synonymous with film prior to 1906. Perhaps it is this raw realism of turn of the century films that can make viewing a real 19th century surgical procedure, more shocking than the epic chariot scene in *Ben Hur* (1907). For the modern viewer there is also some horror involved in the medical advances that they dealt without during the turn-of-the-century. For the purpose of this research though, it is most beneficial to look at these films from the Victorian perspective. What made these scientific films frightening to the audience of that time period and why did it translate into the horror genre in its infancy of the 1920s? In the following chapters I address this question using an interdisciplinary approach: answering this question from the perspective of a historian, a film theorist, a scientist, and a sociologist. Given my research, I explore the interconnections between the horror genre and the human being’s fear of their own physiology.

In the early stages of this investigation, I have discovered that a great deal of our scientific film heritage remains undiscovered, lost, or inaccessible. While there is much coverage of the preservation necessary for our popular film heritage, there also continues to be a great need for protection and preservation of “orphan” films. These are the films made outside of the traditional studio system that do not fit into any known genre.

These materials are the documentaries, newsreels, avant-garde, and independent film, home movies, amateur and local productions, educational and industrial shorts, et cetera. The orphan film metaphor has been largely responsible for putting these moving images on the map of our cultural heritage (Lukow).

The attention to popular genre films and their preservation shows what an important role the genre plays in film history. It has even become a part of the popular film’s survival and existence. “Orphan” films are typically underrepresented and are given less attention in terms of preservation. One of the films I analyze in the subsequent chapters ran originally eight minutes long, of which only a fraction remains. The lack of research done on these films
within the art world has lead to their invisibility. Many of these films are so old and underrepresented that there is a definite reason to fear for their loss to generations to come.

Tom Gunning’s work has shown early cinema prior to 1906 to have a specific aesthetic approach that cannot be found in later works. He uses the term “cinema of attractions” to classify this entirely different type of film.

To summarise, the cinema of attractions directly solicits spectator attention, inciting visual curiosity, and supplying pleasure through an exciting spectacle—a unique event, whether fictional or documentary, that is of interest in itself (Gunning 58).

It is the visual curiosity of scientific films (and film in general during these early years) that makes them a part of the “cinema of attractions” that Gunning describes. They also were made mostly prior to 1906, which fits into Gunning’s discussion of time period and conceive of the same role for the camera. In his discussion of types of film and genres, he does not address scientific film as a sub-category within this period in filmmaking. Many medical and scientific films were made in the same pre-1906 period and do exhibit the same “exciting spectacle.” They also are creating a pleasurable experience for the audience through their “visual curiosity.” The discernable difference is that early scientific films were not intended for showing to a public audience. Although scientific filmmakers may have intended these films for educational purposes, they often end up becoming a part of the world of public entertainment. In viewing these films as entertainment or art (rather than solely educational) one can find a great deal of stylistic similarities with popular genre films.

Lisa Cartwright addresses the connections between the scientific film and popular entertainment in her book *Screening the Body*. While her work focuses more on the influence of motion study techniques, she does discuss the underrepresented nature of the scientific film and the lack of studies, which show their influence on popular film.

What remains largely unconsidered is the extent to which the particular visual modes that were operative in laboratory techniques like kymography or chronophotography, or in the science film, are integral to other genres of the cinema and of popular visual culture (L. Cartwright 2).

Cartwright’s main focus is to examine the affect the medical and scientific imaging world has had on the shaping and altering of human life. The human body is the focus of her work and a major element in one of the films I examine in the following study. The human body in motion has held a fascination for scientists and artists through the earliest recorded histories.
In prehistoric times, cave paintings depicted the body in a state of movement: running, swimming, and walking. While early photography could capture the body in a static state, it was this need to capture life and replicate its movement that brought about the invention of the moving picture.

Cartwright argues that this capturing of life on film, in x-ray, and even under a microscope, have shaped not only the human beings’ understanding of their own body but also their comprehension of life. Cartwright ultimately focuses on the influence of scientific imaging on human life, and in turn does discuss its influence on culture.

The pleasures of “distanced” analytic viewing I argue, are not peculiar to the genre of the motion study but have pervaded the popular cinema and other institutions (L. Cartwright 5).

She finds that the scientific gaze (that is more analytic and distanced) has become more a part of popular film than one might imagine. She uses her proof of this as a means to show the affect on the human perspective and discusses some of the cultural influence that relates to scientific imaging. Cartwright argues that the scientific gaze originated by motion studies, scientific film, and medical imaging, has become a part of culture and everyday life.

Virgilio Tosi has argued that scientific research brought about the invention of the motion picture camera. As he points out many of the early motion study chronophotographers such as Etienne-Jules Marey and Eadweard Muybridge, experimented with the motion picture camera (and similar inventions that pre-date it) with medical and scientific purposes in mind (40-136). Tosi discusses the pre-history of scientific cinema, relaying the invention of optical toys like the thaumatrope and stroboscope. He discusses inventors like Jan Evangelista Purkyne, and his career as both a physiologist and the creator of the Kinesiskop (an optical toy that uses two wheels to trick the eye into seeing an image move).

Tosi’s aim is to use this timeline of convergences between film and science, to prove his argument that scientific research brought about the invention of the cinematograph. He also pre-dates the birth of scientific film to the attraction cinema that Gunning discusses. By naming scientific film as the first incarnation of film, he aims to show that it was science that brought about the invention of film. While his research is extensive, interesting, and exciting, he is viewing the scientific film as a part of the study of science. In the subsequent chapters I discuss the scientific film as a part of the study of film history, while addressing Tosi’s
timeline. I examine the popular silent film with the assumption that scientific film is happening prior or simultaneously with the cinema as spectacle and attraction.

I approach the study of genre from all angles, much in the manner that Altman uses. I research the genre in terms of the time and place in history, theme, and directorial style, I look at film from the horror genre and analyze how early scientific and medical films could have offered a stepping-stone to their creation. I am specifically looking at silent narrative film in the 1920s in order to find the beginnings of this influence. In looking back in history, past the classic Hollywood studio era, I can examine the first evidence of artistic choices. These beginnings show where popular entertainment first found its place as an art form separate and unique from photography. I chose very early or “pre” horror films with the aim of discovering the beginnings of the genre.

In the following chapters, I look at two case studies of silent films that are commonly classified within the horror genre. For each film there is a shot analysis in its relation to scientific and medical film. I research the society and world that produced the Victorian science film, taking into consideration the surrounding world into which the films were produced and making every effort to understand the historical perspective. I study and use the information available regarding my chosen case study films and how it links to the scientific film. I investigate the history of science and medicine while keeping in mind what advances had taken place and what was on the verge of discovery. In my case study films I use direct relations to scientific film techniques used and thematic ideas that added their influence to the silent horror film.

In the first chapter I research the films and career of Dr. Eugene-Louis Doyen. Previous research on Dr. Doyen often was limited, and information about him can be found in a wide variety of disciplines. In selecting his films for research work, it has been difficult to find any remaining recordings of his work: the one film segment I eventually found and analyze was re-constructed and combined into an anthology of scientific film by Virgilio Tosi. His remaining work seems to be scarcely found in the United States in both film and medical libraries. The British Universities Film & Video Council has recently made available Tosi’s work on film and in written word. In this chapter I discuss the similarities between Dr. Doyen’s film with that of the work of Hollywood director, Tod Browning. I analyze Browning’s unusual silent film The Unknown (1927), in which the human body is split into
theoretical and real fragmented parts and amplified as a means for in sighting horror. Using this film I draw a relation to Dr. Doyen’s surgical procedure films, and find a means for why Browning may have chosen certain themes or images to create his horror film.

In the second chapter, I research a number of scientific films including the nature “trick” films of Percy Smith and the neurological study films of Walter Greenough Chase. I study the microcinematographic films of Jean Comandon and show exact techniques replicated in the case study film. For the case study film I use F.W. Murnau’s Nosferatu (1922) and examine the many scenes which bear a strong relation to scientific films. As the first recognized horror film, it seems a natural choice to prove that the scientific film shows strong influence from the horror genre. The British Film Institute and the Wild Film History database are invaluable overviews in these filmmaker’s work and viewing the films themselves.

My aim in pursuing this research is to give scientific film an important place in film history, as more than a sub-genre of documentary or educational film. In scientific history there is some recognition for these films, but as an element of popular entertainment it still seeks to find its place. My hope is that this research will put scientific film in a position of importance for the archivist, the preservationist, the scholar, and film teacher. Giving scientific film its due importance in film history would educate and enlighten historians in the disciplines of film and science and turn a window onto the viewing audience and its understanding of the human body.
CHAPTER 2

THE FRAGMENTED BODY AND TOD BROWNING’S BRAND OF HORROR

In *The Unknown* (1927) director & writer Tod Browning weaves a story that revolves around the deformed and fragmented human body. *The Unknown* does not easily fit traditional genre classification, although given its startling themes it perhaps fits best into the early developing horror genre. The main unifying theme is Browning’s focus on the human body in its entirety and in fragmented parts. This theme, while seemingly an unusual one for Hollywood, is abundant in a great deal of Browning's work. Tod Browning created an oeuvre of work quite unlike any other director in the motion picture industry. Drawing upon his own background working in carnivals and circuses, many of his films focus on the stories of people who have unusual professions and appearances, specifically those of the circus performer. The human body plays a central role in all of his films. In *The Unknown*, Browning uses title cards, imagery, and plot to create a fragmented version of the human body. The portrayal of the medical understandings of the body is ominous and surreal, and is in direct line with the grave nature of the narrative. These perceptions about the body that Browning creates in *The Unknown*, have the same visual and textual themes as the early surgical films of directors like Dr. E.L. Doyen.

THE NOVELTY OF THE BODY

Dr. Eugene Louis Doyen was one of the first to capture surgical procedures on film. He recorded sixty surgical procedures between 1898 and 1906 in which he performed each operation. His most famous procedure and film involved the separation of Siamese twins who worked for the Barnum and Bailey circus, Doodica and Radica Neik. It is this film’s intrinsic ties to the circus, the realm of the other, and its popularity as a screening for circuses subsequently, that I will argue for its influence on *The Unknown*. Thematically *The Unknown* revolves around the story of the body as a physical entity and an inhuman perspective of it. It also showcases the body as a true novelty during the turn-of-the-century. As European and
American society was in a state of awe and fascination with their own bodies, a film showcasing its capabilities and functionality was truly an attraction. In *The Unknown* the body is presented in a wide variety of states: excessive, disabled, and in fragments. An example of bodily excess in the film can be seen in, Lon Chaney’s character Alonzo, when he is discovered to have two thumbs on his hands. He is also seen using his feet for tasks that hands are typically used for. As an example of a disabled body in the film, Alonzo and the romantic hero, Malabar, are seen unable to touch the woman that they love, due to her fear of men’s hands. It is because of Nanon’s fear that Alonzo and Malabar are unable to use their bodies and thus become disabled when they are near her. Finally, an example of the fragmented body can be found in Nanon, the female lead, who relates the desire to which she has been subject to the male hands that have molested her throughout her life.

**A Cinematic Medical Teacher**

All of these thematic body variations can also be found in the early surgical films of Dr. Eugene Louis Doyen. His most infamous film, *Separation of Siamese Twins* (1902), bears a striking resemblance in these thematic variations as well as in the subject matter and visual style. Dr. Doyen’s film documents the surgical separation of two circus performers that happen to be Siamese twins and also portrays the body in excess, disability, and in fragments. There has been little written in film history about Dr. Doyen. His work bridged both the medical and artistic and he saw himself as a leader of a medical educational movement through his use of film. Despite the lack of mention of Doyen in film history and theory books, he is often mentioned and discussed in medical and surgical history books. In “The History of Modern Surgery” there is not only a discussion of his medical achievements but also of his work as a filmmaker.

An interesting man, who performed an early lung resection, was the brilliant but intolerably self-advertising E.L. Doyen of Paris. The date of his operation is about 1894; among his other feats, Doyen introduced the cinematograph camera into surgery as early as 1898, and separated the Siamese twins Radica and Doodica amid a blaze of publicity that puts any recent attempts into the shade. He is said to have written his own account of the operation for publication in the French popular press. (F. Cartwright 224)

Doyen used film as a means to promote and teach the surgical techniques he would employ and also (at his own mention) to improve his own skill and muscle memory. He was a passionate promoter of his films who sought out publicity and media coverage. He sought to
teach medical students through his filmed operations, starring himself as the surgeon. He also enjoyed watching his own surgeries and found he could learn a great deal from being able to study what he had done well and what he could improve. According to Doyen, his most important student and audience member was himself, as he reports that he learned a great deal from watching himself on screen.

When I saw one of my operations take place on the screen for the first time I saw how little I knew myself... The cinematograph has made it possible for me to perfect my operating technique significantly. (Tosi 167)

Doyen saw filmmaking as a means to better himself, to see at what points during an operation he could speed up the process or find a different means to achieve his goals. Doyen thought of himself as a kind of revolutionary that had discovered the definitive teaching method for instructing young medical students. Doyen thought a great deal about his students (treating them much in the same way many directors see their audiences) and how they would respond, react, and interact with the events taking place. He also saw the cinematograph as a tool within his operations, just as important as any surgical tool (Tosi 167). He taught himself with it, improved his techniques, and was able to teach his students from his perspective what an operation was like.

**Theatricality in the Operating Theatre**

Historically, surgery during the 19th century was commonly held in an “operating theatre” in which students could learn surgical techniques by observing actual operations.

A modern operating theatre is very different; in fact, the American term ‘operating room’ is a better description. The old theatres were enormous because they were used for lectures and demonstrations; the surgeon gave a talk about his case before operating and usually described the stages of his operation as he worked. (F. Cartwright 284-85)

The best way that students could learn surgical techniques before undertaking them for themselves, was by viewing an expert teacher in an actual surgery. In this environment the student acted in place of an audience, much in the way early cinematic audiences viewed the motion picture in general. Surgery was in such an early state of development that it was viewed as a sort of novelty. As Tom Gunning argues for the early cinema as an early era classified as the cinema of attractions, the scientific cinema was a part of this movement. Instead of relying on the cinematograph images of people in motion or man-made inventions of the Industrial Revolution, the early scientific cinema relied on the attraction of the natural
world and the human body itself. The body and its inner-workings, was such an attraction within the operating theatre that paired with the cinematograph images it served as a double novelty. During this time period, the circus and specifically the freak show, was the epicenter of novelties, and therefore served as a fascinating setting for filmmaking.

Doyen wanted these films to be shown at conferences that he attended worldwide, to which he provided his own commentary (Baptista 43). Some of his surgical practices were considered radical and therefore he could show the benefit of his techniques through the presentation of his films. He believed in speed as an asset in surgery, working at the time when anesthesia and antisepsis were discovered. The common belief amongst the medical community at this time was that the length of the surgery made little difference. Doyen’s surgeries were done quickly to reduce the trauma to the patient, thus his films were presented as a means to prove his integrity as a doctor.

Thierry Lefèbvre describes the “choreographic” quality of Doyen’s films, finding them presentational and without error, much like a well-rehearsed theatrical performance. José van Dijck expands upon these ideas in her book *The Transparent Body- A Cultural Analysis of Medical Imaging*.

The setting in all of Doyen’s films is simple: The surgeon and his assistants stand next to the operating table, facing the camera (French film historian Thierry Lefèbvre designating both surgeon and camerapersons) Two cameras record the actions of the surgeon, whose face is hardly ever seen. Patients appear as anonymous, face-less objects-only body parts essential for surgery are shown. This particular setting underscores the purpose of the films; all attention is geared toward recording the medical act, while the roles of both patients and surgeons are downplayed. (27)

Van Dijck describes these scenes and the role of the patient and surgeon during the procedure. She notes that the patients are rarely shown on film, the surgical sheet that covers them makes their bodies appear fragmentated and split into pieces. Their faces are almost always covered, and the body parts being operated on set against a white table and framed by the white sheet covering the rest of the body. This fragmenting of the body de-humanizes it and makes it appear more like a dissection in a science lab than an active operation on a living being.

While the main attention is drawn to the medical act, Doyen did not seek to downplay his role as the surgeon or teacher. Instead he found the surgeon’s personality to be fundamental to the films themselves. This was fundamental to the instruction of his students.
As Doyen repeated endlessly, his films should above all demonstrate the surgeon’s “personality”, defined by the latter’s undistracted “concentration” and “self-confidence”- features that a scientific paper or lecture, would never adequately demonstrate. According to Doyen, demonstrating the surgeon’s self-confident personality while operating was as important as demonstrating any particular surgical technique itself. (Baptista 45)

Doyen’s view of the surgeon and his role differed greatly from his associates in the Victorian age. Very few surgeons thought about documenting their confidence and personality on film. As much as Doyen sought to improve his own skills, he also saw himself as the leader of an important educational movement. His major goals in filmmaking were to instruct the medical students in the best possible way.

According to Doyen, one could not understand a new surgical procedure by reading about it, or even by watching it being performed by any other surgeon: one had to see the procedure being carried out by its own creator. (Baptista 46)

The kinds of terms Doyen uses to describe the surgeon’s role, such as “personality” and “self-confidence” could easily be attributed to a performer. Doyen shares many of the attributes of a theatrical performer and his films show his understanding of spatial relations and presentation. His need to film his operations and show them to his students in order to “see the procedure being carried out by its own creator” bares a striking resemblance to the basis behind the technique of method acting derived from Konstantin Stanislavski.

The Stanislavski method involves the actor being “in the moment” but always one step away and slightly detached from the actual experience. Doyen tried to create a similar method for teaching his students by having them watch his filmed surgeries. Doyen believed medical students could only learn the technique of the surgery by being one step away from the actual experience.

If you take all these internal processes, and adapt them to the spiritual and physical life of the person you are representing, we call that living the part. This is of supreme significance in creative work. Aside from the fact that it opens up avenues for inspiration, living the part helps the artist to carry out one of his main objectives. His job is not to present merely the external life of his character. He must fit his own human qualities to the life of this other person, and pour into it all of his own soul. The fundamental aim of our art is the creation of this inner life of a human spirit, and its expression in an artistic form. (Stanislavski 15)

At the core of Stanislavski’s method was to “live the part.” To have such a great understanding about the person whom you are creating on the stage, that your body acts as a vessel for the emotional life of the character. This idea keeps the actor one step away from
the experiences of the character. Doyen’s films can be looked at as utilizing a very similar idea. Looking at Doyen’s films with his own beliefs in mind, it is evident that he sought to keep his audience one step away from the experience of performing the surgery in all aspects. The films demonstrate the surgeon’s perspective and invite the audience to be part of the operation. As seen in the layout of the scenes, positioning of the surgeon’s hands and body, and the placement of the medical assistants, there is a consciousness of the viewer. Watching the film, it is as if the viewer could be one of the assistants, handing over surgical tools and checking for vital signs.

This presentational style of film in keeping the audience in mind while shooting the film gestures more towards a theatrical kind of film. It fits in perfectly to Tom Gunning’s theories on the “cinema of attractions.”

From comedians smirking at the camera, to the constant bowing and gesturing of the conjurors in magic films, this is a cinema that displays its visibility, willing to rupture a self-enclosed fictional world for a chance to solicit the attention of the spectator. (57)

The films made during this era of “attractions” are conscious of their audience, making the spectator a character within the film. In The Unknown, the film audience and the audience of the circus performers (whose lives are the narrative) are one and the same. Silent film has many similarities with the theatre, using a presentational performance style to make the audience part of the film. Without modern dialogue or sound, these early silent films were truly a presentational art form, in the same way that Doyen’s operation films are presentational and theatrical. Doyen’s use of film as a means to teach his students through keeping them one step away from the actual procedure shows his theatricality even in his teaching methods. These teaching techniques bare a strong correlation to the methods of infamous acting teacher, Konstantin Stanislavski. Doyen’s concepts and reasons for using the cinematograph add to the theatricality of his films.

**SURGICAL FRAGMENTATION**

In Separation of Siamese Twins (1902) the only remaining frames in existence show the very end of the operation. Doyen is seen on the left positioned in a way as to make it the most clear what he is doing with his hands, the patients are barely recognizable as human subjects. Extremely thin and frail legs dangle over the edge of the operating table with a small white cloth covering their pelvis. The cloth serves to only divide their bodies further
into fragmented pieces. After the twins have been separated, the 2nd twin is rushed onto the operating table, her entire body seen by the viewer. It is only in these last moments of the surgery that the cloth is placed across her pelvis. This shot of the body as a whole and newly separate entity, is the only moment (in the surviving footage) where the subject becomes human. For a society that was still questioning their own bodies, how they worked, and their functions, for a film to then dissect them into separated parts must have elicited a great deal of horror within the audience. In analyzing Doyen’s visual style as a director, the viewer can also see a very theatrical and presentational film with a very real subject matter.

Doyen’s assistants surround him almost entirely facing the camera (one other assistant is seen from profile). They seem to be arranged much in the way actors would be blocked on a proscenium stage. The role of the audience is a part of this surgery, invited to take part in a close examination of the miraculous possibilities of science. In Ernst Von Bergmann’s *Leg Amputation* (1903) the surgeon and assistants are displayed in front of the camera in a similar fashion. The audience is such a clear participant in this film that upon amputating the patient’s leg, the surgeon is seen making a swift bow to the camera. In doing this he actually acknowledges the audience and also makes the viewer into an audience member rather than a medical student. The gesture of the bow is a typical ritual from live performance that would not be part of a medical procedure. He also puts himself in the role of a performer by acting as if he has done something that requires applause. These moments of surgical “performance” give the film a theatrical edge that undoubtedly inspired the work of directors like Tod Browning.

By bowing, this surgeon (perhaps Bergmann himself although no information could be found on him) creates the theatrical environment in a film made for instructing medical students on amputation. He also makes light of a very serious procedure and adds to the societal view of the medical world as something to be frightened of. There is a disturbing quality to the surgeon’s jovial nature when removing a human being’s limb. Taken out of context this film could easily be inter-spliced into a classic horror genre film (like Dr. Jekyll and Mr. Hyde) without any noticeable difference. It is this unabashed nature of early scientific films, which created the many of the dimensions of the horror genre. These images, if shown to the general public would insight fear and terror. The fact that they were shown
outside of medical circles ensures us that they would have given the wrong kind of impression to the public about the medical world.

**The Medical and Performing “Other”**

At the turn-of-the-century it was not merely the deformed human body that relegated an individual to the employ of a circus freak show. In the case of Doodica and Radica Neik (the Siamese twin circus performers that Dr. Doyen separated), they were also desirable because of their race. Circuses and carnivals sought out performers that had both physical abnormalities and unusual ethnic origin. Performers from Asia, Africa, and any other distant country provided an added exotic quality for audiences. These differences also provided a further separation from the audience. A European or American audience (of primarily Caucasian people) could then view the show as something exciting and unusual, but at the same time, convince themselves that people with these deformities could not exist in their own hometown.

“Freak shows,” or the exploitation of human strangeness, was a theatrical performance grounded in the disguise of the (mostly) nonwhite subject. Blacks acted out aboriginal roles often being represented as “missing links”; Native Americans performed rituals and dances that confirmed their primordial type; and Gypsies and Bohemians (usually women) were represented as lusty, exotic beauties. The “freaks” would perform according to their public roles: sartorial significations suggested their foreignness, and their stage presence would correspond to stereotypical roles—Native Americans would whoop and chant, “savage” blacks would grunt, and Asians would affect a demure and sedate demeanor. (Fretz 101-02)

This idea of “otherness” both in race and physical abnormalities also extends into the profession of the circus performer. The performer is seen on the outskirts of society, not sharing the same qualities that proper society members did (Dennett 318).

Victorian society was such a regimented one that many people (even in more respected professions) did not fit into a common role. The profession of the doctor at this period in history also exhibited some of the qualities of the other. Many careers within science and medicine were misunderstood and therefore considered frightening. While their profession was respected it also held a forbidden quality, often associated with disease and death. Doctors were typically called upon to give life when birthing a baby, diagnosing illnesses (of which there were few remedies), and pronouncing the death of an individual. Dr. Doyen held even further attributes that classified him as an “other.” Within his own
community of doctors he was scoffed at for placing importance on filming his surgeries, performing them with speed, and his own outspoken beliefs. When his *Separation of Siamese Twins* film was seen at carnivals, it did nothing to help his reputation amongst fellow surgeons.

In 1902 Doyen filmed the separation of female Siamese twins, which raised further outcries. One doctor wrote to *La Tribune medicale* (9 April 1902) asking for the immediate setting up of an order of doctors ‘for the safeguarding of the dignity of the profession’, which had been offended by the commercialism of men such as Doyen. According to the writer, the surgeon had dared to show his Siamese twin film in a fairground under a banner bearing his name (Tosi 168).

While Doyen’s intentions in showing his films at carnivals and circuses remains debatable into the modern day, the fact that they were shown and made a part of the performance of the “other” is worth exploring. Had it not been for his films association with theatrical presentations, there would certainly be even less information written about Dr. Doyen and his work with the cinematograph. There has also been a recent recovery and restoration of some of Doyen’s films at the Cinemateca Portuguesa (Baptista). Despite Doyen’s intentions about specifically screening his films at circuses, he would undoubtedly approve of the attention and audience that was drawn from these screenings.

**A New Kind of Audience**

Doyen’s films gained a more widespread and diverse audience from their theatrical presentations. Looking at the intentions behind the production of a medical film, they are most commonly made for educational purposes, yet when they are shown and viewed in an entertainment environment they can be viewed from a different perspective. It is this intersecting line between scientific film as a teaching tool and as a form of entertainment that many early horror directors straddled. Screenings of scientific film to the general public that did not have medical backgrounds or even the commentary that Doyen scripted for his films, would certainly lead to varied reactions. Misunderstandings about surgical procedures or the human body’s functions could psychologically lead to fear of any scientific or medical imagery or theme. This type of exposure and infiltration of scientific film into the world of popular entertainment created a unique kind of influence within the realm of the genre.
Hollywood’s Fragmentation & Fright

In 1920s Hollywood, director Tod Browning also sought to teach, affect, and frighten his audience through the use of film. *The Unknown* capitalizes on societal fears of the deformed human body. Lon Chaney’s character is Alonzo, a circus performer who pretends to have no arms in order to hide his deformed hand and therefore his criminal identity. He strangles the owner of the circus and could only be found guilty through the recognition of his deformity. It is also this deformity that causes Alonzo to force a doctor to have his arms surgically removed (thus also removing the evidence of his crime and the hands that committed it). Viewing *The Unknown* from a modern perspective many critics attribute the story (which Browning created) to the association of evil with deformity. Upon closer examination there is a great deal more associated with the deformed human body in this film. Rather than the horror being based upon the deformity of the body alone, the horrific moments are found in the incomplete or excessive human body. The body that does not fit into the norms of society (including deformity, the flayed body of surgeries, and the excessive body) is the basis for the terrifying scenes and moments in the film.

Hioni Karamanos argues that Browning presents the disabled with a fetishist gaze, fascinated by the body’s capabilities in both limit and excess. Browning uses assumptions about his audience and their fascination for wanting to understand bodies different from their own to create suspense and horror.

Removing Alonzo’s costume requires taking off several layers of clothing and unfastening a complex leather corset. This forces the camera to linger on his body long enough to suitably impress-and titillate-the curious audience. Instead of exposing Alonzo’s pseudo-disability like a pratfall, Browning presents it more like a striptease. The audience catches a private glimpse of him and must share in the suspense and torment brought on by his trickery. (44)

This reveal of Alonzo’s normality is filmed as if the audience might discover a horrific deformity in the person, his arms are revealed as something frightening and disturbing to the viewer. The camera definitely acts as a voyeur wondering what lies underneath Alonzo’s clothing and undergarments. Much as an audience for a turn-of-the-century freak show at a circus would watch the deformed subjects with a fascination and curiosity, the viewer discovers that Alonzo does indeed have arms. Subsequently it is discovered that Alonzo is also in excess of appendages, sporting two thumbs on one hand. This over-abundance of
thumbs pushes Alonzo once again into the realm of the “other” but this time into an “excessive body” rather than a “limited body.”

His body is also excessive in that his feet and legs are capable of all the tasks that are usually associated with arms and hands. He is seen drinking and eating with his feet, throwing knives, and wiping the sweat from his brow. Chaney’s excess of “arms” in *The Unknown* recalls the theoretical fragmentation of the twins in Doyen’s film. Their four small legs, seen on one side of the cloth covering them, look like an excess of human limbs. He is found to have not only the necessary body, but in fact more than is necessary, classifying him in an uber or super human way.

But Lon Chaney’s somatic scenarios combine a selectivity in the choice of organs with an emphasis on defects and excess. In *The Unknown*, the most drastic film in this regard, the body sometimes lacks arms, sometimes displays too many of them (since the legs act as arms and Alonzo mechanically wipes his face or lifts his glass with a foot), sometimes allows them to proliferate as unlikely growths (he has two thumbs on his left hand). (Brenez 100)

The themes of a limited or excessive body go beyond the character of Alonzo in *The Unknown*. Alonzo is also discovered to love Nanon (the circus leader’s daughter) who has a fear of men’s hands. She, like the audience at the opening of the film, is tricked into believing Alonzo has no hands or arms. For this reason she is comfortable with Alonzo, she finds him void of the ability to grasp and paw at her (it is the action that has caused her fear).

Linda Williams identifies the female leading lady in the horror genre as sharing a kind of sympathy with the “monster.” Using Williams’ analysis, Nanon sympathizes with Alonzo because they share the same role as an object of fascination to men.

The female look- a look given preeminent position in the horror film-shares the male fear of the monster’s freakishness, but also recognizes the sense in which this freakishness is similar to her own difference. For she too has been constituted as an exhibitionist-object by the desiring look of the male. (Williams 87-88)

Nanon can empathize with Alonzo’s objectification and yet is totally unthreatened by his masculinity due to his disability. Nanon’s deep dislike of men’s hands even keeps her from the man that she loves (Malabar, the circus strongman). She likes him from afar until he becomes the disembodied hands that she fears. He tries to woo her using his own body, “Eyes that adore you… hands that long to caress you…and strength to protect you.” Nanon is repelled by this display of the fragmented body. She passionately says, “Hands, Men’s hands! How I hate them!” and later “Men! The beasts! God would show wisdom if he took
the hands from all of them!” Malabar, as a strongman not only has hands but highly skilled strong hands (much like Alonzo’s secret hands). These skills that separate men from animals are part of what Nanon fears. She also fears the traits that go along with these fears, she associates sexual abuse and patriarchal power with men’s hands.

Mankind’s opposable thumbs, which separate the human from the animal are capable of intricate work. Nanon associates men with beasts and yet calls to God to remove their hands (which makes them incomplete or disabled versions of men). The traits that separate man and animal frighten her. The association of evolutionary advancement with fear can be found throughout the narrative of the film. Much in the way Mary Shelley’s Frankenstein warned Victorian society about the human being’s capabilities, Nanon fears what a man could do with a combination of body and mind. Nanon’s feelings echo the Victorian era, even today parts of society oppose the theories of evolution and the advances of science. Nanon’s fear of the rapidly evolving male is also in turn a fear of her own female subjugation and the dominance of the advanced male over her as an object of desire.

Nanon serves as a representation of these old-fashioned ideals, resisting the strong man with his gentleman’s moustache and turning instead toward the disabled and seemingly harmless Alonzo for comfort. Ironically it is in Alonzo that the most danger lies and the most excessive physical body exists. Also, it ends up being the complete and whole human body that forces Nanon and Malabar together. As Nanon trips walking down a series of stairs, Malabar lifts her into his arms saving her from peril. It is at this moment, when Malabar’s arms save Nanon that she falls in love with him. The hands that she has been afraid of throughout the narrative then serve to be Nanon’s salvation. It is only through her own fear that she ultimately finds love and happiness.

While the Separation of Siamese Twins undoubtedly shaped the plot and narrative of The Unknown, its influence can also be seen in the scenes and presentation of the doctor in the film. The most critical and shocking scene in the film involves Alonzo’s dealings with a surgeon whom he blackmails to surgically remove his arms. The heavy content of the scene and Lon Chaney’s incredible acting ability make it all the more gruesome. Alonzo and Cojo (his friend and assistant) approach the operating theatre wearing black cloaks and hats that completely disguise their bodies, becoming shapeless and inhuman in their approach. Much like the patients in Doyen’s films they lose their human qualities, serving more as objects
than people. The operating theatre in the film is definitely portrayed as a theatre and not a room. As the doctor stands reading Alonzo’s blackmailing letter, a stark white room surrounds him. Dozens of bleachers with chairs look down upon the operating area, giving a vast feeling to the space. The room is lit harshly, adding an eerie glow to the surgical tools and instruments.

The relationship of the doctor and Alonzo is never made clear. It is just known that the doctor had a mysterious past that Alonzo uses to blackmail him with. This adds to the mysterious image of the doctor, and associates him with an individual already classified as an “other.” The operating room is surreal and futuristic and the impression is that it is inaccessible to an average person. Browning certainly chose to portray the medical environment as something eerie and something that the general public would find frightening. The room bares a strong resemblance to the operating rooms used in Doyen’s films; sterile, eerie, and surreal. In Doyen’s time it must have given the public a very frightening understanding of an operation. In Browning’s time he used this public impression of the world of medicine as a means to emphasize the horror of his narrative.

Since Doyen designed his room specifically for performing operations, it could be viewed as a kind of constructed set for his films.

The films were shot in a room in Doyen’s clinic that was specifically furnished for the purpose. The walls, for instance, were covered with special paint to prevent unintended light reflection, and, in addition to the room’s natural light source, four electric lamps assured sufficient lighting for both surgeons and cameras. (Van Dijck 27)

In the scenes following Alonzo’s surgery, he appears to be in a hospital recovering. The room is completely bare and white, with a window casting a shadow in the shape of bars over his recovery bed. These scenes are inter-spliced with those of Nanon and Malabar in a loving embrace, shot through muslin they appear earthy and warm; the polar opposite of those taking place in the hospital. When Alonzo is released (and in every subsequent scene), he is again dressed in the long black cape making him seem even more inhuman but now both internally and externally. The final scenes of the film take place in an actual theatre. Alonzo enters the theatre to find Nanon standing on a proscenium stage. He enters through the audience and crossing up onto the stage. By crossing onto the stage Alonzo bridges the world of the performer, the audience and society with the “other”. Alonzo, now on the stage has
become the fragmented human body and is incapable of returning to the whole (having undergone the surgery).

**The Implications of the Happy Ending**

At the film’s final climax, Alonzo makes an effort to sabotage the new act that Malabar and Nanon have created. When his sabotage goes awry he is trampled to death by a horse, killed by the limbs of another living being. As is typical for the Hollywood films of the time, it ends on a romantic embrace between Malabar and Nanon. The final title reads, “So…for Alonzo there was an end to Hate called Death…and for Nanon, an end to Hate…called Love.” Nanon overcomes her fears of the human body and finds love as a consequence of this triumph. This happy and romantic ending seem to imply to the audience that they too may find a great deal of happiness over a greater understanding of their own forms. Browning’s own past working in the circus and gaining a greater understanding about the power and limits of the human body must have given him a knowledge and empathy for the world of the “other.” With the closing of this film he seeks to tell his audience that knowledge and understanding of the body (despite its physical differences) can alleviate the fear that comes from misunderstanding. Despite this message, the representation of “otherness” is made non-existent by the end of the film. This eradication of the “otherness” seems to imply that the “other” and the heroine find peace in their separation. Browning’s message of understanding also calls for a separation of the general public from the “other.” It is only in this separation that the happy ending of the film can take place.

**DOYEN & BROWNING COME TOGETHER**

The narrative content of *The Unknown* as well as the direct interpretation of scenes that address the role of a doctor and the world of medicine, show a great influence from the Victorian surgery films of doctors such as E.L. Doyen. Browning’s use of the audience’s lack of information about their own bodies translates into his film in a way that makes the body terrifying both to Nanon and to the audience. In the film’s conclusion however, Browning reflects society upon itself, challenging the viewer’s misconception about the body. The ending message seeking an understanding for the “other” from the public also shows that it is only in the “other’s” separation from society that everyone finds happiness.
In examining specifically Doyen’s *Separation of Siamese Twins* film, the contextual ideas and history of Doyen’s own beliefs and intentions coupled with the reality of screenings and popularity in a theatrical environment intrinsically tie Doyen and Browning together. Looking at both of these specific films one cannot help but wonder if Browning might have seen Doyen’s film in his early days as a circus performer. Even without this assumption of direct influence, these two films bear the same societal and cultural resonances in relation to medical film. *The Unknown*, as a pre-cursor to the modern horror film, uses the turn-of-the-century fears still a part of society to insight fear in its audience. *The Unknown* uses the interactions between “normal” human beings and those on the outskirts of society to explain the fears of society. In both Doyen and Browning’s films, the people onscreen and their audiences, found horror, beauty, and intrigue within their physical forms. Yet in *The Unknown*’s conclusion Browning questions society’s misunderstandings and urges a greater comprehension of the physical form, while urging a separate but equal way of living. In modern society, the human body continues to be both an aspect of tremendous fascination and fear to human beings themselves. The body concept that Browning urges also is in direct line with the intentionality of Doyen’s films, to educate. This education is key to both a successful procedure (as in Doyen’s films) and a happy emotional life (as in the final moments of *The Unknown*). The way that the body was filmed and screened to people during the turn-of-the-century influenced their society. The influences of early surgical film helped to shape the fears that were and continue to be an important element of the horror genre.
CHAPTER 3

THE OUT OF CONTROL BODY: THE SCIENTIFIC GAZE AND A SYMPHONY OF HORROR

The influence of early scientific films on the development of the horror genre is apparent in one of the first horror films, *Nosferatu* (1922). Adapted from Bram Stoker’s novel, *Dracula*, *Nosferatu* incorporates different fears that had been breeding in European society since the publication of the novel. *Nosferatu* uses photographic techniques that show evidence of the influence of early biological study films (made by directors like Jean Comandon). The themes of fear in the narrative originate with the unknown, that which was most frightening to European society during the 1920s.

Repeatedly throughout the story the characters fear nature, animals, weather, science, and not least of all their own human form. In the neurological films of Walter Greenough Chase, his examination and fascination with the out-of-control human body shows this inherent self-fear and its effect on the horror genre. *Nosferatu* mixes realistic, scientific-based scenes with fantastical ideas to create a shocking and terrifying experience for the audience. The narrative is made more realistic and thus more horrific through the integration of scientific scenes and imagery.

**Stoker’s Dracula and Darwin in Context**

When Bram Stoker published his novel version of *Dracula* in 1897, European and American society was on the brink of many scientific discoveries, yet the public was still caught up in the romanticism of the late 18th and earlier part of the 19th century. This proved a difficult leap for people to change from the romantic to the practical and scientific mindset.

Like everyone else, the early Victorian scientists were affected by the Romanticism that polarized the outlook of that generation. Reading their ‘life and letters,’ one is struck by the stress they placed on the cultivation of their imaginative powers and the importance they accorded to emotion. (Schweber 18)
Characterizing the era, gothic literature has an over-abundance of adjectives and highly emotional characters. There is never a question of the reader being unclear on what they should be feeling while reading. Stoker himself was prolific in his use of exclamation points (Farson 98). The use of expressive punctuation is one way that gothic writers could express their emotional voice to the reader.

In 1859, Charles Darwin also published *The Origin of the Species* and upset the romanticism of the earlier part of the era. Many Victorians longed to escape the realities of the rapid changes occurring around them during the Industrial Revolution and therefore sought escapism in their art and music. While many people grew up in rural areas and were familiar with breeding animals and plants into different forms, there remained a great deal of people who opposed Darwin’s theories. This rift in society created a debate later in the 1920s at trials like the Scopes’ monkey trial, and continues into the modern day (in certain parts of society). Darwin’s theories made many fearful of their surroundings. This new view of nature was much more vast and left more in the realm of the unknown. The human being made up only one tiny part of an extended landscape in a post-Darwinian world. James Paradis uses the following quote by Alexander Von Humboldt’s to introduce his essay “Darwin and Landscape.”

> In the ancient world, nations, and the distinctions of their civilization, formed the principal figures on the canvass; in the new, man and his productions almost disappear amid the stupendous display of wild and gigantic nature. (qtd. in Paradis 85)

Paradis goes on to discuss the pre-Darwinian world that focused around man at the center of the universe, without care that they were only one being in a vast landscape. After Darwin’s publication many were left feeling insecure and unsure of their reason for existence.

For many people, their entire belief system had been shattered and they were left with a fear of their own bodies and the natural world. They saw nature as large and all encompassing, and it was frightening to imagine their own bodies as insignificant and small within this new picture of the world. Even Darwin himself had trouble escaping the romanticism of the era. James Paradis examines this shift of the romantic to the practical Darwin in his personal and public writing over a period of years in his essay, “Darwin and Landscape.” I mention Darwin’s personal change within his own literary style to demonstrate how great an impact the release of *Origin of the Species* made on society at this point in
history. It was into this tumultuous world where nothing was certain that the motion picture was introduced.

**Pioneers in Scientific Cinematography**

One of the pioneers and arguably the inventors of the motion picture camera was Auguste Lumière. While much has been written about Lumière’s tremendous contributions to the artistic world, in contrast very little has been written about his contributions to science and medicine. Virgilio Tosi argues in his book *Cinema Before Cinema: The Origins of Scientific Cinematography* that it was in fact science and medicine that increased the need for the motion picture camera to be developed.1 Lisa Cartwright notes in *Screening the Body: Tracing Medicine’s Visual Culture*, that in the files of the New York Academy of Medicine an obituary for Auguste Lumière appears.1 In this obituary they discuss his work in medical research, specifically tuberculosis and cancer, and mention little of his influence in developing popular entertainment culture. By the time of the publication of Darwin’s *Origin of the Species* the industrial revolution was well underway in Great Britain and France with America soon following suit (Teich and Porter). Economies had shifted from agriculture to industry and with the shift came an increase in inventions with the goal of making people’s work more efficient and cost-effective. Into this environment the pioneers of cinema enter, but before Lumière and Edison were the great pioneers of motion study, Etienne-Jules Marey and Eadweard Muybridge.

Before the motion picture camera was invented, the physiology of humans and animals was extensively studied through motion study photography in the latter part of the 19th century. Eadweard Muybridge was born in England, but left for America in his early twenties to seek his fortune (Tosi 41). Despite a colorful past, which included a stint in prison after being convicted of murder, Muybridge was commissioned by a wealthy friend to take up the study of the movement of horses. He captured the horses’ physiology by taking a series of pictures that showed each precise movement that made up a gallop. The governor of California, Leland Stanford, and his wife continued funding Muybridge’s work, as part of an investment in understanding an animal that was so integral to life at the turn-of-the-century.

Marey was educated in France as a student of medicine, publishing works on cardiology and blood circulation (Braun). He opened the Institute Marey upon graduating in
order to research his physiological work properly (during this time in history physiology was a relatively new field of study). At his institute Marey not only created series of photographic images that studied the movement of humans and animals, but also invented many of the mechanisms and machines that captured how living things moved. These machines certainly had an impact on science and technology, but also on the arts, and especially the motion picture. Understanding the physiology of humans and animals has lead to the variations of character difference in a film (how a character’s posture and stature tells the audience their intentions), our own understanding of how our movement can contribute to pain and illness, and countless other scientific and artistic findings (Pearson).

Following the years of Marey and Muybridge, in the world of science and medicine, studies were being done with the assistance of the motion picture camera. Many doctors and scientists observed disorders in both mental and physical forms and in order to examine and study these phenomena they captured their patients’ disorders on film. In this way they could observe symptoms such as epileptic fits, watching closely how the musculature of the body became tense suddenly and convulsed in a manner far out of the control of the patient.

**THE BODY OUT OF CONTROL**

Walter Greenough Chase filmed 21 epileptic seizures with the assistance of William Spratling, during the turn-of-the-century. Lisa Cartwright describes these films as “a useful text for a reading of the gaze in turn-of-the-century U.S. neurology” (56). In studying early neurological films, Lisa Cartwright describes her purpose in terms of psychoanalytical impact as well as this “neurological gaze.”

I focus on neurology for another important reason: it is impossible to discuss films produced in neurology during the first half of this century without raising questions about scientific spectatorship, visual pleasure, and cinematic surveillance. Neurologists clearly were fascinated by images of the body out of control. (48)

There could be a variety of reasoning behind this fascination with the out-of-control body, but fascination and fear are closely linked. An obsession with an individual’s lack of control can be seen also in the audience of the horror genre. The viewer observes a human body with less human qualities, becoming predatory and then animalistic in the cases of monsters like Nosferatu, Jeckyl and Hyde, and Frankenstein. These monsters all first appear in literature at
the end of the 19th century, just preceding the neurological study films of scientists like Chase.

THE OUT OF CONTROL BODY BECOMES HORRIFIC

In 1922 F.W. Murnau released *Nosferatu*. It is his use of fantastical scenery combined with realistic elements that makes the film visually artistic and also frighteningly believable. Murnau was one of the pioneers of the German Expressionist film movement, which often used the director’s artistic interpretation of scenery or characters to imply a certain mood or set a scene.

Béla Belázs, a German film writer of Hungarian descent, wrote in 1924 that it was as if “a chilly draft from doomsday” passed through the scenes of *Nosferatu*. To obtain this effect Murnau and his cameraman, Fritz Arno Wagner, used all kinds of tricks. Strips of negative film presented the Carpathian woods as a maze of ghostlike white trees set against a black sky; shots taken in the ‘one-turn-one-picture’ manner transformed the clerk’s coach into a phantom vehicle uncannily moving along by jerks. The most impressive episode was that in which the spectral ship glided with its terrible freight over phosphorescent waters. (Kracauer 78-79)

The tricks that created Murnau’s most memorable scenes also contributed to the surreal nature of the film. Murnau’s expressionist elements, such as using negative film to create a contrast of the white woods set against a black sky created a more fantastic visual for the audience. Murnau’s visual style takes the viewer out of reality and creates a kind of dark fairytale. When his fantastical imagery is mixed with scientific scenes, it makes the fantastic all the more believable to the viewer.

*Nosferatu* (1922) plays off of the studies of neurological fears of a body out-of-control and the unknown of nature and animals taking control of human beings. The film’s narrative follows the story of Thomas Hutter: a young clerk who is ordered by his boss to travel to the Carpathian mountains and try and sell a house to Count Orlok. Hutter’s boss, Knock is introduced as an evil character. Before the camera shows him, he is introduced with the text, “Also living there was a real estate agent named Knock, the subject of countless rumors. One thing was certain, he paid his people well” and so the audience expects a less than savory character before ever seeing him. The first shot shows him hunched over on a tall stool at a desk, his body crumpled into a small heap, his head bald, his teeth blackened and worn away. He stares at a mysterious piece of paper and laughs menacingly, before asking
Hutter to undertake the journey to the castle of Orlok. Visually he resembles a rodent, a small hunched body with rotten teeth and beady eyes. He then proves his nature by sending Hutter on a dangerous journey with only the goal of a large profit for himself. This equation of the animal/nature with a lack of control leads the narrative to horrific ends and causes the viewer to associate animalistic behavior with fright. As man loses control and relinquishes it to nature the audience must associate nature with evil. Upon Hutter’s arrival at the castle grounds, a carriage driver picks him up and takes him to the castle. The carriage driver is also hunched over, re-calling evolutionary textbooks showing the ape’s slow evolution to the human being. As he drives the carriage to the castle his movement is sped up so fast that the carriage seems in danger of turning over. He is cloaked entirely in black and bares blackened teeth. All of the evil characters in Nosferatu have a physical resemblance to animals and this exhibits the fears of Murnau and the society that views these characters as frightening. All of the evil characters introduced at this point in the narrative also serve as an introduction to Orlok, the villain himself, who exhibits the most primitive and animalistic qualities.

The final and most ominous character introduction is that of Count Orlok himself. He clearly resembles a rat, with long pointed teeth and nose, the fingers on his hands extend long and pointed like claws. His eyes and cheeks are sunken and his entire body is cloaked in black down to the floor. During Hutter’s visit he finds Orlok to be a mysterious character that shows great interest in his accidental wounds and ultimately discovers him sleeping in a coffin. Hutter has been warned about the existence of a supernatural being called Nosferatu that survives by drinking human blood. After these series of ominous discoveries, Hutter assumes that Orlok has embodied this evil character from folklore. His movements are quick and darting, so as to not allow his victims any moment of escape. A great deal has been written about Orlok’s differences from Stoker’s Dracula. In Roy Ashbury’s analysis and examination of the film he compares Orlok to a cockroach, calling to mind the evil of nature within the character.

When he first scents Hutter’s blood, Nosferatu makes quick, darting movements before ‘homing in’ on his victim with hunched concentration. Sometimes he scuttles like a cockroach surprised by the light, or like the ‘chest burster’ in Alien, while at other times he rises up and petrifies those who see him with commanding gestures of his enormous clawed hand. (Ashbury 22)

Ashbury compares Orlok to a cockroach and a leech, both beings low on the evolutionary ladder. These three evil and animalistic character’s resemblance to another species allows for
the same fear of the unknown of nature to surface in the viewer. Max Shreck, the actor that portrays Orlok, along with Murnau, emphasize these animalistic traits. The production team clearly seeks to frighten the viewer by creating a character that straddles the line between man and animal. The fact that society was frightened by these images proves that there was indeed a fear of nature and evolution.

Many ominous occurrences happen in Hutter’s hometown of Wisborg, Germany as Orlok travels across the sea to inhabit his newly purchased home. One such occurrence is Lock’s descent into insanity. He senses the arrival of evil (Orlok), and begins to hallucinate and fixate on evil. Sensing the nearness of evil, Lock goes mad and at one point fixates on spiders spinning a web, brightly lit as if under a microscope. The spider is a clear representation of evil, those dark parts of nature, that of which little was known. Insects are often used as a representation of something frightening and unknown. Spiders are usually found in shadows or dark corners where they cannot be seen outright. There is also clear association with the rat, an animal that was often associated with plague and the spread of disease. As Orlok’s physicality has so many associations with a rodent, it seems only appropriate the town assumes it is a plague that spreads throughout the town with Orlok’s arrival, and that rats and dirt fill the empty coffins, which transport him on the ship. Stoker himself seemed to have a personal disgust for rats, which he wrote about in two of his gothic short stories. In “A Judge’s House” his fear of rats and insects is obvious.

‘I’ll tell you what it is, sir,’ she said; ‘bogies is all kinds and sorts of things—except bogies! Rats and mice, and beetles; and creaky doors, and loose slates, and broken panes, and stiff drawer handles, that stay out when you pull them and then fall down in the middle of the night. Look at the wainscot of the room! It is old—hundreds of years old! Do you think there’s no rats and beetles there! And do you imagine, sir, that you won’t see none of them? Rats is bogies, I tell you, and bogies is rats; and don’t you get to think anything else!’ (Farson 98)

The fear of rodents and insects coming from their disease-carrying roots would have undoubtedly been heightened by such passages in the literature of the era. This fear was also very clearly translated into Nosferatu, through the representation of rodent-like qualities in the characters, the use of rats in the transported coffins, and the assumption of the spread of plague in the town of Wisborg. These relations to animals and insects show a body out of control that has been engulfed by nature. Relating back to the fears of society at the time, the evolved human body in Nosferatu uncontrollably submits to disease. People’s
misunderstanding about the origination and spread of disease at the time would have increased their fears surrounding it. A parallel can also be drawn between the fear and the fascination of early photographic studies of the out of control body and the societal fears that fanned the flames of misconception about nature.

Victorian fear and fascination did not stop with insects and rodents, but also extended to other beings. In his story, aptly titled “The Burial of the Rats,” Stoker introduces another common household animal as a sinister character, that of the black cat. In a seemingly innocent moment, a child endeavors to play a trick on a cat playing with her kitten and accidentally smashes the kitten’s skull, the mother cat glaring at them “…Her green eyes blazed with lurid fire…”(Farson 101). There was clearly a Victorian fascination with household animals, and a fear for what we (as their masters) could not control in them. Osvaldo Polimanti’s Studies on a Neuro-Motor System (1905-1908) examine a dog’s locomotion after surgery, using photographic images to see how an animal is affected by medicine, and would in turn inform us about our own bodies. These filmmakers’ examinations of animal motion show the fascination with the physiology of animals at this time. These examinations of animals were not only a means to understand the unknown but also a means to fix the human in the role of dominant and most evolved species. For evolutionists, animals also represented a less-evolved human, a simplified version of the human race with a primitiveness that Victorian society lacked. In a way the animal posed a threat to the 20th century human, a threat that could be easily controlled by the domination of their species by human beings.

**THE INFLUENCE OF WEIMAR, BRECHT, AND GERMAN EXPRESSIONISM**

In 1922, with the release of *Nosferatu* in Germany, the Weimar republic had come to power. Its liberal democracy brought about hyperinflation as well as a vibrant artistic movement in the cabarets and nightclubs of Berlin (Bullivant). The Epic theatre of Brecht, German Expressionism, and cabaret music were becoming popular at this time. The properness of the Victorian-era was threatened by the new free-spirited moral abandon following WWI. Yet the romanticism of the 19th Century was also abandoned, causing a hyper-liberalism that led to less emotional art, focusing instead on a new kind of art that was
detached from its creator. Paul Bekker writes in his essay “Improvisation und Reproduktion” in 1922, the same release year of Nosferatu of this new kind of art in Germany.

If such a decline is not to be attributed to a general impoverishment of talent- and if the artistic demands of the music have not changed, yet the attainments of the art of performing music have clearly diminished, there can be only one explanation: namely, that the attitude the present age has towards the artworks themselves, forces the performing artist to emphasize his physical talents at the cost of his humanity. (Hill 56)

As Bekker shows, it was not necessarily a different kind of art being produced but instead a different need from the audience and how they wanted to be involved in the reception of the art. The audience sought a detachment from the artist that was not wound up in the emotions involved in the creation of a work of art. While Bekker’s critique focuses on the music of the time, the same critique could be applied to any of the artwork of the Weimar Republic. In comparison to the romantic, emotional art of the Victorian era, this art separated itself from the viewer. Brecht’s epic theatre was performed in a presentational style, the characters often speaking directly to the audience about deeply emotional occurrences, yet never physically showing that emotion (Brecht). This new art however did not lack emotion; it instead filtered it into specific moments (in Brecht’s case into the songs). The art of the Weimar Republic reflected emotion in a controlled and forced manner, requiring more of the audience in terms of interpretation and thought. Many feared this new demand of the audience and were frightened and confused as to how they were supposed to react to it. Art no longer informed the viewer in a clear-cut manner what their reaction should be. It instead asked a great deal more of its audience; it was up to the individual what type of emotion (or lack thereof) they should feel.

Into this cultural and artistic turmoil the horror genre was born with the release of Nosferatu. Linda Williams discusses the horror genre in her essay “Film Bodies: Gender, Genre, and Excess,” and labels it as a “body genre” with “low cultural status” and believes it is made so by the belief that the spectator mimics the emotions on screen.

Rather, what may especially mark these body genres as low is the perception that the body of the spectator is caught up in an almost involuntary mimicry of the emotion or sensation of the body on the screen along with the fact that the body displayed is female. (Williams 4)

Williams identifies the horror genre as becoming a genre with a lower status because of the perception that the audience is informed how to react. This stigma surrounding the genre has
influenced the horror genre’s class structure, but upon viewing *Nosferatu* a much greater demand was placed upon the spectator. The uncertainty and fear running rampant in society created the perfect audience for a monster story whose horror was based on humankind’s fear of what they did not understand. Requiring and demanding more from the viewer, immediately put the audience in an uncomfortable state, allowing for reaction of fear within the individual.


Early scientific director F. Percy Smith also asked his audience for a suspension of disbelief, incorporating scientific scenes with a supernatural narrative. Smith was a British film pioneer producing short films such as *The Balancing Bluebottle* (1908) during the turn-of-the-century. This short film shows a bluebottle fly on its back seemingly juggling a large cork (twice the size of its own body). Smith made a series of similar films in which it appeared to the viewer that the insects were displaying tremendous feats of strength for their tiny bodies. He also experimented with time-lapse photography in *The Birth of A Flower* (1910) to allow scientists and the general public observation of the wonders of nature sped up in order to properly view the process of plant growth. Smith’s films of nature under slightly more fantastical circumstances (like the alteration of time or a manipulation of the specimen) are a precursor to the use of scientific imagery in horror genre films like *Nosferatu*.

During Orlok’s trek across the ocean to inhabit the town of Wisborg, the town’s inhabitants start to act peculiarly. Many contract mental and physical disorders, some being diagnosed as the plague. During one segment Professor Bulwer teaches his students about carnivorous plants, using the Venus flytrap as an example of “nature’s mysterious ways.” As the plant traps a fly closing its fang-like mouth upon it, the professor says, “Like a vampire, is it not?” By relating this plant to a vampire the professor also relates nature to a monster or an evil force. He equates the unknown mysteries of nature with something to be frightened or fearful of. This scene relates both the common European societal fears of the 1920s and the unknown, to horrific things that are associated with the emotion of fear. It is this combination of fears associated with the overabundance of discoveries revolutionizing the world during the early part of the 20th century that contributes to the film’s terrifying nature. *Nosferatu*
articulates these fears of the other/unknown through its use of scientific film images, recalling microcinemographic films and botany-study films.

In a subsequent scene the professor shows his students a sea organism under a microscope that he calls a “polyp with tentacles” he describes it as “transparent, almost ethereal” “but a phantom almost.” Even in his descriptions the professor makes the unknown realm of science something to be frightened of. While organisms and plants bear little resemblance to vampires and phantoms in modern society, to the readers of Stoker’s novel and the 1922 German society of Murnau’s film, very little was known about these parts of nature and science. Visually the images of the polyp are almost exact to the films done by micro-cinematographers at the turn of the century. Jean Comandon was one of the first filmmakers to capture miniscule organisms and plants on film. In Microbes from the Intestine of a Mouse (1909) he uses the dark field microscopy technique, making the background surrounding the specimen completely dark (Porter 140). The specimen is brightly lit with direct light, magnified under a microscope, and photographed with an apparatus designed specifically for micro-cinematography. The polyp and the Venus flytrap images are visually similar to those of Comandon, bringing a documentary or educational style to the generally fantastical narrative of Nosferatu. The storyline of a man living in a distant castle thriving on human blood is made more believable to the audience through the use of these scientific images, thus increasing the horrific aspect for the audience when the unbelievable occurs onscreen.

Nosferatu brings together these fantastical epic elements of art in 1920s Germany with motion study photography during the turn-of-the-century. By incorporating these elements it sets a precedent for the horror genre films to come. Murnau’s use of scientific imagery (even mimicking the techniques used by directors’ of scientific film) to ground his audience in reality sets them up for being scared. It is by placing the viewer in a very real and believable realm that he can create horror out of the most unbelievable circumstances. The elements that make up the horror genre can be traced back to the beginnings of scientific film. The studies and discoveries made during the experimental early period of scientific cinema had a pronounced impact on the horror film genre.
CHAPTER 4

CONCLUSION

In researching early scientific film and early horror genre films, I found that there was indeed a connection between the two. Through studying Victorian culture and society and the impact that scientific film had on this society, I pinpointed many of the horror genre elements that had a hand in creating the genre. The Victorian society’s understanding and misunderstanding of the scientific world, led to societal fears revolving around the inability to control the body. These fears translated into the horror genre and have continued to remain at the core of the modern genre. The out of control human body, the fragmented body, the unknown aspects of nature, and man’s relationship with animals, are all themes that are prevalent in scientific film. These themes have also influenced the early and contemporary horror genre. In the study of audience and film relations, films create reactions and emotions within their audience. From a psychological standpoint, knowing the roots of the horror genre can tell us a great deal about our modern society and the society that created this genre. In terms of film history, understanding the past is key to understanding the future. It is also my intention to inform individuals and organizations of the importance of these early scientific films and promote awareness in regards to their preservation.

One of my purposes in choosing to research this area was to delve into a new and under-represented area of film studies. Choosing this focus however, did pose problems in terms of research and access. Studying early scientific film, I found much of this footage has been lost, disintegrated, and/or is inaccessible. Much of the footage still in existence remains in archives throughout Europe, and is often not made available to the public. Persistence was helpful in overcoming some of these obstacles, and for every archive that is inaccessible there seems to be another one that will do everything in their power not to lose these films in our cultural memory. The Wellcome Film archive in London generously assisted me with their online database and made it possible for me to view some of these early scientific films from overseas.
**CURRENT SCIENTIFIC FILM MANIFESTATIONS**

While my prior research focuses on the early manifestations of scientific film and its influence historically, the scientific film has not disappeared or remained static. The new scientific media is most prevalent in reality television. This new manifestation reaches an incredibly wide audience and appeals to a vast amount of viewers, in such a way that the early scientific film was incapable of. In their anthology of essays, *Understanding Reality TV*, Su Holmes and Deborah Jermyn highlight the position that reality-based television has taken.

Reality TV has rapidly come to occupy a place at the forefront of contemporary television culture- a position from which it seems to ‘speak’ particularly clearly to the ways in which broadcasters are seeking to attract audiences in the multichannel landscape, the ways in which television is harnessing its aesthetic and cultural power and, as an increasingly multimedia experience, the ways in which it resonates so extensively in the cultural sphere. (Holmes and Jermyn 1)

The prominent position that reality-based television has taken in society shows its appeal to the viewer and prevalence within contemporary culture. In the following I have selected two reality programs, both of which show a societal fascination, misunderstanding, and need to know more about the human body. These programs also demonstrate how scientific film is still very much a part of our popular culture and should thus be included in works of contemporary media analysis.

In the UK, channel 4 premiered their series “The Operation: Surgery Live” in May of 2009. The series shows different life-changing surgeries live with a question and answer period from viewers at home. Apart from the audience remaining at home watching these surgeries rather than attending a theatre, the differences between this programming and the early operation films of Dr. Doyen are few. The major discernable difference is the role of the patient. While in Doyen’s films and other early surgical films, the patient remains anonymous and almost in-human in their portrayal, “The Operation: Surgery Live” profiles the patient, their medical history pre and post surgery, and the history of their condition. Knowing more of this identity of the patient ties in the audience in a more definite way, making the viewer concerned with the patient’s well-being and recovery. However, the knowledge of this patient identity also brings up moral and ethical questions. This also makes the viewer truly a voyeur into the world of medicine and the individual lives of the patients.
In the modern media the reality-based series has become one of the most popular types of television. Most series’ in this genre have become a type of hyper-reality, exhibiting characters and narrative based on some aspect of their real lives. Susan Murray and Laurie Ouelette discuss the authentic and constructed nature of reality-based television in *Reality TV-Remaking Television Culture*.

Although reality TV whets our desire for the authentic, much of our engagement with such texts paradoxically hinges on our awareness that what we are watching is constructed and contains “fictional” elements. (Ouellette and Murray 7)

The questions revolving around the television camera crew’s influence over the “reality” they are depicting also leave the viewer wondering how this influence may have shaped their own reactions to the program. The operation series however, has by nature a greater sense of authenticity. It seems impossible for a doctor performing a surgery to insure a happy ending (such as that in a film like *The Unknown*). While certain personal characteristics can be emphasized or altered by editors and producers, the narrative outcome of a surgical procedure cannot be controlled.

The other interesting question that this type of series brings up is the moral/ethical question of its place in popular entertainment. While it certainly satisfies a voyeuristic need to see within the physical human body, what are the rights of the patient and have they been violated? In terms of censorship, if violence must be monitored on mainstream television, how then is a completely flayed human body acceptable for all viewers? In the case of an unsuccessful surgery where the patient dies, how does real human death fit into censorship and its moral place in the field of entertainment? Some of these questions also would have applied to early medical films. Doyen himself did not agree with the screening of his films on fairgrounds, and yet they have become a part of film history, partly due to their inclusion in popular amusement. These questions certainly shape an audience interpretation of these works. Watching with these questions in mind, the viewer takes on the feeling of viewing something that they should not be seeing. Putting the viewer in this kind of position makes the viewer into a voyeur, creating a fine line between pornography and education.

In the US, similar programs exist such as TLC’s “Trauma: Life in the ER.” This program is not live, but follows a number of Emergency Room doctors through one night’s shift at the hospital’s emergency room. While this series lacks the live element, in its close up surgery of trauma victims it is quite graphic. The network’s website has an area dedicated to
the show, in which an ER SIM video game can be found. In the game, the user plays the
doctor and a simulation takes place in which the player must save a variety of patients
suffering from different ailments. In a sense, this game recreates the Victorian Operating
theatre, and Doyen’s method of instructing his students while keeping them one step from the
creator of the procedure. There is also an online forum where users can participate in
everything from questions regarding the television series to comments about procedures and
methods shown. This forum is much like a modern day version of the “audience” at an
operating theatre, it comprises everyone from medical students to citizens with no medical
knowledge whatsoever. These modern representations of the medical film show a great deal
of the earlier influence of early surgical film. The audience’s fascination with the living body
and its functions has not disappeared but simply evolved.

The modern linkage to scientific film goes beyond reality and documentary tv, it can
also be traced to genre film and television. In popular film there are film and television
dramas, which are tied up in a medical narrative, such as “E.R.” or “Gray’s Anatomy.” A
modern representation of the early neurological films of William Greenough Chase can be
found in films as recent as Martin Scorcese’s Shutter Island (2010). This modern
examination of the human psyche and the effect that trauma can have on human life recalls
the study of pathological movement of filmmakers like Albert Londe. The early neurologists
fascinated by the out-of-control human body were also fascinated by the mind and how the
brain communicated physical function to the body. The early pathological and neurological
study films were made during the height of Freud’s popularity. The human subconscious was
so popular that visual studies of it infiltrated its way into the work of many photographers
and filmmakers. In the modern day, television and film producers use the human body as an
educational tool, a novelty, and in order to connect the viewer with the images onscreen. In
the future, there is a great deal of work that should be done revolving around other forms of
Art, television, modern film, and new media that bear the influence of scientific film. In the
area of the scientific gaze and the exploration of its translation into modern media, the
medical television series is undoubtedly the current product of early scientific film.
THE HORROR GENRE’S PARENTAGE

In the previous study I have found a great deal of impact that the early scientific film had on film history. Through the examination of the horror genre and the two case study films chosen, I have traced the roots of the genre into scientific film. I have studied the history and societal issues that affected and shaped both the scientific films of the turn of the century and the early horror genre films of the 1920s. Looking at early scientific film at its place in the timeline of the beginning of film history, I found that many later types of film seemed to construct their identity from the scientific film. Virgilio Tosi has extensively argued over science’s influence on the invention of film in general and using his framework I pursued my research with the perspective that scientific film certainly made up a large part of the early cinema. Although the horror genre was inspired by many different societal and cultural influences, I found that early scientific film played a large part in its development.

It is my hope that future research will be done on the interconnections between science and film. The scientific world has had a profound influence on film history and genre development. My examination of this specific collision between the worlds of science and film has shown the importance of the scientific film within film history and film analysis. The intention and screening contexts of the scientific film have shaped the films themselves as well as the popular film and the horror genre. Society’s fascination and investigation into and around the human body continues in contemporary media and clearly merits a wealth of study from both the scientific and film communities.
WORKS CITED


