IT WORKS LIKE MAGIC: TECHNOLOGY, STAGE MAGIC, & PERFORMANCE

by

JOSHUA KYLE MARSH

(Under the Direction of David Saltz)

ABSTRACT

In an early-modern context, magic was a dangerous topic. Even staged performances retained an element of potency. Toward the beginning of the 20th century, however, magic emerged from the dangerous connotations assigned by pre-modernist cultures and developed into an accepted type of performance. While supernatural aspects of religion have suffered from the inclusion of science and technology, stage magic is instead resilient, adapting to embrace technology rather than deteriorate from it. This dissertation explores how the relationship has fluctuated over the past 200 years, beginning with the initial shift prompted by the scientific revolution and concluding with an examination of the current transformation resulting from a diffusion of advanced technologies. How do audiences' diverse attitudes toward magic respond to evolving technologies and attitudes toward them? I focus on three distinct perception of magic: as a manifestation of supernatural force, as a trick with a rational yet unexplainable solution, and as converging with technological invention and innovation. Performances implying the use of a potent magic take advantage of an audience's desire to believe in supernatural forces and epitomize the beliefs held during the spiritualist and new age movements. Audiences perceiving these supernatural forces are perhaps oblivious to the performance itself, believing completely in

their effectiveness. The trick occupies a middle ground, where audiences experience a performance as magical and yet, despite cynically knowing it's merely a trick, willingly suppress the need for an answer to the puzzle. These quasi-paradoxes both reinforce and deplete magic's potency. Performances with integration of technology both disable and empower magic, disposing of the supernatural component and the forced belief in the trick, yet retaining elements of both. Audiences encountering technology-as-magic bring with them some general knowledge of the performance's methods and therefore have fewer questions concerning agency or scientific plausibility. The intricacies of executing these technologies, however, often remain a mystery. The purpose of this project is to explore each of these three attitudes in depth: to see how they work, to explain them, and to connect them to their contexts.

INDEX WORDS: Theater, Performance, Magic, Magic History, Magic Tricks, Technology, New Media, Reception Theory, Cognitive Science, Film Studies, Occultism, Spiritualism

IT WORKS LIKE MAGIC: TECHNOLOGY, STAGE MAGIC, & PERFORMANCE

by

JOSHUA KYLE MARSH

B.A., The University of Georgia, 2005

M.F.A., The University of Georgia, 2011

A Dissertation Submitted to the Graduate Faculty of the University of Georgia in Partial Fulfillment of the Requirements for the Degree

DOCTOR OF PHILOSOPHY

ATHENS, GEORGIA

2015

IT WORKS LIKE MAGIC: TECHNOLOGY, STAGE MAGIC, & PERFORMANCE

by

JOSHUA KYLE MARSH

Major Professor:	David Saltz
Committee:	Christopher Eaket Christopher Sieving Frances Teague Ronald Bogue

Electronic Version Approved:

Suzanne Barbour
Dean of the Graduate School
The University of Georgia
December 2015

ACKNOWLEDGEMENTS

A very gracious thank you to my committee, Ronald Bogue, Chris Eaket, Chris Sieving, Fran Teague and to my major professor David Saltz. David is a man of many talents. I cannot thank you enough for your guidance and patience, which helped me navigate through coursework, research, productions, and inventions. Fran Teague has always made time to listen to my ramblings, and her advice has shaped the better part of the past seven years of my life; she encouraged me to apply for graduate school, and her suggestion that I read the works of John Dee led to the topic of this dissertation. My thanks to the faculty, staff and fellow students at the Department of Theatre and Film Studies. In particular I wish to thank Mike Hussey and Richard Neupert, for whom I have the deepest respect and greatest admiration. Thank you both for your kindness, your expertise, and your most excellent senses of humor. And to Ron Bogue: thank you for your immense kindness.

To my favorite teachers—my parents—Kyle and Nancy Marsh, thank you for instilling in me the value of education and for inspiring a passion for learning. Jennifer Schottstaedt has been my source of support and sanity over the last seven years. I will spend the next decade returning your kindness and your patience, and I promise to not mention "magic" for at least a month. I must also thank Simon, who patiently slept in my lap while I typed every word.

I did it, Grad. Just like I promised.

TABLE OF CONTENTS

Page

INTRODUCTION

In an early-modern context, magic was a dangerous topic. Even staged performances retained an element of potency. As Andrew Sofer explains, *Dr. Faustus* alarmed its audiences: "*Faustus's* diabolism disturbed its Elizabethan spectators: who could never be sure whether they were watching black magic or a simulacrum of it."[1] Toward the beginning of the 20th century, however, magic lost the connections with dangerous connotations assigned by pre-modernist cultures and developed into an accepted type of performance. While the development of science and technology has diminished the role of the supernatural in religion and heightened its concern with morals and ethics, stage magic is instead resilient, adapting to embrace technology rather than deteriorate from it. This dissertation examines the relationship between magic and technology as it fluctuated over the past 200 years, focusing on audiences' diverse attitudes toward magic and their responses to evolving technologies.

First performed during the Enlightenment, the trick automaton known as "the Turk" helps to frame the scope of this dissertation. Performance of the Turk introduced the automaton as a wonder, a marvel of invention that was capable of challenging opponents from the audience to a game of chess. So named for its Turkish robes and turban, the Turk sat motionless behind a large wooden desk containing a complex assembly of cogs and

---

[1] Andrew Sofer, "How to Do Things with Demons: Conjuring Performatives in Doctor Faustus," *Theatre Journal* 61, no. 1 (2009): 21.

sprockets. The performer then opened doors on the desk to offer spectators a glimpse of the Turk's internal mechanisms and to persuade audiences that these components controlled both the Turk's physical movements, as well as his strategic choices. To the astonishment of the audience—and his opponent, in particular—the Turk not only played games of chess, he usually won them.

Responses varied wildly. Some fled the performance space, convinced that evil spirits possessed the machine.[2] Others, including great minds such as Edgar Allen Poe, created complex diagrams to illustrate how a hidden human accomplice could operate the automaton in secret. Most skeptics considered the notion of an intelligent machine absurd and impossible. One of these skeptics was Charles Babbage, who lost a chess match to the Turk in 1820. Although Babbage recognized that the Turk was a trick, he recognized the potential for machines that performed automated tasks. Babbage's encounter with the Turk inspired his development of the difference engine: one of the earliest precursors to the modern computer.[3]

The responses to performances of the Turk predict three distinct audience attitudes toward magic and technology that occurred throughout the next 200 years. This dissertation examines the relationship between the developing technological age and audiences' perceptions of magic: as a manifestation of supernatural force, as a trick with a

---

[2] Karl Gottlieb Windisch, *Inanimate Reason: Or a Circumstantial Account of That Astonishing Piece of Mechanism* (Pater-Noster-Row, 1784).

[3] Tom Standage, *The Turk: The Life and Times of the Famous Eighteenth-Century Chess-Playing Machine,* (New York: Berkley Publishing Group, 2002), 140-7.

rational yet unexplainable solution, and as converging with technological inventions and innovation.

Context

Although many scholars have written extensively on magic, the majority of these authors focus on a chronological history of stage magic and magicians. Many studies are not works of scholarship, but are instead intended for general audiences, approaching the topic through anecdotes of performers' tricks. Milbourne Christopher's *The Illustrated History of Magic* and James Randi's *Conjuring* both present an encyclopedic collection of the history of stage magic and are useful resources for identifying key performances and associated performers.

The typical historical work focusing on an individual magician—most are biographies of Houdini—pieces together an individual performer's rise to fame. William Kalush's *The Secret Life of Houdini* exhaustively covers the magician's career, but offers no critical assessments of his work and his contribution to magic as an escape artist. Jim Steinmeyer's *The Last Greatest Magician in the World: Howard Thurston versus Houdini* is an atypical example that champions Thurston's work rather than Houdini's, and asserts that Thurston set contemporary standards for performances of magic. Tom Standage's *The Turk* also targets general audiences, but it chronicles the trick automaton, the chess-playing Turk, rather than its creator. By focusing on a specific trick, *The Turk* is a useful text; it provides accounts of audience response across different cultures and several decades.

Many scholarly studies in the field of stage magic touch on topics pertinent to this dissertation, but otherwise differ in scope. Matthew Solomon's *Disappearing Tricks* includes a discussion of magic and film, focusing on stage magic's contribution to films

produced during the era that Gunning terms the "cinema of attractions." His argument distinguishes between "trick films" (using editing tactics to perform impossible feats on film) and "films of tricks" (a magician performing a trick in front of a camera, without altering the footage. While his distinctions are crucial to understanding the notion of trick, particularly as it relates to film, their concern with technology is limited to film. Solomon's work pauses here, in the context of early film history.

Other studies only consider a specific time period, such as Philip Butterworth's *Magic on the Early English Stage,* which provides some examples of audience response but avoids any discussion of that era's technologies. Two texts engage the history of automata: Wendy Beth Hyman's *Automaton in English Renaissance Literature* and Kara Reilly's *Automata and Mimesis on the Stage of Theatre History.* Hyman limits the scope of her work to the 16th and 17th centuries, examining the cultural context and historical significance of these autonomous machines. The early accounts in this text help frame the range of technologies considered in this dissertation. The focus of Hyman's work, however, is a meticulous investigation of audiences' mechanistic worldview. Reilly departs from a limited time period and instead follows the development of the automaton 'rhizomatically,' culminating in its contemporary incarnation as the robot. Reilly argues that the automaton—sometimes metaphorically—functions as a pivotal influence on audiences, to the point of instigating paradigm shifts. While some sections include useful examples of audiences' responses, they stop short of establishing a solid link between the automaton and a paradigm shift.

Nearly every text attempts to define the term "magic." Most separate magic into two categories: a supernatural, potent power and a staged trick. Although these works typically

reject the idea of any real, supernatural forces, Lawrence Haas's "Life Magic and Staged Magic" categorizes the supernatural with the placebo effect, labeling these as examples of Life Magic. Haas argues that some kind of force exists between a mother reassuring her child that "everything will be okay" after an injury, but he leaves the mechanics of this force up to the reader's imagination. Haas does provide a distinction between wonder magic and prestidigitation: the former is concerned with a performance that baffles its audience, the latter is reserved for exhibitions of great skill. This contrast helps to define the realm of the trick and how it connects to concepts of awe.

Simon During's *Modern Enchantments* considers the cultural implications of magic in all forms and, ambitiously, across several centuries. During frequently discusses technology in his second chapter, but does so primarily in order to explain how recent scientific discoveries enabled a particular trick. He provides a similar historical context for scholars of the supernatural such as John Dee to address idiosyncrasies in "white" versus "black" magic, and how the practice of either was—although forbidden—often overlooked if the originating practitioner happened to be a scientist. During's work is crucial to framing my central question concerning audiences' diverse attitudes toward magic in response to evolving technologies. During does not, however, examine the role of the audience nor the relationships forged by developing technologies.

Methodology

Audiences have experienced a diverse spectrum of magic in performance over the past two centuries, including supernatural encounters, fantasy films, and well-dressed conjurers retrieving rabbits from hats. The goal of my research is to construct a genealogy of concepts that traces audiences' perceptions of magic in these performances. I have

modeled the structure of my analysis on Noel Carroll's *Paradoxes of the Heart,* in which he examines horror as a genre and as an emotion. This model is compatible with magic because their territories overlap; Carroll suggests that horror could be considered a subcategory of magic, and that "if horror belongs to the genus of the fantastic-marvelous, it constitutes a distinctive species."[4] I have taken an interdisciplinary approach that borrows from philosophy of science, media theory, sociology, psychology, and cognitive science to develop a clear, succinct, and philosophically rigorous throughline.

My investigation begins by identifying which conditions are necessary for categorizing an event as either scientific or magical. I refer to concepts from philosophy of science to establish these distinctions, namely Karl Popper's notion of falsifiability and Thomas Kuhn's discussion of scientific revolutions that result from paradigm shifts. Psychologists Peter Lamont and Richard Wiseman, both professional stage magicians, provide vital details that explain the structure of magic tricks. To understand how magicians deceive audiences, I turn to neuroscientist Stephen Macknik's taxonomy of magic trick methods, which categorizes methods by cognitive function. My analysis of audiences' relationship with technology primarily draws from Lev Manovich and Henry Jenkins, but is also informed by the work of Marshall McLuhan and Sherry Turkle.

I present case studies throughout the dissertation to explore audiences' attitudes toward both magic and technology. The purpose of these examples is to develop my

---

[4] Noël Carroll, The Philosophy of Horror, or, Paradoxes of the Heart (New York: Routledge, 1990), 16-7.

philosophical and historiographical arguments further, not to contribute to a better understanding of any individual work or performance.

Outline

The first chapter of this dissertation explores credulous audiences and performances that purportedly demonstrate the use of potent magic. Although some performers believe in the authenticity of their abilities and the resulting magic, most take advantage of audiences' desires to believe in supernatural forces. The chapter focuses on the Spiritualist movement to show how audiences perceiving supernatural events are often oblivious to the performance itself, believing that the magic is real.

The second chapter investigates stage magic, a genre of performance that opposes the defrauding of credulous spectators and instead relies on a form of honest deception: the trick. [5]Tricks occupy a middle ground; audiences experience a performance as magical and yet, despite cynically knowing it is merely a trick, willingly suppress the need to solve the puzzle. Tricks are quasi-paradoxes that both reinforce and deplete magic's potency.

The third and fourth chapters consider how the inclusion of technology both disables and empowers performances of magic. Chapter 3 focuses on performances of stage magic that feature technology both on the stage and behind the curtain. These examples depict a disruptive technology which, in most cases, weakens the trick's efficacy. The intricacies of these technologies often remain a mystery, thus preserving some elements of

[5] Not all Spiritualist mediums were con-artists intent on defrauding their audiences. Some genuinely believed in their abilities. In the same sense, not all magicians were honest, either.

magic. Chapter 4 examines performances of technology *as* magic: where the use of technology enables the audience's perception of the supernatural.

The purpose of this project is to explore each of these three attitudes in depth: to see how they work, to explain them, and to connect them to their contexts. Their differences correspond to a varying degree of belief. Performances such as the séance reinforce a genuine belief in the supernatural for many spectators. In contrast to these credulous spectators, audiences described in the second chapter have some general knowledge of stage magic and its secret methods and therefore have fewer doubts concerning agency or scientific plausibility. The trick, however, eliminates these explanations while demonstrating some seemingly impossible feat that challenges the audience's beliefs and generates a sense of awe. The final two chapters explore reactions to scientifically explicable technologies that should preclude any belief in magic, but the technology retains elements of mystery that approach an experience of magic. My research concludes with emerging attitudes that seem to correspond to beliefs held prior to the Enlightenment. Although audiences have no real understanding of how modern electronics function, they expect these devices to perform amazing tasks. We leave the development and maintenance of electronics to experts who deal with hidden complexities much like wizards and sorcerers dealt with matters of the occult, and we experience the simple magic of the technology without engaging its mysterious complexities.

CHAPTER 1

WHAT IS MAGIC?

One evening in 1860, eight or nine people—among them celebrity medium Daniel Dunglas Home and scientific observer Robert Bell—met in a drawing room for a séance. They gathered around a table in the center of the room and waited expectantly. The first instructions came "through the usual channel of correspondence" and, obediently, the company extinguished the lights.[6] Dead silence ensued, punctuated only by the ticking of a watch. Then, in near-complete darkness, the manifestations began.

Those present began to feel the touch of a playful boy's hand leaping under the table from one side to the other. It was followed by a larger man's hand, and when Bell grasped it, he

> felt it very sensibly, but it went out like air in my grasp. I know of no analogy in connection with the sense of touch by which I could make the nature of that feeling intelligible. It was as palpable as any soft substance, velvet, or pulp; and at the touch it seemed solid; but pressure reduced it to air.[7]

An apparently disembodied hand rose, snapped off flowers from geranium stands in a nearby window, and tossed the flowers at the spectators. In a space too narrow for the instrument to fully expand, an accordion began to play of its own volition, rising over the

---

[6] Robert Bell, "Stranger Than Fiction," in *The Cornhill Magazine*, ed. William Makepeace Thackeray (Smith, George, 1860), 221.

[7] Ibid.

edge of the table and sinking back to the floor. Bell held the instrument in one hand as it played, but had difficulty maintaining his grasp on the moving object. During the final moments of spectacle, Home floated through the air:

> He said, in a quiet voice, 'My chair is moving—I am off the ground—don't notice me—talk of something else,' or words to that effect...I was sitting nearly opposite to Mr. Home, and I saw his hands disappear from the table, and his head vanish into the deep shadow beyond. In a moment or two more he spoke again. This time his voice was in the air above our heads. He had risen from his chair to a height of four or five feet from the ground...We watched in profound stillness, and saw his figure pass from one side of the window to the other, feet foremost, lying horizontally in the air.[8]

Home made an undeniable impression on his audience both in the parlor and in popular opinion. Throughout his career he worked to establish an image of professionalism distinct from other mediums of the era. According to his biographer Peter Lamont, Home

> was fairly well-educated and, unlike other mediums, he never accepted payment for his séances...His success, however, relied upon an ability to produce a wide range of seemingly inexplicable phenomena in the séance room without any signs of trickery being involved.[9]

---

[8] Ibid., 223.

[9] Peter Lamont, "Spiritualism and a Mid-Victorian Crisis of Evidence," *The Historical Journal* 47, no. 04 (2004): 889.

Magic during this period was caught in a paradigm shift; the recent and rapid succession of scientific advances that accompanied the industrial revolution had thrown cultural perceptions of the supernatural in flux. These changes were most evident in the rise of Spiritualism, a movement whose leading figures included mediums such as Home.

The Spiritualist movement had unlikely beginnings. Its founders were two sisters—eleven-year-old Kate Fox and fourteen-year-old Maggie Fox—who lived in Hydesville, New York. In March, 1848, inexplicable knocks and rappings originating from an area near the girls' beds began to disturb the Fox family's farmhouse. Suddenly, Kate appeared to be possessed by an entity with a deep voice, and when she clapped her hands, the rappings echoed her. The parents started asking the spirit simple questions, and it responded with rapping sounds to count out numbers or to indicate "yes" (one rap) or "no" (silence).[10]

Frightened and convinced that these were real phenomena, the parents summoned their neighbors who, in turn, brought a number of others to witness the sisters interact with the spirit. As their fame rose, the sisters began to travel through the state, demonstrating their extraordinary abilities as mediums between the physical and spiritual world. Although the séance would later be popularized as a private event held for small audiences, Maggie Fox performed her first public séance in the 1,200 seat Corinthian Hall on 14 November 1849, confirming that large audiences were interested in Spiritualism and its ideas.

---

[10] E. E. Lewis, "A Report of the Mysterious Noises Heard in the House of Mr. John D. Fox, in Hydesville, Arcadia, Wayne County, Authenticated by the Certificates and Confirmed by the Statements of the Citizens of That Place and Vicinity," (Rochester, NY: E.E. Lewis, 1848).

In the wake of the Fox Sisters' success, others claiming similar abilities began conducting invitation-only "home circle" séances in private settings, often held weekly or biweekly.[11] Typically held at the medium's personal residence,[12] the séances developed into a familiar pattern. Canadian doctor and Spiritualist Thomas Glendenning Hamilton, who took thousands of photographs during the séances he attended, describes the events as follows:

> A group of people sit themselves in a dark room. They join hands: after a few minutes one or more of their number passes into a sleep-like state. This is the trance. It [the spirit entity] may display various automatisms, such as writing or visions, or speech. this latter occurs when the medium's own voice is used by a trance personality whose speech habits and voice timbre generally differ quite considerably from those of the medium in a normal waking state.[13]

---

[11] Peter H. Aykroyd, *A History of Ghosts: The True Story of Séances, Mediums, Ghosts, and Ghostbusters* (New York: Rodale, Inc., 2009), 21.

[12] Conducting the séance at the medium's home allowed extensive preparation used to deceive the audience. According to historian Dee Morris, "many houses used in private séances were found to contain hollowed-out walls, sliding panels and the customary trapdoor. The Berry sisters and Hannah Ross were very reluctant to hold séances in unfamiliar settings because the effects could not be easily controlled." See Dee Morris, *Boston in the Golden Age of Spiritualism: Séances, Mediums & Immortality* (Charleston, SC: The History Press, 2014), 20.

[13] T. Glen Hamilton, *Intention and Survival: Psychical Research Studies and the Bearing of Intentional Actions by Trance Personalities on the Problem of Human Survival* (Toronto: The

By 1852, there were more than 2,000 'writing' mediums in the United States; by 1853, "there were more than 30,000 [overall] mediums in the United States alone, and paranormal fever was rapidly spreading to Britain and the continent."[14] The number of Spiritualists was increasing as well, but an exact figure is difficult to calculate. The Spiritualists at the time self-reported memberships numbering as high as eleven million, while the census of 1910 indicated 150,000 claiming to be Spiritualists. Writer and philosopher Joseph McCabe, an early skeptic and critic of Spiritualism, explains that "the [eleven million] figure is ludicrous, but it shows that the movement must have been extraordinarily successful."[15]

Given the rapid pace with which the scientific age introduced new explanations, it seems counterintuitive that the Spiritualist movement would gain momentum during this golden age of knowledge through structured experimentation. The scientific revolution, however, prompted a crisis of faith in many Western cultures. As historian John J. Cerullo explains, public interest in supernatural subjects such as Spiritualism resulted from an "attempt to come to terms with scientific thought while retaining the understanding of the self that religious tradition has transmitted."[16] Darwin's *Origin of Species*, for example,

---

MacMillan Company of Canada, Ltd., 1942), 21-22.

[14] Aykroyd, *A History of Ghosts: The True Story of Séances, Mediums, Ghosts, and Ghostbusters*, 17.

[15] Joseph McCabe, *Spiritualism: A Popular History from 1847* (New York: Dodd, Mead & Company, 1920), 65.

[16] John J. Cerullo, *The Secularization of the Soul: Psychical Research in Modern Britain* (Philadelphia: Institute for the Study of Human Issues, 1982).

posed significant challenges to Christian doctrine by presenting a rational alternative to creationism. As scientists uncovered truths about the natural world and the cosmos, Christianity shifted to an increasingly esoteric doctrine.

> The genuine Christian doctrine of heaven, the theological doctrine, was never in the minds of the uneducated millions of Europe. They really believed in a material heaven : in winged and radiant angels, in the glorified forms of their dead, if not in streets of gold and houses of topaz. The spread of education and criticism in the nineteenth century had a curious effect here. It purified the popular conception of heaven ; it restored its spiritual features ; and to thousands of believers it made heaven less appealing, if not actually insipid.[17]

Spiritualism provided a response to the burden of proof imposed by science, offering evidence of an afterlife. Spectators attending séances could reconnect with loved ones and, according to Georgina Byrne, seek "hidden knowledge and advice for the living dispensed by those lurking in the afterlife."[18] Mediums such as Daniel Dunglas Home and the Fox Sisters presented a much more palatable afterlife, which bore many similarities to the older, medieval, material concept of heaven but carried a suggestion of scientific credibility.

The Fox Sisters and Daniel Douglas Home were, however, frauds—albeit successful ones. After fostering the Spiritualist movement for forty years, Maggie and Kate Fox, now both widowed alcoholics, recanted their claims in 1888 after a drastic family argument,

---

[17] McCabe, *Spiritualism: A Popular History from 1847*, 24-25.

[18] Georgina Byrne, *Modern Spiritualism and the Church of England, 1850-1939*, Studies in Modern British Religious History (Woodbridge, UK: The Boydell Press, 2010), 2.

with Maggie publishing her confession in the newspaper.[19] Similarly, while the Spiritualist community continues to insist on his authenticity, Home made the occasional mistake, such as when he allowed the French General Hubert Rohault de Fleury to leave in the middle of a séance:

> General Fleury, suspecting some conjuring trick, asked leave to withdraw but returned unobserved by another door behind Home: 'He then saw the latter open the sole of his right shoe, leave his naked foot some time on the marble floor, then suddenly with a rapid and extraordinarily agile movement, touch with his toes the hand of the Empress, who started, crying 'The hand of a dead child has touched me!''[20]

Home's spirits were nothing more than parlor-trick deceptions that his audience misinterpreted as supernatural events.

After the 1850s, Spiritualism diminished in popularity, with a short boost in the 1870s whose ebb in the 1880s was not entirely unrelated to Maggie Fox's public confession of forty years of fraud. One of the largest indicators of both Spiritualism's former popularity and fall from grace is Noel Coward's *Blithe Spirit.* The play centers around Charles and Ruth, a couple who hire Madame Arcati, a medium, to perform a séance. They expect her to be a fraud until they find themselves haunted by Charles's first wife, Elvira. The characters deride Spiritualism and mediums throughout the play, and their ridicule is not limited to

---

[19] Amy Lehman, *Victorian Women and the Theatre of Trance: Mediums, Spiritualists and Mesmerists in Performance* (Jefferson, NC: McFarland & Company, Inc., 2009), 87.

[20] John Casey, *After Lives: A Guide to Heaven, Hell, and Purgatory* (New York: Oxford University Press, 2009), 374.

Arcati; they also criticize relatives who pretend to fall into elaborate trances as well as the belief in magic itself. Arcati's powers are entirely dependent on her digestion, such as her inability to perform if she eats cucumber sandwiches after pigeon pie. When Ruth dies and reappears, Madame Arcati proves incapable of banishing either spirit. By now, both are mocking her:

> We have allowed ourselves to be subjected to the most humiliating hocus-pocus for hours and hours without complaining - [...] - We've sat interminably while that tiresome old woman recited extremely unflattering verses at us. We've endured five séances - we've watched her fling herself in and out of trances until we're dizzy and at the end of it all we find ourselves exactly where we are at the beginning.[21]

The spirits are finally banished not by Arcati, but by an inept and awkward housemaid. The play as well as its enthusiastic reception drove another nail into Spiritualism's coffin. *Blithe Spirit* London run was record-breaking, running for 1,997 performances, suggesting that audiences did not take Spiritualism as seriously as earlier generations.

What kind of magic happened in these performances? Magic certainly remained a "real" force for many spectators, and mediums such as Home and the Fox Sisters were some of the most convincing performers of that magic. The scientific revolution, however, presented the first sustained threat to the authenticity of supernatural explanations. From the perspective of science, magic is a fictional force, but what about the spectator's perspective? Do séances merely defraud the audience, or—if the séance can be considered a performance of magic—what kind of magic can the audience experience?

---

[21] Noel Coward, *Three Plays: Blithe Spirit, Hay Fever, Private Lives* (New York: Grove Press, 1979).

A Shifting Concept

As a concept, "magic" resists specificity both in its definition and in the events it describes. A "performance of magic" could refer to an incalculable range of occurrences, from an entertainer at a child's birthday party to religious miracles or medieval sorcery. In the United States, "magicians" perform magic for entertainment, but the same classifications seem awkward to European audiences who—along with most contemporary scholars—prefer "conjurer" and "conjuring" to label performers and performances of the (ostensibly) supernatural on stage. According to Phillip Butterworth, while many audiences around the world are accustomed to the latter usage, '"conjuring,' as a term employed to describe the act of performing magical tricks, was not used in its current sense in England until the nineteenth century."[22] Conjuring referred to a type of abjuration or summoning: calling upon a demon or spirit to fulfill the requests of the summoner. From the twelfth through the seventeenth century, audiences instead labeled magic-for-entertainment as "juggling."

The term's most inclusive definition is as a repository for the impossible. Two common substitutes for magic, "supernatural" and "paranormal," indicate an inherent conflict with reality (above-natural, beyond-normal). Countless subcategories introduce additional nuances that further complicate the criteria for magic. Whether "the supernatural" is an absurd notion or a legitimate explanation—that magic really

---

[22] Philip Butterworth, *Magic on the Early English Stage* (Cambridge, UK: Cambridge University Press, 2005), 2.

happened—varies depending on historical and cultural conditions. Prior to the scientific revolution, however, magic and science were much less distinct.[23]

During the Elizabethan era, magic was considered a legitimate component of scientific inquiry. John Dee, Queen Elizabeth's court sorcerer, served as both a scientific and magical advisor. Dee was one of the best-educated scholars in the world, a gifted mathematician and an inventor of many navigation instruments and astronomical devices. Despite Dee's rigorous scientific training by the standards of his day, his methodology would seem unscientific by modern standards. Dee spent a significant amount of time conducting research into supernatural and occult studies, and shared the Spiritualist's goal of communicating with spirits. With the help of his associate Edward Kelley, Dee conducting séances in an attempt to contact angels. Modern science would certainly reject many of the "discoveries" that came of Dee's research, such as when angels instructed Kelley and Dee to share wives. As historian Keith Thomas explains, however, the animistic view of the universe during Dee's time encouraged a synthesis of science and supernatural,

---

[23] According to the Oxford English Dictionary, “supernatural” appeared as early as 1425, whereas the first appearance of “paranormal” only dates back to 1920. Nearly all entries present “supernatural” in the context of religion. Entries dated from the 1700-1800’s, however, indicate a shift to include definitions describing opposition to nature. See OED Online. September 2015. Oxford University Press. http://www.oed.com.proxygsu-uga1.galileo.usg.edu/view/Entry/194422 (accessed November 09, 2015).

and that "for much of the period...magical inquiry possessed some intellectual respectability."[24]

The public perception of magic during the Elizabethan era matched academic interpretations. Although acts of “juggling” represented a distinct type of entertainment, staged performances nevertheless retained an element of supernatural potency for audiences of this era. The conventions of performance did not invalidate the potential for magic. Productions of *Dr. Faustus* still alarmed audiences, Andrew Sofer explains, because "Faustus's diabolism disturbed its Elizabethan spectators, who could never be sure whether they were watching black magic or a simulacrum of it."[25] The Elizabethan era marks a tipping point, a moment when magic and science were often indistinguishable.

The scientific revolution re-categorized magic by stripping away its dangerous, pre-modern associations with otherworldly power and positioned the supernatural in direct opposition to rationalism. In the absence of rationalist opposition, however, magic is just another source of natural explanations. In a pre-Elizabethan context, the study of magic was inappropriate only in relation to how it was practiced and whether it questioned the authority of the Church. The Church trusted Dee because he was a scholar, and permitted his investigations into supernatural forces as long as they remained within the bounds of Christian doctrine. Those who dabbled in magic but were not "learned men" risked association with demonic forces and were thus susceptible to the evils of the supernatural.

---

[24] Keith Thomas, *Religion and the Decline of Magic: Studies in Popular Beliefs in Sixteenth and Seventeenth Century England* (New York: Charles Scribner's Sons, 1971), 226.

[25] Sofer, "How to Do Things with Demons: Conjuring Performatives in Doctor Faustus," 21.

The Church and the Crown threatened these amateur researchers of magic with excommunication and execution.

For contemporary scholars, "magic" means something altogether different, but the fear of ostracism by one's peers remains a consistent fear. Few serious academics would argue that magic is a real and potent force in our universe.[26] A contemporary definition of magic, then, typically outlines a purely fictional force: a misinterpretation of events that science can explain (or will, in the future). Reactions to Spiritualist séances confirm this shifting attitude toward supernatural agency. Credulous and skeptical spectators alike sought to verify the ostensibly fantastic claims of Spiritualist mediums.

The Seybert Commission was among the most notable investigatory bodies, comprised of ten University of Pennsylvania faculty members. Most were scientists except for Horace Howard Furness, a Shakespearean scholar and the commission's chairman, who initially expressed a favorable stance toward Spiritualism. Over the next three years the commission investigated as many mediums as they could, but found few willing to submit to examination. The subsequent report issued at the conclusion of their inquiries reveals that the scientists themselves were eager to verify the claims of Spiritualism, but none of

---

[26] Exceptions exist, however, such as the University of Edinburgh's Koestler Parapsychology Unit, which offers courses exploring the social and historical significance of the supernatural, some of which present parapsychology as a legitimate field of science. The school's most notable figure in support of paranormal studies is parapsychologist Dr. Caroline Watt. See http://www.ppls.ed.ac.uk/psychology/groups/koestler-parapsychology-unit

the mediums could provide convincing evidence. On examining the phenomenon of slate writing, the commission found that

> There is really no step in the bare process of producing this writing, as we have observed it, which might not be accomplished by trickery or by legerdemain. Of course, therefore, we were sincerely anxious to disprove in these experiments the presence of those discreditable elements, not only for the credit of human nature, but for the sake of the great scientific interest involved. We are perfectly ready to accept any fact of Spiritual power; and so far from flinching from an open avowal of our belief in this revelation of a novel force in Nature, we would welcome it. But no one, not a Spiritualist, we should suppose, can demand of us that we should accept profound mysteries with our eyes tight shut, and our hands fast closed, and with every avenue to our reasoning faculties insurmountably barred. Yet this is precisely what is demanded of us by Mediums in regard to Independent Slate Writing. We must sign a dispensation to forego the exercise of common sense, and accept as 'fact' what they choose so to term.[27]

Despite the commission's favorable bias toward affirming elements of Spiritualism, they observed no magic, no spirits, no supernatural events. On the contrary, their conclusions reinforced the divisions that now excluded magic from the criteria of scientific inquiry. Had the commission found evidence in favor of the supernatural, then science would

---

[27] University of Pennsylvania Seybert Commission for Investigating Modern Spiritualism, "Preliminary Report of the Commission Appointed by the University of Pennsylvania to Investigate Modern Spiritualism, in Accordance with the Request of the Late Henry Seybert," (Philadelphia: J.B. Lippincott Company, 1887).

appropriate the phenomenon as a "novel force in nature," assimilating it into the framework of the rational and verifiable. It would cease to be *super*natural.

The definition of magic thus shifted from an early modern interpretation that lacked distinction from science to a broad and inclusive label for all manner of impossibilities: a direct rival to the rational world. Defining magic as entirely fictional is, however, a narrow interpretation that only addresses the skeptics' beliefs. While the credulous spectator's belief lacks a foundation in science, our definition of magic must account for their perspective, because it is the primary subject of interest. To accommodate both views, I turn to Simon During's *Modern Enchantments*, which undertakes the monumental task of approaching magic of all forms. During proposes the two categories of "secular" and "real" magic. Secular magic refers to contemporary performances of magic in a world saturated by science. Despite appearances, secular magic is an illusion, a trick. During explains that secular magic is

> different from the magic of rituals, myths, and fetishes, as well as that of spirits, universal sympathies and antipathies, or of superstition or credulity. It is a self-consciously illusory magic, carrying a long history, organized around a still-beleaguered lightness or triviality, which it also massively exceeds.[28]

In contrast, real magic is—for those cultural and historical entities that believe in its efficacy—magic that purportedly manifests as a functional and supernatural power. During's interpretation encompasses the full range of magical and skeptical beliefs,

---

[28] Simon During, *Modern Enchantments : The Cultural Power of Secular Magic* (Cambridge, Mass.: Harvard University Press, 2002), 27.

indicating that strict rationalism defines science in terms of empirical evidence, thus excluding magical phenomena that by definition, exist beyond science's ability to explain.

What is Science?

Philosophies of science outline criteria that exclude any notion of "real" magic. Karl Popper's model of falsification, for example, maintains that the key component that separates science from magic and pseudoscience is falsifiability: that is, some possibility of refuting a proposed theory. Popper provides a critique of astrology to demonstrate how falsification rejects non-scientific claims:

> Astrology did not pass the test. Astrologers were greatly impressed, and misled, by what they believed to be confirming evidence—so much so that they were quite unimpressed by any unfavorable evidence. Moreover, by making their interpretations and prophecies sufficiently vague they were able to explain away anything that might have been a refutation of the theory had the theory and the prophesies been more precise. In order to escape falsification they destroyed the testability of their theory.[29]

Many other philosophies of science,—such as Thomas Kuhn's notion of scientific revolutions and paradigm shift, and Paul Thagard's criteria for separating science from pseudoscience—identify another critical requirement: theories in any given field of science change (often dramatically) over time. Through their inherent ambiguity, pseudoscientific and supernatural theories, however, can avoid the need for change and instead remain stagnant.

---

[29] Karl Popper, *Conjectures and Refutations: The Growth of Scientific Knowledge* (London: Routledge Classics, 2014), 48-49.

> Thagard explains how stagnation serves to insulate magical thinking from criticism: The community of practitioners makes little attempt to develop the theory towards solutions of the problems, shows no concern for attempts to evaluate the theory in relation to others, and is selective in considering confirmations and disconfirmations.[30]

Despite scientific evidence that opposes it, contemporary theories of magic remain stagnant because advocates of magical thinking believe that scientific inquiry does not apply to the supernatural. Proponents of both sides fundamentally agree that magic, if it exists, is impossible to explain with science. According to Simon During, close inspection of the supernatural is impossible by definition because

> the magical domain can be radically 'other' to the ordinary life only insofar as it remains unknowable. As soon as we communicate with or represent the Other...it begins to lose its Otherness. It joins the conceptual machinery of this world.[31]

By classifying explanations for unknown phenomena into distinct categories, the differences between a magical and a scientific approach to the supernatural becomes clear:

1. A scientific explanation exists (unknown to the spectator).
2. No explanation exists, but science can discover it.
3. No explanation exists, and science can never discovered it.

---

[30] Paul R. Thagard, "Why Astrology Is a Pseudoscience" (paper presented at the PSA: Proceedings of the Biennial Meeting of the Philosophy of Science Association, 1978 1978), 228.

[31] During, *Modern Enchantments : The Cultural Power of Secular Magic*, 39.

The first condition describes how audiences experience a performance of stage magic, while the second describes scientific research. While most everyone would agree that the first two categories apply to many phenomena, proponents of magical thinking are the only group that accepts the third category as a viable explanation for the unknown.

Pseudoscience such as alchemy and phrenology, which lie somewhere between magical fantasy and scientific rigor, offer insight into the intricacies of magical thinking. Although alchemy laid the groundwork for much of modern chemistry, even its most capable English practitioners, Robert Boyle and Isaac Newton, failed to achieve the "magic" of transmuting base metals into gold. Psychologist and professional stage magician Peter Lamont explains that supernatural beliefs are complex, and that although "belief that paranormal phenomena exist is, by definition, belief in phenomena that are outside current scientific knowledge...that is not necessarily what it means for those whose beliefs we seek to understand."[32] Lamont is not advocating that scientists give full consideration to belief in magic, but he is suggesting that we are quick to dismiss anything that science doesn't have the capacity to explain.

Audiences' reactions to séances demonstrate how both skeptical and credulous spectators misinterpret the role of science. Spiritualists, eager to reinforce their beliefs in an afterlife and communication with spirits, applied notions of science to séances in an effort to lend credibility to their supernatural proceedings, causing many Victorian investigators of Spiritualism to believe "that the erratic phenomena of the séance could be

---

[32] Peter Lamont, *Extraordinary Beliefs: A Historical Approach to a Psychological Problem* (Cambridge, UK: Cambridge University Press, 2013), 16.

reduced to natural laws."[33] For many credulous spectators, the séance provided proof of life after death. Rather than attempt to explain the mechanisms enabling the manifestation of spirits, they instead considered spiritualism to be a "scientific" supernatural event that verified further supernatural beliefs. But science does not work this way. Most of the investigations that purportedly authenticated a medium's powers did so by identifying a lack of fraud or deception, but made few attempts to explain the presence of the spirits themselves.

The Spiritualists were not alone in haphazard and hasty applications of the scientific method. Sir David Brewster, an expert in optics, created a similar quandary when he attempted to discredit Daniel Dunglas Home a few weeks after the medium arrived in London. Brewster did not believe in the supernatural phenomena he supposedly witnessed; however, he had no idea how the effects were actually created. Rather than conduct an experiment, Brewster instead published an inaccurate recollection of events that drew direct contradictions from others who were present at the séance:

> It seems clear that Brewster did not know how to explain what he had seen and, as such a position would no doubt have been embarrassing for the author of *Letters on Natural Magic*, it is not surprising he came up with some conjectures, as he put it, ' for the information of the public '. While many no doubt simply accepted these theories, their shortcomings must have been obvious to any reader with more than a passing interest in the subject, and Brewster's apparent dishonesty made him a target of spiritualists for many years to come. Even *The Spectator*, no defender of

[33] Richard Noakes, "Spiritualism, Science and the Supernatural in Mid-Victorian Britain," *Cambridge Studies In Nineteenth Century Literature and Culture* 42 (2004): 24.

> spiritualism, later admitted that 'on the face of published correspondence, the hero of science does not acquit himself as we would wish or expect.'[34]

Magical healing, a practice found throughout history across various cultures, illustrates the dangers of misinterpreting agency and belief. Faith healers, for example, claim to have the supernatural ability to cure ailments on behalf of a higher power, such as channeling the energy of God to treat cancer. Scientific investigation cannot directly support the faith healer's claims, but this conclusion does not necessarily preclude *any* link between the performed events and cancer remission. In the 1950's, noted anesthesiologist and Harvard Professor Henry Beecher argued that the placebo effect played an important role in experimentation, explaining that "it is evident that placebos have a high degree of therapeutic effectiveness in treating subjective responses, decided improvement, interpreted under the unknown technique as a real therapeutic effect."[35] Placebos had been a form of medical treatment for centuries, but Beecher's work led the scientific community to give placebos a key function in experiments and how conclusions were drawn about treatment.

---

[34] Lamont, "Spiritualism and a Mid-Victorian Crisis of Evidence," 902. Contemporary advocates of the New Atheist movement make similarly unfounded arguments for a unilateral rejection of any and all religious belief, yet science's limited understanding of the universe does not support strict atheism.

[35] Henry K. Beecher, "The Powerful Placebo," *Journal of the American Medical Association* 159, no. 17 (1955): 1606.

Magical thinking can serve the useful function of allowing spectators to consider potential relationships between seemingly unrelated events. "Faith" healing may be an accurate categorization of the phenomenon, because, as neuroscientist Terence Hines explains, the patient's belief that she has been healed *is* the mechanism by which healing can occur:

> The placebo effect and the temporal variability of pain in any painful disease work together to produce a powerful illusion that a faith healer or a quack has effected a 'cure'. In addition to the temporary remissions and easing of symptoms seen in many diseases, in rare situations a disease may spontaneously disappear. This happens even in some types of cancer. Everson and Cole (1966) surveyed the world medical literature and found 170 well-documented cases of spontaneous regression or remission of cancer.[36]

A description of the scientific approach must take care when considering instances of magical thinking, because a fantastical claim may indicate that a seemingly impossible event has real cause-effect relationship, but that the purported cause is inaccurate. According to anthropologist Phillips Stevens Jr., belief in magical healing is widespread, and "so similar are some of these principles among all human populations that some cognitive scientists have suggested that they are innate to the human species."[37]

Magical thinking runs the risk of an "anything goes" approach to explaining phenomena. Science should welcome challenging and impossible ideas, but only to a

---

[36] Terence Hines, *Pseudoscience and the Paranormal* (Prometheus Books, 2003), 384.

[37] P. Stevens, "Magical Thinking in Complementary and Alternative Medicine," *Skeptical Inquirer* 25, no. 6 (2001).

certain extent. An expert in sensory perception, neurologist David Eagleman explains how these limits should apply to supernatural claims:

> It's not anything goes. It's anything goes at first, and then what we do is import the tools of science...so it would be terrific if ESP [extra-sensory perception] existed, we'd love that, but to the extent that we've love that, but to the extent that we're currently able to do it, we've studied these sorts of things and can't find any evidence to weigh in favor of it.[38]

Eagleman is an advocate of "possibility spaces"—a kind of conceptual playground where scientists perform experiments with an open mind. The Seybert Commission is an excellent example of open-minded scientific inquiry; its members *wanted* to uncover the mechanisms that explained the presence of spirits and yet they could not. A strict and indiscriminate rejection of *any* connection—such as the standpoint of many contemporary skeptics—promotes a narrow-minded and fundamentally non-scientific perspective. According to Eagleman,

> [leaves] the public with a misconception that scientists don't have the capacity to gamble beyond the available data, that scientists are acting as though we've got it all figured out...or if we don't know how yet, we're pretty sure that our toolbox will capture it.[39]

An open-minded science permits entities such as Edinburgh University's Koestler Parapsychology Unit, whose faculty and students research and investigate paranormal events.

---

[38] David Eagleman, "Expanding Perceptions," in *TEDx Houston* (2010).

[39] Ibid.

The Science of Magic

The endurance of supernatural belief despite opposing scientific claims suggests that a logical reason exists to explain its overwhelming pervasiveness throughout history. David Eagleman notes that humans' notion of "objective reality" is limited to our range of sensory experience:

> We are built out of very small stuff, and we are embedded in a very large cosmos, and the fact is that we are not very good at understanding reality at either of those scales, and that's because our brains haven't evolved to understand the world at that scale. Instead, we're trapped on this very thin slice of perception right in the middle. But it gets strange, because even at that slice of reality that we call home, we're not seeing most of the action that's going on...In fact, what we see is less than a 10 trillionth of what's out there.[40]

Eagleman's argument remains consistent with our definition of magic and science as mutually exclusive, but reminds us that our grasp of objective reality is infinitesimal. Science allows us to reach beyond our perceptual limits to investigate claims and search for rational solutions, moving from the known to the unknown in a systematic way.

Anthropologist Stewart Guthrie offers "anthropomorphization" as an explanation for the human propensity to attribute supernatural agency to unexplained events. According to Guthrie,

> we animate and anthropomorphize because, when we see something as alive or humanlike, we can take precautions. If we see it as alive we can, for example, stalk it or flee. If we see it as humanlike, we can try to establish a social relationship. If it

[40] "Can We Create New Senses for Humans?," in *TED Talk* (2015).

> turns out not to be alive or humanlike, we usually lose little by having thought it was. This practice thus yields more in occasional big successes than it costs in frequent little failures. In short, animism and anthropomorphism stem from the principle, 'better safe than sorry.[41]'

Guthrie's explanation is consistent with Darwin's conclusions on the process of natural selection, and presents a rational and scientific reason for the continued belief in magic despite logic that says otherwise. Psychologist Justin L. Barrett calls this cognitive mechanism the "hypersensitive agency detection device," which he argues is a hard-coded product of evolution that likely enabled the development of supernatural beliefs and continues to contribute to their reinforcement.[42]

From Trances to Tricks

Although beliefs in supernatural agency may have provided an evolutionary advantage, contemporary skeptics see real magic as a break in logic that threatens logical reasoning and harms the credulous believer. Spiritualist mediums who convince audiences of a supernatural presence during a séance are taking advantage of the spectator, often defrauding them for money while perpetuating unwarranted and potentially reckless magical thinking. Although some late nineteenth century scientists were capable of concluding that mediums were misleading their audiences—as the Seybert Commission demonstrates—many were fooled, unable to recognize the deceptions involved.

---

[41] Stewart Elliott Guthrie, *Faces in the Clouds: A New Theory of Religion* (New York: Oxford University Press, 1995), 5.,

[42] Justin L. Barrett, *Why Would Anyone Believe in God?* (Lanham: AltaMira Press, 2004).

> It may seem surprising that a Spiritualist medium could easily trick observing scientists, but scientific rigor was still developing, and, as Georgina Byrne observes, there were few 'professional' scientists at this time, and it was possible for people who did not make their living in science laboratories to engage enthusiastically and seriously in 'scientific' experiment.[43]

Stage magicians, however, are the most qualified fraud detectors because they use the same skill-set as the mediums. Harry Houdini was determined to expose the dishonest practices of Spiritualist mediums because, as James Cook puts it, the Spiritualists were "unfair competition" for the magicians and their "tricks."[44] Houdini not only spoke out against Spiritualists in public forums, but he also corresponded with government officials asking for laws against séance fraud, disclosed the names and addresses of mediums at Rotary Club meetings, and even trained law enforcement officers on deception detection techniques at the New York Police Academy.[45]

Magician and filmmaker George Méliès returned to the stage with his production *Les phenomenes du spiritisme,* or *Le spiritisme,* in which Méliès performed alongside fellow magician Jean-Eugene Legris. Legris played a Spiritualist medium and presented his

---

[43] Byrne, *Modern Spiritualism and the Church of England, 1850-1939*, 2.

[44] James W. Cook, *The Arts of Deception: Playing with Fraud in the Age of Barnum* (Cambridge, MA: Harvard University Press, 2001).

[45] Kenneth Silverman, *Houdini!!!: The Career of Ehrich Weiss : American Self-Liberator, Europe's Eclipsing Sensation, World's Handcuff King & Prison Breaker*, 1st ed. (New York, NY: HarperCollins Publishers, 1996), 360-61.

"magic" alongside Méliès, who "duplicated the most sensational phenomena attributed to spirit mediums through the technique of stage illusion."[46] Although it is likely that these magicians were acting out of a genuine concern for the public, they were also fighting to secure the legitimacy and popularity of their performance art. Contemporary magicians such as James Randi and Penn & Teller carry on with the traditions of Houdini and Méliès, fighting against beliefs in supernatural magic.

The urgency exhibited by magicians in exposing frauds—which often risks exposing the mechanisms behind the magician's own tricks—reveals a crucial insight into how audiences interpret performances of stage magic. The notion of the magic "trick" is impossible to comprehend without a skeptical viewpoint. The trick, which is the subject of the next chapter, would not function for audiences that make no distinction between magic and science. Arthur Conan Doyle, a devout believer in Spiritualism, best demonstrates this requirement. Doyle's commitment to magical thinking was so strong that he refused to believe the claims of skeptic magicians, and instead was "convinced that Maskelyne and Houdini possessed mediumistic powers, which they chose not to acknowledge."[47]

---

[46] Matthew Solomon, *Disappearing Tricks : Silent Film, Houdini, and the New Magic of the Twentieth Century* (Urbana: University of Illinois Press, 2010), 25.

[47] Byrne, *Modern Spiritualism and the Church of England, 1850-1939*, 28-29.

CHAPTER 2

MAGIC AND THE TRICK

Audiences' relationship with magic changed as belief in potent, supernatural magic declined during the 17th and 18th centuries. The coinciding emergence of a rational, technical-minded worldview caused audiences to dismiss performers of supernatural magic as frauds, while simultaneously empowering performers of stage magic. Both kinds of performance often require the same components to deceive spectators. The crucial distinction, of course, lies in presentation and intent. The performer of supernatural magic uses deception to convince the audience that magic is the only explanation. The stage magician uses deception for the same purpose, but only after admitting that the performance is mere trickery.[48] As David Hess puts it, the mediums of Spiritualism are cheating not only their audiences, but cheating the competition (magicians) for those audiences:

> [For] a magician...interest in Spiritualist phenomena was to show that mediums are, in a sense, magicians in disguise...Houdini believed that unlike true magicians, who admit that their work is legerdemain, mediums use legerdemain but mislead the public by failing to admit it. In a sense, then, they provide unfair competition in the world of psychic entertainment.[49]

---

[48] This admission may not be explicit in every performance, but it is almost always implied. The trick depends on the audience knowing that it is an illusion.

[49] David J. Hess, *Science in the New Age: The Paranormal, Its Defenders and Debunkers*

Although no specific historical moment marks the end of a belief in real, supernatural magic, the growth of the sciences did contribute to a relative decline in its popularity. While even today some continue to embrace the possibility of supernatural agency, the 19th century saw a steady rise in audiences' preference for magic presented as staged entertainment.

Most historians acknowledge that the transition from a belief in real magic was neither immediate nor was it a mere precursor to widespread rationalist thought.[50] Keith Thomas and others complicate the fate of magic as a belief system, indicating overlapping examples of early rationalist interpretations as well as lingering adherents to supernatural beliefs. Many of these accounts then turn to German sociologist Max Weber and his theories of rationalism and disenchantment. In *The Sociology of Religion,* Weber argues that scientific knowledge eventually overtakes less rational beliefs such as real magic, thus stripping away any supernatural elements in the world. As Weber explains, "the fate of our times is characterized by rationalization and intellectualization and, above all, by the 'disenchantment of the world.'"[51] While Weber's interpretation seems to summarize the shift away from belief in real magic leading up to the Enlightenment, the notion of disenchantment overlooks the enduring appeal of secular magic.

Keith Thomas's work avoids a discussion of magic on the stage—an omission noted by James Cook in *The Arts of Deception.* Cook sees the Western magician as a neglected figure of cultural significance:

(Madison: University of Wisconsin Press, 1993), 32.

[50] For a detailed discussion of the decline of magic, see Thomas, 656-68.

[51] Max Weber, *The Sociology of Religion* (Boston: Beacon Press, 1993), 155.

> Most late nineteenth-century observers, however, would have been baffled by such suggestions. In their eyes, the very fact that magic had become mere entertainment only increased its fascination, social relevance, and historical importance.[52]

Disenchantment, then, is incomplete at best, and (at least by the 19th century) has yet to eliminate the presence of the supernatural. Most audiences, however, are unwilling to accept the possibility of supernatural agency. Given this widespread rejection of superstition, why do audiences still enjoy performances of magic?

One approach is to conclude that some degree of enchantment persists as a permanent component of cultural history, and that a rational, scientific worldview only introduces more mysteries while further demonstrating the infinite complexity and unknowability of the world. Cook emphasizes that the "unknown" provides both a platform and a context for the performance of impossibilities. Exhibitions by stage magicians succeed as a result of a lingering pretense of mystery:

> The antebellum curiosities engineered by Maelzel and Barnum, after all, would not have been possible if the decline of traditional magic had effectively quelled all sense of mystery and enchantment in the world. For viewers to find these riddles about thinking machines, mermaids and nondescripts intriguing, a modicum of public uncertainty about their impossibility was essential.[53]

This response, however, only begins to approach the complexity of the problem. Audiences may have retained an interest in magic as performance despite the shift toward rationalism, but these supernatural remnants provide a sort of reference: a backdrop

---

[52] Cook, *The Arts of Deception: Playing with Fraud in the Age of Barnum*, 166.

[53] Ibid., 165.

against which to experience performances of magic. This description answers *how* audiences can possibly experience magic. To understand *why* they enjoy it, we must step back and examine the experience itself.

In a world where science discredits belief in magic, you would think that there would be little interest in it. But there is. Illusionist David Copperfield has earned more money and sold more tickets than any other solo performer in history—40 million tickets and over 4 billion dollars—and he also holds the record for the most Broadway tickets sold in a week.[54] Stage magic's popularity is rather consistent: Houdini and Thurston also boasted record-earning salaries in their day. These performances of deception differ from their supernaturally-suggestive sibling in one key area: the audience is aware that some rational explanation exists and that the performer—despite displays of supernatural ability—has none. The magician tricks the audience by presenting an impossible situation.

The audience's experience of stage magic is this experience of being tricked, but the notion is complicated. The performer doesn't trick the audience to believe in supernatural magic, so what are magicians tricking their audiences into believing? The trick is perhaps the most common expression used to refer to the performance of stage magic, but the term needs unpacking. Why do we even call performances tricks, and most important, why do audiences enjoy the experience of being tricked?

Defining the Trick

Unlike the exploitative supernatural performers, the stage magician establishes trust between performer and audience, guaranteeing a safe environment that eliminates

---

[54] Morgan Brennan, "Magician David Copperfield's $800 Million Fortune Could Make Him a Future Billionaire," *Forbes* (2013).

malice in favor of mischievousness. A trick in this context, although it retains elements of deception, is playful. To describe all performances of stage magic as a trick, however, invites confusion. Tricks are one of several identifiers that comprise what Simon During calls the "Magic Assemblage: "a "loose cluster of entertainment attractions based on effects, tricks, dexterities, and illusions."[55]

Unfortunately, neither magicians nor scholars present consistent interpretations of these terms, either across disciplines or within their respective fields. Even excluding variations due to historical differences—largely the focus of During and Butterworth's texts—many authors indiscriminately employ words such as "trick" and "illusion" without consideration for specificity, classification, connotation, or historical usage. Disentangling these terms provides a necessary clarity and permits further organization among the different performances.

When using the term "trick" in reference to magic, there are at least two distinct phenomena. The first is the subject of the previous chapter, where a performer deceives his audience while the audience remains unaware of the deception. This occurrence is commonly referred to as a *confidence trick*, or a *con,* a description that perfectly illustrates the relationship between performer, audience, and trust. The confidence trick gains an audience's trust only to take advantage of it. In contrast, a magician—an honest liar—establishes trust through a mutual rejection of the impossible; the performer entertains rather than defrauds the audience.

Both kinds of tricks share a common property: if someone exposes the mechanisms behind the trick, the deception fails. Our distinction between confidence and magic tricks

---

[55] During, *Modern Enchantments: The Cultural Power of Secular Magic*, 215.

suggests a possible explanation for enjoying performances of stage magic. Unlike cons, magic tricks present a challenge to audiences in the form of a performed puzzle. If tricks and puzzles are synonymous, then perhaps the challenge to solve accounts for the appeal of a trick.

In his TED talk on the subject, magician David Kwong explains how his performances relate to his other job as a New York Times crossword puzzle constructor:

> I believe that magic and puzzles are the same because they both key into one of the most important human drives: the urge to solve. Human beings are wired to solve, to make order out of chaos...When you do the crossword puzzle or when you watch a magic show, you become a solver, and your goal is to try to find the order in the chaos.[56]

Kwong then performs a magic trick, selecting a volunteer from the audience to complete a simple task, after which the volunteer opens an envelope to reveal that Kwong had predicted her choices prior to the talk.

Although this hard-wired desire to solve puzzles might explain an audience's initial interest in a magic trick, tricks and puzzles are not interchangeable concepts. Lawrence Hass objects to the conflation of magic and puzzles, arguing that "scholars and magicians alike have shown that the experiences are remarkably different. Being puzzled involves knowing that there is a solution and being inspired to apply effort to solve it."[57] A puzzle's challenge is stimulating; discovering the solution, satisfying. Magicians, however, guard

---

[56] David Kwong, "Two Nerdy Obsessions Meet — and It's Magic," in *TED* (2014).

[57] Lawrence Hass, *Performing Magic on the Western Stage: From the Eighteenth Century to the Present*, ed. Lawrence Hass and James Peck (New York: Palgrave Macmillan, 2008), 21.

their secret methods for a reason: a magic trick no longer entertains if audiences know how it is done. The opposite case—the inability to solve—can also ruin the effect, as magician Henning Nelms describes in his instructive *Magic and Showmanship:*

> Conjuring puzzles have a special weakness. When a spectator meets the challenge by solving the puzzle, the conjurer loses. When the spectator fails, he regards the conjuring puzzle like any other puzzle; he gives up and feels entitled to be told the answer. This places the performer in an insolvable dilemma. If he refuses to divulge his secret, the spectators feel frustrated and resentful; if the conjurer yields, the explanation seems so trivial that they feel let down.[58]

Hass shares this perspective, explaining that an audience left puzzled is a failure on the part of the magician, who, as a result of his shortcomings, is "theatrically impoverished."[59]

A magic trick, then, is an unusual kind of puzzle—one that requires a delicate balance between the desire to solve and giving up in frustration. A trick is not a puzzle for which the audience has *no* solution. The magician provides a solution (an impossible one). The trick works only when an audience can't find a non-magical solution and *doesn't want to.* They have no choice but to accept the magician's impossible alternative.

The delicate balance that leads audiences to this conclusion should seem familiar, because it parallels the balance needed to sustain a belief (or merely the possibility of a belief) in the supernatural. Both real and secular magic point toward a magical "Otherness,"

---

[58] Henning Nelms, *Magic and Showmanship: A Handbook for Conjurers* (Mineola, NY: Dover Publications, 1969), 6-7.

[59] Hass, *Performing Magic on the Western Stage: From the Eighteenth Century to the Present*, 21.

which collapses if approached or inspected too closely. As with solving a puzzle, explaining the supernatural renders it obsolete. According to During,

> the magical domain can be radically 'other' to the ordinary life only insofar as it remains unknowable. As soon as we communicate with or represent the Other...it begins to lose its Otherness. It joins the conceptual machinery of this world.[60]

Because magic tricks present a puzzle whose only solution seems to be a supernatural one, the effect is magnified by the possibility of a magical otherness, further demonstrating that magic tricks possess complexities beyond a simple puzzle.

The magician's job is a complex one. The performer must present and sustain an impossible challenge to an audience that is prepared to analyze and solve it. Spectators are, according to Macknik,

> naturally suspicious and will try to discover the method behind the trick...a successful magician will either have made it impossible to discover the method, or will seem to have ruled out all possible methods (including the actual method) until magic is the only apparent explanation.[61]

Although tricks are a kind of puzzle, they are appealing for reasons that are opposite to

---

[60] During, *Modern Enchantments : The Cultural Power of Secular Magic*, 39.

[61] S. L. Macknik et al., "Attention and Awareness in Stage Magic: Turning Tricks into Research," *Nature Reviews Neuroscience* 9, no. 11 (2008): 875.

Macknik's definition of magic tricks on page 871 explicitly indicates the supernatural: "Using completely natural means, magicians create effects (magic tricks) that seem to be outside the laws of nature." I shall return to the intersection of puzzles and the supernatural as well as their resulting effects later in this chapter.

those of most puzzles: audiences are neither capable nor desirous of finding a solution for themselves. Instead, they accept an impossible explanation provided by the magician. The trick thrives in this unusual balancing act—a puzzle but not—sustained and suspended.

Unsurprisingly, many magicians and scholars invoke Samuel Taylor Coleridge's notion of the suspension of disbelief to explain what is happening with the trick. If the trick leaves no other explanation than an impossible one, perhaps audiences willingly choose to believe in the supernatural. Henning Nelms shifts from dismissing puzzles as an explanation for magic tricks to acknowledge that "successful deception results in unquestioning belief. Conviction requires only what is called 'suspension of disbelief...' This may seem like a weak basis for illusion, but the result can be overwhelming.[62]" For Nelms, suspension of disbelief demands a narrative distraction. Merely performing a magic trick—arousing and sustaining puzzlement—demonstrates the lack of some crucial element that affords a sense of significance to the performance.

The magic trick itself is not enough to engage audiences. Like puzzles, tricks can be commodities, with their secrets bought and sold. Harlan Tarbell's *The Tarbell Course in Magic,* one of the most prolific textbooks for instructional magic, embodies the commodification of the magic trick.[63] Tarbell is quick to dismiss the notion that a magician is simply one who accumulates a number of tricks:

---

[62] Nelms, *Magic and Showmanship: A Handbook for Conjurers*, 19.

[63] By raising the issue of commodification I am not a dismissing the buying and selling of tricks as a destructive practice that cheapens the value of the trick. Rather, commodification serves to illustrate the disconnect between trick and performer, emphasizing a need to imbue the performance of a trick with some greater meaning.

> I could teach you fifty tricks and you would be happy to know them—and perhaps you would think you were a magician when you had learned these tricks. I know, however, that you wouldn't be a magician—you would be only a person doing tricks.

Tarbell considers magic tricks as a kind of recipe, comparing the performance of tricks to experimentation with chemistry:

> Imagine going into a chemical laboratory and doing fifty experiments according to directions given you...If you completed the fifty experiments without disastrous results, would you then be a chemist? No.[64]

The magician must provide a meaningful context, typically in the form of a narrative, to achieve this significance. Nelms devised the frequently cited "Ham Sandwich Theory" to illustrate the difference between a magic trick with and without an accompanying narrative:

> No matter how astonishing a trick may be, it suffers from one major fault—it has no point. Suppose you could work miracles. Suppose that, without coming near me, you simply gestured toward my pocket and told me to put my hand in it. I did so and took out a ham sandwich. This would no doubt amaze me, but after I had recovered from my surprise my only feeling would be, 'So what?' But suppose I say, 'I'm hungry,' and you reply, 'I can fix that. Look in your left coat pocket.' When you do so, I find a sandwich. This has a point. It makes sense. You cannot work that sort of miracle, but you can add meaning to your conjuring.[65]

---

[64] Harlan Tarbell, Ralph W. Read, and Harry Lorayne, *The Tarbell Course in Magic*, Rev. ed., 7 vols. (New York, N.Y.: L. Tannen, 1944), 46.

[65] Nelms, *Magic and Showmanship: A Handbook for Conjurers*, 5-6.

The narrative distracts the spectators from the puzzle of a magic trick, suspending them in the fiction.

Professor and magician Robert E. Neale avoids any explicit reference to Coleridge by instead outlining how audiences experience "illusionment" and "disillusionment." Illusionment equates to being fooled by something and contrasts with disillusionment, or a "shocked realization" that the illusion isn't true. The wonders of magic lie in a balance between the two:

> Illusion is not believed or disbelieved, but, as I have expressed awkwardly, make-believed. To simply believe illusion, to confuse it for the realistic world of common sense, is to be either crazy (if the illusion is totally private) or fundamentalistic (if community is involved). To simply disbelieve it is to narrow one's humanity. By contrast, to play with illusion respects both its separateness from the other realms and its unique contributions to our lives. [66]

Neale's shift toward the notion of make-believe seems like a fresh perspective, but his solution is situated somewhere between belief and disbelief, ultimately echoing Coleridge. This interpretation of "make-believe" and "play" is an in-between—a suspension—between "illusionment" and "disillusionment," that resembles the explanations offered by Henning Nelms.

Both Nelms's and Neale's answers are, however, altogether unsatisfying. Nelms blends his discussion of stage magic with examples from ventriloquism and staged drama, yet he offers no distinction between the three. Instead, he seems to view performance as a

---

[66] Robert E. Neale, *Performing Magic on the Western Stage: From the Eighteenth Century to the Present*, ed. Lawrence Hass and James Peck (New York: Palgrave Macmillan, 2008), 218.

vehicle for convincing audiences to believe in all kinds of performed fictions. In this view, suspension of disbelief should account for how audiences enjoy the above three examples of performance and it should function in the same manner, regardless of the performance. The magic trick, however, differs from Nelms's other two examples. Neither ventriloquism nor staged drama present seemingly impossible and unexplainable deceptions. The audience doesn't marvel at the dummy's voice because its source is a mystery.

The fiction accompanying a trick is more complicated, and behaves differently from other fictions. Suspension of disbelief cannot wholly explain the doubleness of performances of stage magic: that audiences know it's not real but, unlike ventriloquism or a drama, they don't know how the deception works. The trick is not a suspension of disbelief: it is a dare. The magician presents an impossible situation and challenges the audience to explain it. The deception remains whether you suspend your disbelief or not. Critic Vincent Canby encapsulates this perspective in his review of magician Ricky Jay's one-man show: "Is this theater? You bet it is. You aren't asked to suspend disbelief—you have no choice."[67]

Nelms's discussion of narrative, however, presents the opportunity to clarify terminology. To distinguish between the "recipe" component(s) of a trick and the trick performed with an accompanying narrative, magicians identify the former as the "method" (or methods—a trick can have more than one) and use "trick" to describe the latter.

Methods should be understood as a recipe: its ingredients can include objects, actions to be performed, etc., but the method is not a performance. Instead, methods

---

[67] Vincent Canby, "A Season of Albee, Obsessions Safely Intact," *The New York Times*, 1994/02/20/ 1994.

function in service of tricks, and the magician must keep the recipe and its ingredients a secret from the audience to maintain the trick's effectiveness. Fundamentally, the trick is the *act* that makes the magic and the magician, and not simply the presentation of a puzzle with an impossible answer or the performance of a method. Instead, the trick is the performance of a specific kind of puzzle, and the method is the device around which the puzzle is constructed to conceal its role in tricking the audience.

This understanding expands on Harlan Tarbell's critique of would-be magicians who only accumulate tricks; methods are the key to the trick—its secret—and learning the method allows one to perform a trick, but does not make the performer a magician. Tarbell would disagree that the trick is the act that makes both magic and magician: performing without context fails to address the concerns raised by Nelms's Ham Sandwich Theory. There's no need, however, to introduce new terminology to isolate these interpretations. An accompanying narrative distinguishes between performing a trick and doing it *well,* and only the latter can evoke a response from the audience by making magic happen.

Methods

So far we've dispelled the two most common claims about how audience experience the trick: that the trick is a mere puzzle and that the trick's fiction work through the suspension of disbelief. A more productive approach might be to set aside the question of defining the trick and to work inductively by looking more closely at the mechanism behind the trick: the method.

Several recent efforts seek to connect science to theories of magic, most of which attempt to unpack the trick and present a concise taxonomy of its potential methods. Neuroscientist Stephen L. Macknik delineates the range of methods a trick may employ in

the following way: "visual illusions (afterimages), optical illusions ('smoke and mirrors'), cognitive illusions (inattentional blindness), special effects (explosions, fake gunshots, et cetera), and secret devices and mechanical artifacts (gimmicks)."[68] Only the first three categories interest Macknik due to the cognitive functions at work behind them, leaving the last two—special effects and devices—undefined beyond a handful of examples. Psychologist Gustav Kuhn presents three categories of methods—misdirection, illusion, and forcing—indicating that this list is incomplete but that it should demonstrate the potential to reduce the trick into basic components, each of which correspond to "known perceptual and cognitive mechanisms."[69]

These lists provide a good starting point, but both have problems. Psychologist Peter Lamont opposes the categorization of tricks into distinct mechanisms, arguing that it is an oversimplification. The methods at work behind the trick often function in a symbiotic relationship and complicate simple classification. Further, Kuhn's goal of reducing magic to a list of methods is, according to Lamont, an inaccurate correlation between the method and the audience's experience: the "effect." Lamont and Wiseman give a broader definition to the performance of magic, which "employs a method (how the trick works) to produce

---

[68] Macknik et al., "Attention and Awareness in Stage Magic: Turning Tricks into Research," 871. What I am calling a gimmick, Macknik would refer to as a "device." He uses "gimmick" as the term for the final category in this list: "secret devices and mechanical artifacts." I've chosen to swap this usage. My next chapter's focus on electronic devices necessitates categorizing "secret devices and mechanical artifacts" as "devices" rather than "gimmicks."

[69] Gustav Kuhn, Alym A. Amlani, and Ronald A. Rensink, "Towards a Science of Magic," *Trends in Cognitive Sciences* 12, no. 9 (2008): 353.

an effect (what the spectator perceives). Success requires that the spectator experience the effect while being unaware of the method."[70] This definition stems from magician Dariel Fitzkee's *The Trick Brain,* written as a manual to assist magicians in developing their own tricks. Fitzkee clarifies that neither the method nor the effect alone constitutes a trick—both are necessary conditions—and that a trick may include any number of methods and effects. Contrary to Kuhn, Fitzkee also explains that the same effect can result from different methods.

Lamont concludes that "the aims of magic and science are radically different"; academics are interested in explaining and categorizing methods, while most magicians consider methods endless, their boundaries in flux and their applications malleable. Instead, magicians tend to explain and classify the effects in their writings rather than methods, yet they concede that "the purpose of the many attempts by magicians to systematize what they do has not been to provide any sort of definitive list but simply to offer to magicians another way of understanding their craft."[71]

We are approaching a better understanding of the trick. It shares some traits with puzzles (methods are concealed solutions) while presenting an accompanying narrative to discourage the audience from solutions other than magic. The narrative is part of the method, and the audience's experience of the magical solution is the effect. This

---

[70] Peter Lamont and Richard Wiseman, *Magic in Theory: An Introduction to the Theoretical and Psychological Elements of Conjuring* (Hatfield, UK: University of Hertfordshire Press, 1999), 1.

[71] Peter Lamont, John M. Henderson, and Tim J. Smith, "When Science and Magic Meet: The Illusion of a 'Science of Magic'," *Review of General Psychology* 14, no. 1 (2010): 18.

interpretation of the trick is broad enough to avoid the trap of categorization and allows us to look to Lamont's proposed alternative to attempting to understand magic as science, and instead focus on investigating specific aspects of stage magic. There's no advantage to classifying and explaining every method in order to define the trick. Although individual methods may vary, all serve the same purpose of enabling a trick's effect. By examining a specific method, however, we can step through its functions and better understand the trick.

The Illusion

Of the numerous methods suggested by academics and magicians, one is an outlier, having additional characteristics beyond serving as the secret: the illusion. Both Macknik and Kuhn supply a detailed analysis of the illusion, though their interpretations differ to some degree. To add to the confusion, the term "illusion" is perhaps the most mistreated of magic terminology, plugged in to satisfy circumstances both broad and narrow. Macknik's and Kuhn's treatment is more specific than most, explaining how certain neurological responses relate to the illusion as a method. More often, however, "illusion" describes the performance of a large-scale trick. In *Magic: Stage Illusions and Scientific Diversions,* magician Albert Hopkins outlines his interpretation through contrast:

> After a series of sleight-of-hand tricks the magician usually leads up to what might be called "set pieces" in contradistinction to the sleight-of-hand tricks. Chief among the more important illusions are the wonderful cabinets and other articles of furniture which enable the wizard to make away with his assistants...All of these illusions, as they depend upon pre-arranged machinery, afford an introduction to

> the tricks which, though much simpler, require a certain amount of aptness in manipulation.[72]

Most magicians and scholars describe illusions in this context: a "trick plus something." Nelms offers a similar definition of illusion as the meaningful performance of a trick with a discernible context[73]. Magician Robert E. Neale presents the illusion as a performance that is either neutral, destructive, or creative, which can entertain, con, or provoke the audiences.[74] Each of the variations that Neale discusses is a performance flavored by a specific context to elicit a distinct response. As a "trick plus something," the illusion is often just another vague synonym for a performance of stage magic.

Macknik's and Kuhn's usage, however, liberates the illusion from theatrical interpretations and identifies it as a component (method) rather than a performance (trick). As a method serving the trick, the illusion describes three distinct phenomena: optical, cognitive, and visual illusions. Of the three, optical illusions are the most familiar, but Macknik's definition is narrower than Kuhn's: "Unlike visual illusions, optical illusions do not result from brain processes: they manipulate the physical properties of light." Examples include refraction, such as a pencil appearing bent or broken when half-submerged in water, or the use of mirrors to mask the contents of an open crate presented to an audience. Visual illusions, or "phenomena in which the subjective perception of a stimulus does not match the physical reality of the stimulus," account for misleading

---

[72] Albert A. Hopkins, *Magic: Stage Illusions, Special Effects, and Trick Photography* (New York: Dover Publications, 1976), 27.

[73] Nelms, *Magic and Showmanship: A Handbook for Conjurers*, 5.

[74] Ibid., 224.

drawings and for the critical flicker fusion necessary to perceive films as moving images.[75] Although Kuhn's definition for cognitive illusions closely resembles Macknik's, he makes no distinction between optical and visual illusion. I agree with Kuhn, as the differences between optical and visual illusions are negligible for my purposes. Their similarities, however, are enlightening.

Optical illusions describe a perception that differs from objective reality. Neither Kuhn nor Macknik, however, discuss this method's crucial difference from all other forms of deception: one cannot help but experience an optical illusion. As we have seen, revealing a trick's method strips away its potency by solving the puzzle and nullifying the effect. Explaining an optical illusion, however, has no impact on the *method's* capacity to deceive. Even though you understand refraction, you still perceive a pencil half-submerged in water as bent or broken. Revealing an optical illusion as the method behind a trick still solves the puzzle and dispels the magic, but a degree of deception remains. It is the only method that evokes an involuntary deception. Even tricks with effects relying on cognitive illusions, a method that the human brain is predisposed to experiencing, fail to deceive audiences once the method is revealed.

In a sense, optical illusions are both methods and quasi-tricks, possessing their own method—in this case a kind of "visual hallucination," as explained by Kuhn—and, to some extent, an effect. These effects, however, are non-magical. We know that optical illusions result from known cognitive processes, but our capacity to experience this illusion remains unchanged.

---

[75] Macknik et al., "Attention and Awareness in Stage Magic: Turning Tricks into Research," 871.

Awe

We've clarified what the trick entails, but why do audiences like it? As explained earlier, the experience of a magician tricking an audience differs from generic fictions, which lack the doubleness of the trick. Audiences can explain the deception at work in a play or a film, but have no explanation for the trick's particular deception other than magic.

Although spectators perceive the trick's effect—and that effect is a magical one—the effect itself is not the emotion that audiences experience. Dariel Fitzkee lists nineteen basic effects, from those based in the physical (Production, Vanish, Transposition) to the mental (Thought Reading, Prediction, Extra-Sensory Perception), but makes no mention of how the audience responds to these apparent results beyond a few incidental descriptions of the performance as "mysterious" and "apparently miraculous."[76] Macknik and Lamont, too, are silent on what emotions, if any, result from an effective performance of magic. Kuhn, however, provides an informational "Introduction to Magic" section, which begins with the following:

> What is magic?
>
> At heart, magic is about producing a sense of wonder in the spectator. The performance of magic requires a method (how the trick works) to achieve an effect (what the spectator sees)...One of the central aims in magic is to prevent the audience from detecting this method. If this is done successfully, the spectator can be made to experience effects beyond anything that could occur in everyday life.[77]

---

[76] Dariel Fitzkee, *The Trick Brain: A Thorough Handbook on the Mechanics of Magic*, 6 ed. (Provo, Utah: Magic Box Productions, 2009), 11.

[77] Kuhn, Amlani, and Rensink, "Towards a Science of Magic," 350.

This brief overview seems compatible: it echoes Lamont, Wiseman, Macknik, and others' interpretation of the trick and it coincides with Fitzkee's references to the miraculous. And while wonder—that is, to wonder *at*, not wonder *about*—comes close to describing the emotions that the audience experiences, I suggest that "awe" is more accurate. According to psychologists Keltner and Haidt, the experience of awe includes the feeling of wonder, but also "involves being in the presence of something powerful, along with associated feelings of submission. Awe also involves a difficulty in comprehension."[78] Definitions of wonder tend toward curiosity and surprise rather than power or a lack of comprehension—two notions that encapsulate the "otherness" central to performances of magic (both supernatural and staged). The conditions of awe are two-fold, requiring that the spectator encounters something *vast,* or "anything larger than the self or the self's ordinary level of experience," and that the experience triggers a need for *accommodation,* or "a challenge to or negation of mental structures when they fail to make sense of an experience of something vast."[79]

In performances of magic, vastness results from a perceived disparity in power between magician and spectator, because the magician seems capable of supernatural effects while the spectator remains unable to explain the magician's tricks. Keltner and Haidt provide examples of vastness unrelated to power (insofar as that power is not defined by the potential for fear or dread), such as athletes capable of exceptional skills and celebrities. Both of these non-powerful cases can apply to the magician—often a celebrity

---

[78] Dacher Keltner and Jonathan Haidt, "Approaching Awe, a Moral, Spiritual, and Aesthetic Emotion," *Cognition & Emotion* 17, no. 2 (2003): 303.

[79] Ibid., 303-04.

himself, who demonstrates exceptional skill through nimble, practiced card or coin manipulations, etc.

Vastness alone, however, cannot result in an experience of awe: audiences must also feel the need for accommodation. A trick succeeds by convincing the audience that magic is the only possible explanation. Audiences know that the magician is attempting to deceive them, and magicians expect the spectators to search for every possible solution left unexamined. To ensure that their methods stay a secret, magicians employ what Juan Tamariz calls "false solutions" to guide the spectator away from a desire to uncover the method.[80] According to Tamariz, false solutions are a way of frustrating the audience: stepping them through an exhaustive list of possible methods only to disprove them. Some false solutions are overt, such as asking the audience to inspect an item; others are covert, such as dropping a coin to prove that it's solid. By presenting several explanations as dead ends, the magician is "closing the doors" on the logical, leaving magic as the only possible answer. The audience's acceptance of the "impossible" explanation epitomizes the accommodation process: despite knowing that the magician has no supernatural abilities, spectators cannot assimilate the experience and must accommodate for the potential magical possibilities.[81]

---

[80] Juan Tamariz, *The Method of False Solutions and the Magic Way*, 2 ed. (Seattle: Hermetic Press, 2014), 19.

[81] Keltner and Haidt explain that accommodation only triggers a *need* for accommodation. The spectator can fail to fulfill this need (usually relating in fear) or succeed, which they explain as an enlightening experience. Magic tricks seem to fall somewhere in the middle. The audience may partially assimilate the experience by accepting it as a trick, but without

A Parallel Paradox

In *Paradoxes of the Heart*, Noel Carroll poses two questions about how audiences respond to an experience analogous to magic shows—the horror film. First: why are we afraid of things we know aren't real, and second: why do we enjoy an experience that frightens us? The parallels to magic are obvious. In the case of the magic trick, the questions are instead: why are we in awe of something when we know it's not real? and why do we want to be? The first we've come close to answering already, but let's turn to Carroll's conclusions to get a sense of what a satisfying answer to each question might look like.

To answer the first question about horror, Carroll follows a familiar route of addressing the popular theories employed when explaining how audiences experience horror films. He starts by demonstrating the shortcomings of both the Illusion Theory—audiences believe they are in the presence of an actual monster—and the Pretend Theory—audiences experience a false emotion, or quasi-fear. Carroll the presents Thought Theory as an alternative, arguing that "art-horror here is a genuine emotion, not a pretend emotion, because actual emotion can be generated by entertaining the thought of something horrible."[82] This response does not, however, apply to the experience of awe as a result of magic, because performances of magic involve a different relationship between the audience and the fiction. Spectators experience art-horror not as a result of fearing an actual on-screen monster nor from a pretend, quasi-fear, but because they can be afraid of

---

knowing the method, understanding and assimilating the event is incomplete.

[82] Noël Carroll, *The Philosophy of Horror, or, Paradoxes of the Heart* (New York: Routledge, 1990), 80.

a thought, such as "the thought of the Green Slime that generates our state of art-horror, rather than our belief that the Green Slime exists."[83] The audience realizes that the film and its contents are a fiction, and while the audience may question how some aspect of the film was made, (e.g., which special effects were used), they do not question that the film is a product of a known process involving actors, a script, etc.

This model does not apply to performances of stage magic. The equivalent experience would instead be a film about a magician, where the audience knows the methods employed via the process of filmmaking. Carroll's answer to this first question fails to explain the doubleness behind the audience's deception. Our definition of the trick requires that the methods remain a secret for the effects to function. Audiences experiencing art-horror during a horror film need only to entertain the thought of the monster, whereas the audience for a magic trick is at a loss, and is forced to experience a need for accommodation because the magician has disrupted an otherwise fundamental cause/effect relationship by presenting magic as the only possible solution. The result is a feeling of awe.

Carroll's second question, "why would anyone *want* to be horrified, or even art-horrified?" mirrors our second question: why do audiences enjoy being tricked? In this case, Carroll provides a more relevant answer for the experience of magic, explaining that

> All narratives might be thought to involve the desire to know—the desire to know at least the outcome of the interaction of the forces made salient in the plot. However, the horror fiction is a special variation on this general narrative motivation, because it has at the center of it something which is given as in principle unknowable—

[83] Ibid.

> something which, ex hypothesis, cannot, given the structure of our conceptual scheme, exist and that cannot have the properties it has.[84]

Horror films, like performances of magic shows, require a certain distance between the audience and the unknowable. Exposing the method of a trick cripples its potency, just as showing the monster well-lit in the first act weakens the mystery and appeal of the unknown.

The appeal of magic, then—like horror—lies in a fascination with the unknown and the anomalous, enhanced by narrative. Audiences derive pleasure from a sustained curiosity in what Carroll identifies as "categorical violations," or, as Keltner and Haidt would explain it: encounters that trigger a need for accommodation. Although audiences of horror films and magic shows couldn't seem more different, they enjoy these fictions for the same reason: a desire to know the unknowable.

Magic in Transition

In the previous chapter, magic occupied a different space in the minds of the audience. This relationship changes during the enlightenment into a more common understanding of magic as a staged event—the performance of tricks—and although audiences are unlikely to believe in supernatural magic in this disenchanted age of technology, they retain their desire to experience its effects: namely awe. The appeal of contemporary magic assumes that audiences have rejected its supernatural potency while maintaining a sort of nostalgic desire to encounter the unknowable by experiencing awe in the performance.

---

[84] Ibid., 182.

While most audiences no longer have a belief in magic, they remain close to it and aware of it; their relationship illustrates the same nostalgic yearning described by Schiller's "On Naive and Sentimental Poetry," where audiences have a romantic desire to return to the magic of the past, yet they understand magic differently and at a distance.[85] Although he describes the sentimentality of the modern age—where individuals can no longer experience a naive oneness with nature—Schiller provides an apt analogy for how audiences perceive the awe of staged magic. Prior to the Enlightenment, spectators were more likely to experience a naive awe during an encounter with magic. Despite an inherent otherness, magic isn't perceived through a filter. It's situated somewhere in the Great Chain of Being, perhaps obscured, but it belongs, and audiences accept magic as another natural (although supernatural) aspect of life.

Most contemporary audiences, however, recognize the impossibility of supernatural magic, and therefore can only experience a sentimental awe. Performances of magic provide a temporary and playful engagement with the supernatural or the unexplainable. At this distance, the magic is less potent, and the awe more sentimental. In the age of computers, that distance continues to expand. Technology is fulfilling and even out-pacing the capabilities of magic, further shifting the realm of possibility. The trick's method is

---

[85] Friedrich Schiller, "On Naive and Sentimental Poetry," in *German Aesthetic and Literary Criticism: Winckelmann, Lessing, Hamann, Herder, Schiller and Goethe*, ed. H. B. Nisbet (Cambridge, UK: Cambridge University Press, 1985).

The relationship with Schiller extends deeper with tricks themselves. Audiences are convinced that the solutions to tricks are simple-yet-obscured, which coincides with a naive understanding of magic: a simple form of true genius, a direct expression of nature.

obscured, but relies on simplicity. In contrast, technology obscures *through* complication, and does not feel like a trick, even if spectators know nothing about its method. Can tricks use technology without sacrificing their simplicity and mystification, and can technology itself be a trick? The next chapter examines the role of technology in performances of magic and how audiences' expectations and interests fluctuate with the inclusion of technology in tricks.

CHAPTER 3

TECHNOLOGY IN MAGIC

The use of sophisticated technology to produce a magic trick feels like a form of cheating; it makes the trick seem non-magical. Magicians call technology and devices employed as the method behind the trick a "gimmick." This term carries a negative connotation in most contexts, and the *Oxford English Dictionary* identifies its initial use as a means for cheating in gambling: "a device used for making a fair game crooked."[86] If magic becomes harder or impossible with sufficiently advanced technology, what is the relationship between technology and tricks and at what point does technology undermine the trick's magic?

Technology is, by definition, non-magical, and we have no inclination to explain gadgets or machines in terms of magic. The average spectator, however, likely could not explain every step necessary to create a smartphone or a computer any better than da Vinci could. Modern electronic devices are full of complex engineering—obscured, like the trick's method—and can perform tasks that were impossible less than a decade ago. A spectator (or consumer), however, would not consider these devices to be "tricks."

One explanation is that such a device itself lacks the sort of accompanying narrative that magic tricks require, as explained in the previous chapter. Moreover, as such devices

---

[86] "gimmick, n.". OED Online. September 2015. Oxford University Press. http://www.oed.com.proxygsu-uga1.galileo.usg.edu/view/Entry/78347 (accessed November 09, 2015).

become ubiquitous, they become accepted as familiar and unremarkable. Yesterday's magical impossibilities have not only been realized through invention but commoditized and made commonplace.

One is tempted to conclude, then, that technology is incompatible with the phenomenon of the "trick," and that as technology becomes more complex, tricks feel less "magical" and evoke less awe. Some contemporary magicians, however, have effectively used cutting-edge devices such as smartphones, tablets, and other electronics as the centerpiece of their performances. Do these devices inhibit the magic of the trick, or can they somehow empower and enable it?

Tech for Tricks

Both the method behind a trick and the inner-workings of technical devices are unknown processes to most audiences and consumers. At first glance it may appear that the hidden complexity of technology mirrors the method/effect relationship of the trick, and that technology itself might be a kind of trick or quasi-trick. A lack of understanding, however, is insufficient to cause audiences (or consumers) to experience something magical. In the previous chapter we defined the trick in terms of its components: the method, the effect, and an accompanying narrative. The narrative must "close the doors" on a number of potential methods, ruling them out to create uncertainty and suggest that magic is responsible for a trick's effect.

Electronics may be too complex for the average consumer to explain, but no one is actively "closing the doors" on the engineers and designers responsible for their development. Any technology on stage, then, seems to threaten the trick's effectiveness. The effects of advanced technology now present a rational, scientific alternative to magic's

miracles, and each new innovation and advance increases the magician's burden to explain technology sufficiently well in order to remove it as an explanation for a trick's method. Tricks whose methods involve a tech-based gimmick are particularly vulnerable, and often rely on the audience being unfamiliar with the technology itself.

One of the best examples of the advanced tech gimmick is Jean Eugene Robert-Houdin's 19th century "The Light and Heavy Chest." Robert-Houdin details the trick in *The Secrets of Stage Conjuring:*

> The heavy chest was a small strong-box, which, placed in a particular spot among the audience, had the faculty of becoming light or heavy at my command. At one time a child could lift it without difficulty; at another, the most powerful man could not stir it from its place.[87]

The adult always failed because a hidden electromagnet, when activated, glued the box to the floor:

> In the middle of the pit, and upon a broad plank which served as a 'run-down' to enable me to communicate with the spectators, I made an opening in which was fixed a powerful elecctro-magnet, concealed by a thin cloth which covered it. The conducting wires were carried behind the scenes, whence, at the proper moment, the current necessary to magnetise the iron was to be despatched. On the under side of the strong box, which was to be subjected to magnetic influence, there was a stout

---

[87] Jean Eugène Robert-Houdin, *Secrets of Conjuring and Magic: Or How to Become a Wizard*, trans. Louis Hoffman (Cambridge, UK: Cambridge University Press, 2011), 55.

> iron plate let into the wood, and disguised by a mahogany-coloured piece of paper, which apparently formed part of the substance of the box.[88]

Robert-Houdin first performed the trick in 1845, and although physicist and inventor William Sturgeon had introduced the electromagnet twenty years earlier, "the phenomena of electro-magnetisim were wholly unknown to the general public," and Robert-Houdin continued to use this method until "a later period, when electro-magnetism had become more generally known."[89] Even after the popularization of the electromagnet, audiences likely would not have been able to explain how electric current generated an on-demand magnetic field. Robert-Houdin abandoned the electromagnet method not because the audience understood the science, but because they knew that such a device existed and that the trick was explainable in scientific terms. Robert-Houdin redesigned the trick to instead use suction, creating a vacuum seal between the box and the floor, and magicians continue to use this simpler method today.

Technology is not incompatible with the trick, but tricks that use little-known, cutting-edge tech as their method seem to have a limited shelf life. Contemporary innovations also cannot avoid the attention received by media—particularly the Internet—which broadcasts each new discovery around the world and secures them in spectators' minds as yet another scientifically-explainable possibility. Even avoiding technology-based gimmicks does not guarantee the trick's effectiveness. In the case of the "Light and Heavy Chest," each of the performances that used the suction method now required that Robert-Houdin disprove the idea that he had hidden electromagnets in the stage, because the

---

[88] Ibid., 56-7.

[89] Ibid., 57-8.

audience's awareness of electromagnetism was enough to provide a scientific explanation for the trick's effect. Although tricks and technology are not mutually exclusive, technological advances expand the audience's understanding of scientific possibilities. Technology is not an unknown (or unknowable) force; it is non-magical, and if audiences are aware of some tech-based explanation for a method, the magic of the effect fails.

Many contemporary devices have unknown (to the general public) inner-workings: "black boxes" that enable the once-impossible. The notion of technology itself has become a catch-all explanation for the unknown, which explains why the shift from an electromagnet to suction preserved the effectiveness of "The Light and Heavy Chest." Audiences are less likely to suspect that the magician has developed a new use for a simple, familiar concept; suction is not a black box. Most advanced technologies, however, are, and their built-in unknowns make them a plausible alternative to magic. This willingness to believe in the scientific without fully understanding each step poses a broad threat to the trick. Technology in magic tends to works when it is covert and the audience neither suspects nor discovers its inclusion in the method (a hidden gimmick such as the electromagnet). The very suspicion, however, that technology *might* explain a trick—even if the audience has no idea how—can render the trick ineffective.

Magician Michael Carbonaro has an unusual way of combining conventional magic with technology in his show *The Carbonaro Effect*. In one episode, rather than adopting the typical magician's persona of the honest liar, Carbonaro poses as a sales clerk in a gadget store, performing tricks as if they were actual tech products available for purchase. "If The Light and Heavy Chest" is the classic example of covert technology as a gimmick, then Carbonaro's "The Amazing Self-Tying Shoelaces" is a complete inversion, with an overt

presentation of technology (although this trick uses none) and a method involving simple misdirection rather than a gimmick. Carbonaro approaches two customers and explains that a new product—The Astro Laces—uses "memory threads" to re-tie your shoelaces.[90] After the customers ask how the laces work, Carbonaro provides a quick demonstration by rolling his foot about the ankle, causing his untied laces to snap back into a tied position. The customers' reactions, however, are closer to an experience of seeing a magic trick than an encounter with a new product. Why does the audience experience this ostensible demonstration of technology as a magic trick?

The typical trick closes the doors on all rational explanations to suggest that magic is responsible. This is not the case here. Carbonaro substitutes technology for magic, yet the performance still seems magical. Despite the actions it elicits, the Astro Laces do not prove the compatibility of technology and magic. In fact, they seem to indicate the opposite. "The Amazing Self-Tying Shoelaces" is a conventional trick wrapped in an unconventional narrative: one that indicates a non-magical agency behind its effect. When the magician leads the audience to conclude that something inherently non-magical, such as technology, is responsible for the trick, the trick risks losing all magical qualities.

Teller is famous for performing the "Red Ball" trick, which also claims a non-magical method. Teller seemingly brings a small red ball to life, causing it to bounce, jump through hoops, and roll around on the stage. Before the trick begins, however, his partner Penn announces to the audience that "'the next trick is done with a piece of thread."'[91] The premise is not even a ruse—it's the truth—but the audience still responds to the

---

[90] Michael Carbonaro, "The Amazing Self-Tying Shoelaces," in *The Carbonaro Effect* (2014).

[91] Chris Jones, "The Honor System," *Esquire*2012.

performance as they would to any other trick. Teller explains that the audience refuses to believe that such a simple method can account for the movements of the ball, because "'sometimes the magic is just someone spending more time on something than anyone else might reasonably expect."'[92] The previous chapter concluded that the magician must close the doors on all non-magical explanations and insist on a magical one. These two examples refines this hypothesis. A "magical" solution is an *impossible* one. Carbonaro and Teller guide their audiences to an impossible (although non-magical) conclusion, with little need to "close the doors."[93]

Other products—cell phones and tablets—in Carbonaro's tech store are complex black boxes, but a lack of understanding is not enough for the spectators/customers to experience the magical. Something different happens with the laces. Applying a black box understanding would not satisfy the audience; the laces are not merely an unknown, they are, at least at present, an impossibility. Teller simulates the impossible by exceeding his audience's willingness to believe that wax and some string can explain the ball's movement. Carbonaro manages to convince his audience that a "new" technology is impossible, an impressive feat, which reveals the potential for magic in the non-magical. Yet, this example—despite claiming an overt use of technology—has none. Technology may provide a unique twist, but this trick would function just as well without it.

Within the relatively small class of magicians who showcase technology in their performances, Ferdinando Buscema comes closest to achieving a satisfying tech-based

---

[92] Ibid.

[93] Both of the tricks are so simple that the complex effect poses enough of a challenge for the audience, and “closing the doors” is not necessary.

trick: where an overt use of technology is critical to the success of the performance. During Boing-Boing's 2013 Ingenuity event, Buscema presents a modified Llullian Wheel, another possibility device, described as a "system of interlocking, inter-rotating wheels [and] an ancestor of the Turing machine, a logic device, "producing results, statements—output of data in general—by a clearly defined mechanical algorithm."[94] Buscema explains that he has "hacked" his upgraded version of the wheel, and it can correctly guess anyone's password. The plate-sized wheel has complex, arcane symbols across its face and a strip of RGB LEDs juts out around its outer rim that cycles through various colors and causes the audience to laugh at this unusual juxtaposition of techno-arcanum.

[94] Werner Künzel, "The Birth of the Machine: Raymundus Lullus and His Invention," *URL: http://www.c3.hu/scca/butterfly/Kunzel/synopsis.html* (2006).

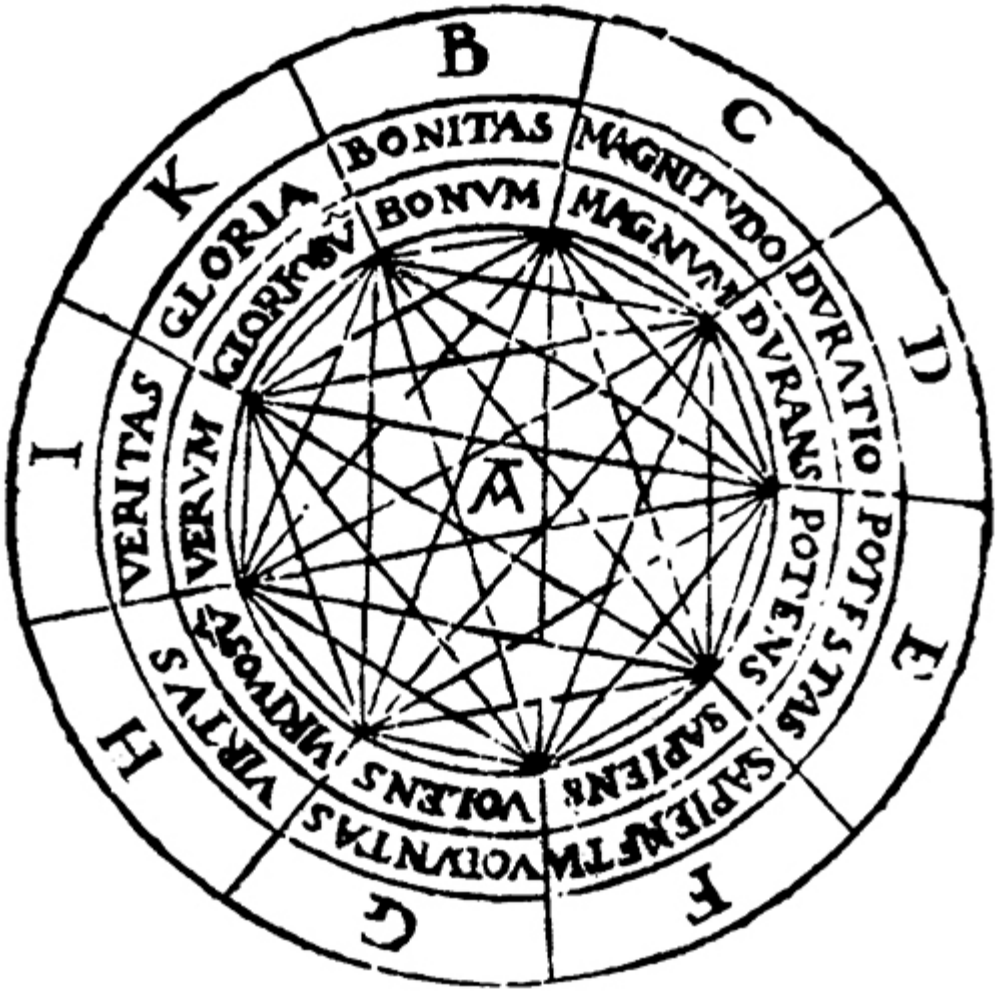

Figure 1. A Llulian Circle.

Buscema invites a volunteer on stage and holds up a smartphone, opening a "Llullian Wheel App" that controls the wheel. The volunteer stares into the face of the wheel as instructed while Buscema checks the phone, presumably to receive some sort of message sent by the wheel. Buscema writes something onto a large white poster board, which he hides from view. He then asks the volunteer to tell the audience his password, and Buscema turns the posterboard around to reveal the he had magically extracted the same password: "LUX23."

The volunteer is dumbfounded, speechless save for a gasping of "Oh my God!" He shakes his head and leaves the stage with a large and genuine smile. Buscema did not use technology as a gimmick, stashing it away as Robert-Houdin did in the floorboards or elsewhere, nor did he disguise a low or no-tech trick as a kind of impossible technology like Michael Carbonaro.[95] This was a tech-trick, and, at least for me (and I suspect for many in the audience), it worked.

Buscema presents the techno-Llullian Wheel as a mind-reading device, and the audience, suspicious of mind-reading technology, considers this to be an impossible function, just as Carbonaro's audience rejects the plausibility of the Astro Laces. By delivering the impossible, Buscema fulfills the requirements for a trick, but the summary I have provided so far skips over the details of the fascinating and conflicting narrative that creates the right conditions for the trick to succeed.

As Buscema explains it, 14th century Spanish philosopher Ramon Llull invented the original Llullian Wheel—a collection of discs covered with arcane writings—to serve as a kind of calculation device that explored combinations of ideas represented by the discs' text. Buscema transitions into the narrative for his trick, explaining that he intends to apply the wheel toward cryptography and cracking passwords, and that his Llullian Wheel is "hacked": presumably with electronic modifications to enable communication and mind reading. What's most interesting about this presentation, however, is Buscema's ability to

---

[95] I do not know the method behind Buscma's trick, so I can only assume it is not as simple as Carbonaro's, although that may be the case and the technology could be an elaborate red herring. Regardless, Buscema presents his trick in such an unusual way that the Llullian Wheel trick achieves more than any other tech-trick presented here.

foster uncertainty. As the volunteer stares into the face of the disc and concentrates on his password, Buscema tells the audience that "in the meantime, via Bluetooth, I'm going to receive some sort of signal."[96] The audience responds to his claim by laughing, to which Buscema playfully adds a dismissive "Yeah, right," suggesting that he realizes the absurdity of his claim and reassuring the audience that this is just a magic trick. Although it may seem like a simple or even unnecessary comment, this casual dismissal provides the perfect example of "closing the doors" on false solutions, an important component of the trick's narrative that Carbonaro's performances skips. Like Carbonaro, Buscema indicates that technology is responsible. Or is it the wheel itself? Buscema casts doubt on the idea that technology could explain everything by playing along with the absurdity. When he first presents the wheel, Buscema "activates the device" by flipping a switch, causing the edge of the wheel to light up and cycle through the colors of the rainbow. The lights do not add to the disc's mystical qualities. The audience laughs at them because they look silly: a tacky addition of flashing spectacle. Technology is not, however, a simple ruse in this trick, and Buscema challenges the audience's dismissal of the technology by emphasizing its complexity, comparing code to arcane text. Buscema points to a large diagram projected onto a nearby screen and explains that this is the "functional scheme" of his Llullian Wheel application. Rather than explain the diagram, Buscema instead dismisses the complexity of the image with sarcasm: "of course it's totally crystal clear for everyone," which emphasizes that both the technological and the arcane are equally powerful and inaccessible.[97] While Carbonaro avoids mentioning magic and instead relies on the laces

---

[96] Ferdinando Buscema, "Magic, Wonder, and Ingenuity," in *Boing Boing: Ingenuity* (2013).

[97] Ibid.

appearing impossible, Buscema experiments with both by subverting and empowering the magic and the technology. The result is an impossible technology *and* an impossible magic that leaves the audience baffled as they witness the magician conjure up the password.

By the end of the performance the audience has no idea how the password was guessed. Technology seems an absurd explanation and Buscema seems to agree, but even if tech could explain the trick, Buscema has carefully aligned his technology with the arcane—both the hacked wheel and the iPhone app—discouraging the audience from attempting to solve the trick like a puzzle. Why would they bother when the code is as impossible to grasp as the occult text on the Llullian Wheel?

Marco Tempest is another contemporary magician using technology in magic, but his use of electronics is even more overt than Buscema's. Although technology is integral to the Llullian Wheel trick, it is a mere component, part of the performances' props and its narrative. In "The Magic of Truth and Lies," Tempest uses three iPod Touches not only as components, but as a means of mediating the performance itself. After introducing himself as a magician, Tempest explains that he has developed some software that "synchronizes video across multiple screens of mobile devices," which he has installed onto three iPod Touches borrowed from members of the audience.[98] Tempest stands center stage at a small

---

By “functional scheme” Buscema is referring to UML (Unified Modeling Language) diagramming, a visual representation of software in diagram form. UML diagrams are typically a helpful tool for the programmer, but Buscema shows an image that appears intentionally small, zoomed out to make the diagram look more complex..

[98] Marco Tempest, "The Magic of Truth and Lies (and iPods)," (TED video, 05:07, https://www.ted.com/talks/marco_tempest_the_magic_of_truth_and_lies_on_ipods, 2011).

table and a projector displays his performance on a large overhead screen. As Tempest launches into his patter, the projector switches to show the video feed from a document camera above the table while he performs close-up magic with the iPods. Most of the tricks are simple productions and vanishes; virtual, on-screen objects become real-life objects and vice-versa. Other tricks imitate close-up card magic, including a three-card Monte illusion using the iPods to mediate the trick by displaying playing cards: one screen shows the Queen of Hearts and the others show the two of clubs. Tempest "shuffles" the devices and covers their screens, asking the audience to identify the Queen. The answer should be obvious. Though we have clearly seen which phone shows the Queen as he places his hand over it, he then removes his hands to reveal that all three iPods now display the two of clubs. The narrative of this trick should communicate that Tempest has performed a transformation effect—a "change in appearance, character, or identity"—in which one screen 'magically' displays a different card.[99] Whereas audiences would find this trick remarkable if he used paper, Tempest uses a screen to mediate the magic, but doing so strips away the magical. Unlike Carbonaro and Buscema, who challenge their audiences to accept an impossible use of technology, Tempest presents something familiar, and the effect does not feel like a trick at all.

The only unfamiliar component is the app that Tempest developed. It is plausible—although unlikely—that a spectator may consider the app's capabilities impossible, but Tempest's performance has another problem: a perceived lack of control. A magician must demonstrate command over the laws of nature before breaking their rules and performing impossibilities. The Astro Laces react as a direct result of Carbonaro moving his foot, and

---

[99] Fitzkee, *The Trick Brain: A Thorough Handbook on the Mechanics of Magic*.

Buscema guesses a password through an apparent control over both electronics and the arcane. In contrast, Tempest demonstrates a relative lack of control. Although he exhibits a clear mastery of traditional prestidigitation with many flourishes and productions, his virtual interactions with the mediated magic are imperfect, revealing the images and animations on the iPods to be canned—a pre-recorded video that Tempest rushes to match. David Saltz provides helpful distinctions to classify media on stage in his taxonomy of interactive performance, "Sharing the Stage with Media." Tempest's iPod videos are an example of non-interactive "there-and-then" media, akin to Windsor McCay's Gertie the Dinosaur, in which McCay performs with an animated dinosaur both on stage and as an animated character.

> In this example, McCay's fictional persona interacted with Gertie as if she were with him here and now, but from the perspective of McCay the performer—whom the audience knew to be Gertie's animator—Gertie clearly existed only in virtual space and was pre-rendered. Not only was there was no deception involved, but much of the charm of the performance derived precisely from the playfulness of this perspectival duality.[100]

The patter in Tempest's performances indicates the magician's role as an honest liar and emphasizes the necessity of playful deception, but, like McKay, Tempest only captures the element of play; he does not perform any real deception. In one effect, Tempest shakes an iPod with images of coins in one hand and tosses real coins onto the table with his other hand, but the coins disappear from the iPod's screen too soon, disrupting the flow of cause

---

[100] Sarah Bay-Cheng, Jennifer Parker-Starbuck, and David Saltz, *Performance and Media: Taxonomies for a Changing Field* (Ann Arbor, MI: University of Michigan Press, 2015).

and effect within the trick. The real coins, once produced, feel coincidental, not magical. Tempest also attempts an example of what Saltz calls "media as mirror" by curling his open hand while a digital hand mirrors the motion across the iPod screens. For Saltz, a successful mirror is one where "the spectators perceive a continuous, reflective connection between the performer and the media object, and as a result can 'read' the performer's actions through the media."[101] The virtual hand closes before Tempest's, however, breaking any perceived connection between the two. The media in "The Magic of Truth and Lies" appear to dictate Tempest's actions—not the other way around—inverting the magician's role in the trick's cause/effect relationship and limiting if not eliminating any demonstration of the impossible.

Even perfect timing would not remedy the shortcomings of the performance's tricks. The trick's effect is not diminished because Tempest uses technology imperfectly, but because he uses technology itself. His audience, like McKay's, knows that Tempest developed the media and they realize that the devices used can account for the "tricks" that Tempest presents. This is not to say that a mediated performance of magic is a series of unintentionally failed tricks. The three-card Monte moment is a tongue-in-cheek imitation of card magic rather than a whole-hearted attempt at a trick, and its method is so obvious that the audience erupts into laughter when Tempest reveals that the Queen of Hearts image has "vanished." The entire performance feels like this—a playful, virtual tour through different magic tricks, using media with built-in functions that exceed the impossibilities suggested by the tricks that Tempest uses them for.

---

[101] Ibid.

We do not believe that technology can account for Carbonaro's trick, and Busecma's technology also leaves us baffled. Tempest's illusions, however, use familiar devices: iPod Touches—which were released along with the App Store three years prior to the performance—and the iPods were borrowed from members of the audience. Tempest presents technology in unexpected ways, but nothing seems impossible. His performance instead resembles a puzzle and the discovery of its solution, and puzzles present a temporary challenge rather than a sustained one.[102] Magic is the result of the audience's failure to solve and their subsequent concession of uncertainly that the impossible happened. With Tempest, there is no uncertainty.

Tempest's performances are captivating, impressive, and a lot of fun, but his narratives seem urgent to make the trick more familiar and accessible. He has a clear reverence for magic, but his attitude toward technology and the magical seems conflicted. Although Tempest does not expressly claim that technology threatens the significance of magic and the trick, the bulk of his performances compare magic to recognizable, everyday experiences as if appealing to the audience and arguing for its relevance. In "The Magic of Truth and Lies," Tempest explains that deception is not unique to the trick; it is also a natural and ubiquitous component of human behavior, highlighting several harmless examples. In "A Magical Tale with Augmented Reality," he illustrates several similarities between tricks, stories, and jokes. His latest performance, "And for my Next Trick, a Robot,"

---

[102] Failing to solve a challenging puzzle should not be considered a sustained challenge, because the goal of a puzzle is to solve it. It invites curiosity and encourages solutions. The trick, however, is impossible, intentionally denying solutions. Its goal is to leave audiences dumbfounded, not curious.

presents magic as a stand-in for unfinished technologies, namely artificial intelligence. Neither robots nor computers have yet to achieve a form of sentience or consciousness, and Tempest recommends substituting magic to achieve the same effect: asking "if we do not yet have the technological solutions, would illusions serve the same purpose?"[103] But the robot sharing the stage with Tempest in this performance is not the source of a single magic trick, and Tempest's occasional productions and vanishes of a small yellow ball are, ironically, far more remarkable than the technological masterpiece next to him and the assortment of functions it can execute.

Tempest's yellow ball proves that the trick can still be effective, but each new capability supplied by technology seems like an appropriation of the impossible, draining the wonder from magic and limiting its relevance. The iPod Touches that Tempest uses in "The Magic of Truth and Lies" are a particularly unique example, because—like all iOS devices—they pose an additional complication; their functions can change based on user-generated applications. When Steve Jobs introduced the iPhone, he criticized the limited user interface of other devices, asking "what happens if you think of a great idea six months from now? You can't run around and add a button to these things. They're already shipped."[104] The iPhone's interactive touchscreen and integrated App Store afford the device an unprecedented versatility. It can be a compass, a flashlight, a video game, or even

---

[103] Marco Tempest, "And for My Next Trick, a Robot," (TED video, 06:18, https://www.ted.com/talks/marco_tempest_maybe_the_best_robot_demo_ever, 2014).

[104] Steve Jobs, "iPhone Introduction Keynote Speech at Macworld 2007," (https://www.youtube.com/watch?v=mqylGY_YSXA2007).

a tool to steal passwords.[105] The possibilities are wide-ranging and unpredictable, the limits explorable and expandable. The result is a device with a built-in "gray area" of functionality, which further complicates the magician's task by giving audiences even more freedom to believe that technology is responsible for the trick's effects.

In the case of the iPod Touch, Tempest would have to present the impossible with a device that invites the user to develop and expand its functions.[106] We would expect a playing card to have fewer applications and functions than a television, but a smartphone, particularly an iOS or Android device, is expandable by design and therefore more capable of the unknown than other technologies. Phones are a microcosm of innovation, with each new application the solution to a puzzle. Audiences regard the phone as a fountain of potential—a kind of possibility device—placing the magician at a severe disadvantage in suggesting that the impossible has happened.

Tempest's performance may not be magical, but is that true of all mediated performances of magic? The cinema offers an analogous platform, with over a century of impossibilities translated onto the screen. Film, unlike Tempest's technology, is a complete meditation, which would seem to suggest that movies are even further distanced from magic. One would expect mediated performance of a trick to break down as it does in the Tempest example.

---

[105] Philip Marquadt et al., "(sp)iPhone: Decoding Vibrations from Nearby Keyboards Using Mobile Phone Accelerometers" (paper presented at the Proceedings of the 18th ACM conference on Computer and communications security, New York, 2011).

[106] In a sense, this function mirrors the structure of a puzzle; each new app is a solution to a problem.

Discussions of the cinema's effect on early audiences often include the myth surrounding Lumière's *Arrival of the Train,* popularized by Hellmuth Karasek's retelling in *Der Spiegel:*

> One short film had a particularly lasting impact; yes, it caused fear terror, even panic...It was the film L'arrivée d'un train en gare de La Ciotat...Although the cinematographic train was dashing toward the crowded audience in flickering black and white (not in natural colors and natural dimensions), and although the only sound accompanying it was the monotonous clatter of the projector's sprockets engaging into the film's perforation, the spectators felt physically threatened and panicked.[107]

Most contemporary scholars doubt the validity of this legend, chief among them Martin Loiperdinger, who refutes the *Arrival* myth by examining first-hand responses to the film:

> The moving images projected onto the screen with the Cinématographe Lumière could hardly be mistaken for reality. Contemporary reports of panic reactions among the audience cannot be found. The repeatedly reiterated anecdote that the contemporary audience felt physically threatened and therefore panicked must be relegated to the realm of film historical fantasy. The myth's dissemination thus serves to ascribe manipulative power to the film medium and thereby fulfills a need that seems to be widespread among film journalists and even film historians. A historically untenable claim, a panic legend, became the founding myth of the medium.[108]

---

[107] Hellmuth Karasek, "Lokomotive Der Gefühle," trans. Bernd Elzer, *Der Spiegel* 52 (1994).

[108] Martin Loiperdinger and Bernd Elzer, "Lumière's Arrival of the Train: Cinema's

The myth in question, however, is not that audiences thought the film was magic. It's that they thought it was a real train. An equivalent situation would be if Carbonaro's "customers" thought that the Astro Laces were an actual product, and pulled out their wallets to buy some: a scenario that would resemble the cons performed by many spiritualists. It is important to note that cinema resisted adoption by spiritualists as a result of the magicians who helped define the medium. Films became a legitimate deception, Matthew Solomon explains, because,

> from the beginning, moving pictures were bound up with the magician's specific tradition of skepticism, which propped up the realist illusions of the cinematograph as perfectly harmless—even beneficial—deceptions. This tradition of anti-spiritualism was one of stage magic's earliest and most important contributions to the history of cinema.[109]

Tom Gunning provides further insight to clarify that *Arrival of the Train* was a harmless illusion, explaining that "rather than mistaking the image for reality, the spectator is astonished by its transformation through the new illusion of projected motion."[110] An audience "astonished" by film could indicate that the experience is a magic trick. Gunning also indicates another important point, that the film is an illusion—as we defined it in the previous chapter—of projected motion. Although an illusion alone is insufficient to qualify

---

Founding Myth," *The Moving Image* 4, no. 1 (2004): 96.

[109] Solomon, *Disappearing Tricks: Silent Film, Houdini, and the New Magic of the Twentieth Century*, 27.

[110] Tom Gunning, "An Aesthetic of Astonishment: Early Film and the (in) Credulous Spectator," *Film theory: Critical concepts in media and cultural studies* 3 (2004): 118.

the film as a trick, this element of deception is worth consideration. Further, Gunning describes *Arrival of the Train* in terms of its newness, echoing his explanation of these early films as belonging to the "cinema of attractions," defined by their "ability to show something" rather than by their narrative.[111]

Novelty of the attraction may not be enough to qualify early films as magic tricks. As discussed earlier, novelty is linked to the trick's method. Audiences may not understand how a complex electronic devices works, but such a device is not a trick when it is in everyone's pocket and explicable by science. Film is now too ubiquitous for audiences to consider it a trick, but audiences of the cinema of attractions had a different experience. George Méliès supports the argument for films as tricks, protesting the exposure of methods used to create film as fatal to the medium:

> Once the public knows how it is done, all idea of its difficulty disappears and they can only say: 'So that is how it is done, that is not so clever.' With the cinematograph it is exactly the same. Nothing is more difficult than the perfect and artistic execution of a well-tricked view.[112]

Although Méliès's understanding of the film as a trick corresponds with the cinema of attractions' novelty, it assumes that the audience is unaware of the methods and that the film's deceptions seem impossible. The most obvious deception is the illusion of motion, but the novelty of this illusion is a poor qualifier for the film as a trick, considering how

---

[111] "The Cinema of Attraction," *Wide Angle* 3, no. 4 (1986): 53.

[112] Georges Méliès, "En Marge De L'historie Du Cinématographe," *Ciné-Journal* (1926): 7, quoted in Solomon, *Disappearing Tricks : Silent Film, Houdini, and the New Magic of the Twentieth Century*, 57.

many devices capable of the illusion of motion precede the cinema such as the zoetrope, praxinoscope, kinetoscope, and others.

One of these early devices provides a helpful contrast to early film—the phantasmagoria—as it was one of the first to present audiences with the novelty of the illusion of motion. The phantasmagoria was a magic lantern show, an early precursor to projected film, passing light through a slide to cast an image onto a surface. Etienne Gaspard Robertson wasn't the first to develop or present the phantasmagoria, but his was the most successful—a 6-year run—and an early example of a trick as illustrated by the audience's willing participation in their own deception. Robertson's device, the Fantascope, had a few improvements over the original. The lantern used an Argand oil lamp, which provided more illumination and thus brighter, more detailed projections. He also mounted the Fantascope on a table with casters, allowing him to move it around during the performance. Robertson typically used several of the devices to rear-project multiple images, resulting in an immersive experience where the audience was prevented from seeing the source of the projections yet was surrounded by these images.[113]

[113] X. Theodore Barber, "Phantasmagorical Wonders: The Magic Lantern Ghost Show in Nineteenth-Century America," *Film History* 3, no. 2 (1989): 73-6.

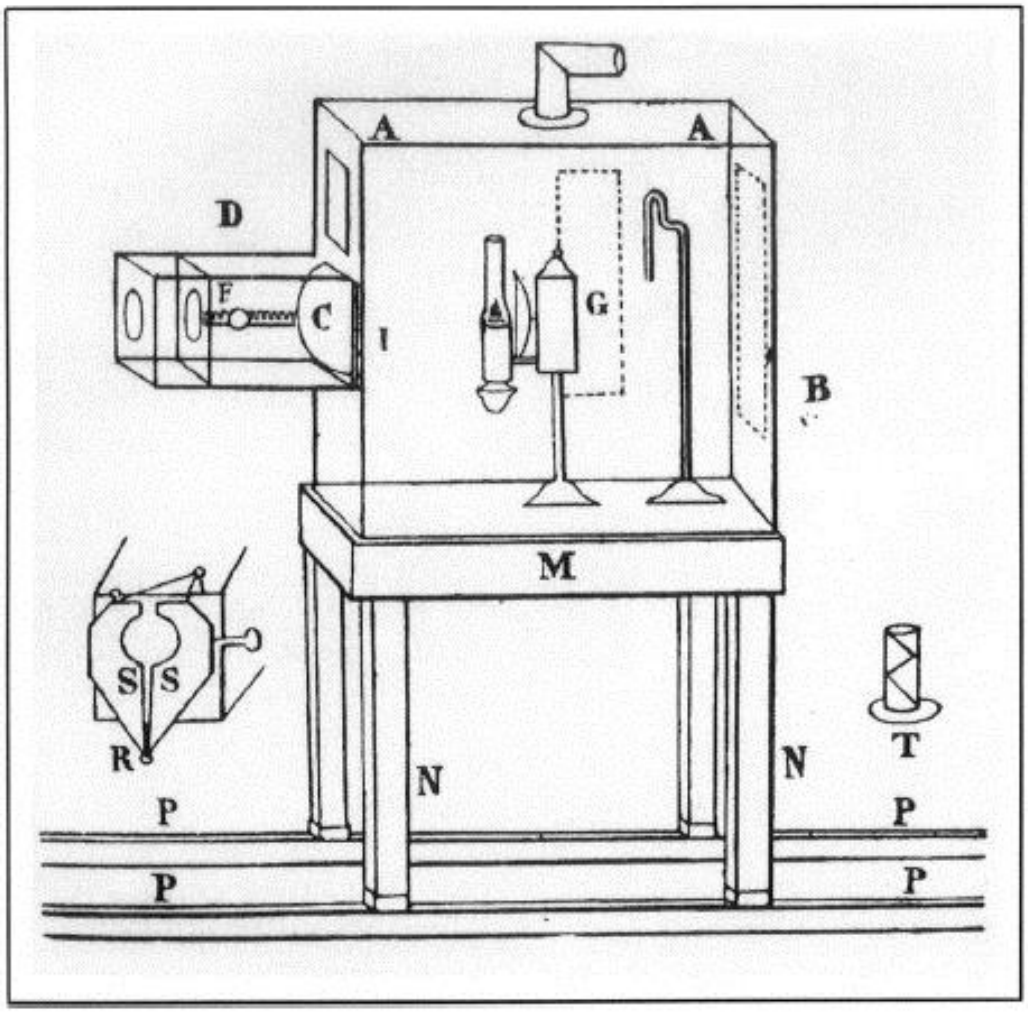

Figure 2. Robertson's Phantascope.

Robertson both prefaced and concluded his performances with a brief explanation that insisted the ghostly images were purely the result of explainable circumstances, mere illusions, and lacked all association with the supernatural or the otherworldly:

> Robertson's stated purpose, however, was not to deceive his viewers, but to demonstrate science's (and by extension, his own) ability to reproduce spectral

> visions using purely natural means...At the conclusion of his ghostly parade, Robertson offered 'a long tirade against the folly of consulting with magicians, sorcery, witchcraft, necromancy, palmistry, fortune-telling by cards, etc.'[114]

His explanation that the show was a demonstration of technical possibilities mirrors other performances of stage magic during this period, keeping the method hidden from the audience while situating the deception in the context of entertainment. Robertson's demonstrations were some of the earliest examples of the modern magic trick.

Lumière's exhibitions provided audiences with a similar (and crucial) context to Robertson's, reassuring them that the film was an illusion. Unlike Robertson, however, the Lumière's films made no attempt to hide the projector, and the presence of the apparatus—a clattering technical marvel in the back of the room—diminishes if not eliminates any deception associated with the illusion of motion itself. [115] Although this illusion was the primary spectacle for the cinema of attractions, film had other deceptions to offer. Gunning indicates a number of film techniques that became attractions after the initial novelty of the cinema itself faded, such as the close-up and the tracking shot, along with contributions from "trick films in which a cinematic manipulation (slow motion, reverse motion, substitution, multiple exposure) provides the film's novelty."[116]

Early trick films, then, were positioned to function as a magic trick, but is this the case? Matthew Solomon addresses audiences' responses to trick films by consulting Méliès:

---

[114] Cook, *The Arts of Deception: Playing with Fraud in the Age of Barnum*, 172.

[115] Loiperdinger and Elzer, "Lumière's Arrival of the Train: Cinema's Founding Myth," 99.

[116] Gunning, "The Cinema of Attraction," 58.

> Such curiosity about how cinematic tricks were accomplished was never powerful enough by itself to sustain audience interest in a film. The short-lived nature of this curiosity is evoked in Méliès's 1907 description of a mystified audience whose momentary desire to know 'how it's done' is quickly dispelled: 'In exhibition halls I have often heard the most absurd remarks unquestionably proving that a large number of spectators are miles away from imagining how much work goes into the views they were watching. Some of them, understanding nothing of the way in which 'that can be done,' simply and naively say: It's only a trick! Or else: They must have taken those in a theater! and, satisfied by their explanation, they conclude with: It doesn't matter, it's well made all the same.' Méliès suggested that the spectators of his trick films were well aware that they had been tricked, but not terribly interested in really determining how these tricks were done.[117]

The audience's lack of interest in solving the mystery of the trick likely translates to a reduced interest in the film, but this is the exact response we would expect from the audience of a magic trick. The spectators abandon attempts to solve and instead enjoy the impossibility of the effect.

Méliès's description of the audience's responses divides spectators into two categories. The first are those who are "miles away" from knowing the method and claim "It's only a trick!" These spectators seem to experience films as magic tricks. The second group has attempted (successfully?) to solve the trick by suggesting that trick films are made in a theater. The second category's responses echo those of spectators that suspect

---

[117] Solomon, *Disappearing Tricks : Silent Film, Houdini, and the New Magic of the Twentieth Century*, 74.

the use of a familiar technology in a magic trick, suggesting that the "trick" component of the trick film is analogous to the use of a gimmick, and, like the electromagnet, had a short window of effectiveness. Solomon indicates that film soon broke from its roots in stage magic:

> With their reliance on technological manipulation, trick films posited a form of magic that was quite different from conjuring and increasingly divorced from mystery. In the end, theatrical and cinematic magic would part ways around issues of occlusion...with the rise of story films around 1908, motion picture producers did not hesitate to expose their tricks to audiences with articles in the popular press.[118]

Despite the magicians' objections to revealing hidden methods, these exposures increased the audiences' interest in movie-going. The practice continues today with "behind the scenes" and "extra features" included on DVDs and elsewhere to generate additional interest in the films. Gunning explains that, special effects became the new novelty attraction, as "recent spectacle cinema has reaffirmed its roots in stimulus and carnival rides, in what might be called the Spielberg-Lucas-Coppola cinema of effects. But effects are tamed attractions."[119] The notion of special effects and the like as "tame" attractions supports the conclusion that films functioned as tricks for a very brief period, after which audiences were too familiar with the methods and technologies to perceive the experience as impossible.

As such, contemporary magicians who perform their tricks on television are subject to extreme scrutiny. Solomon identifies two magicians in particular—David Blaine and

---

[118] Ibid., 79.

[119] Gunning, "The Cinema of Attraction," 58.

Criss Angel—whose televised performances seem non-magical and are criticized by spectators:

> these accusations suggest that media-savvy audiences for both Angel and Blaine detect deception not just in the performance of these magic tricks, but in their televisual representation. What has been elided? How much has actually been shot on location? Who are 'real people,' and who are confederates?[120]

In the same manner that technology is a catch-all explanation for many unknown processes, "special effects" offers a solution to any deception mediated by film, television, or other visual media.

---

[120] Solomon, *Disappearing Tricks: Silent Film, Houdini, and the New Magic of the Twentieth Century*, 128.

CHAPTER 4

MAGIC IN TECHNOLOGY

Andrew Oehler was a singularly non-traditional entrepreneur. A tailor by trade, he left Europe for the United States where he expanded his sewing talents by teaching himself the unique skill of constructing hot air balloons. Oehler traveled across the United States, stopping at a few large towns along the way to create a hot air balloon out of patchwork materials. Once each balloon was finished, Oehler announced a date for a public demonstration and sold tickets to the local population, many of whom had heard about—but not yet seen—this amazing invention. Oehler recounts one such demonstration in New Orleans:

> Here I built me another air balloon, the exhibition of which brought me something handsome: I believe it cost me about one thousand dollars, and the sums of money which I took in by subscriptions amounted to about twenty-five hundred dollars! A great number of spectators attended the exhibition of this (to them) strange phenomenon! I gave orders for my attendants to cut the ropes; they immediately obeyed, and the balloon arose and ascended about half a mile, with myself only in the chair; when I let out the inflameable air, and descended.[121]

---

[121] Andrew Oehler, *The Life, Adventures, and Unparalleled Sufferings of Andrew Oehler, Containing an Account of His Travels through France, Italy, the East and West Indies, and Part of the United States; His Imprisonment in France, Germany and Spain: And the Latitude,*

Although his balloons failed to launch during some of his performances, Oehler was successful enough to travel to Mexico and continue his demonstrations. There he received even more money and admiration from the local population, earning nearly seven thousand dollars on one occasion.

His audiences were delighted by the balloon flight demonstrations, which Oehler described as "an agreeable surprise and astonishment to the ignorant and superstitious Mexicans."[122] Oehler was now something of a local celebrity, and wealthier residents were eager to finance new experiments. Oehler needed a different kind of invention to exhibit if he was to continue to fascinate his audience, so he shifted his focus away from the novelty of flight to another curiosity of the period: electricity. Oehler offers few details on his subsequent invention, "a machine that would attract lightning from the clouds," but he does record the spectators' reactions as awestruck by the device's apparent ability to control lightning, and that "some of the inhabitants eyed [him] with a mixture of jealousy and admiration, as though it had been something supernatural."[123]

Oehler chose to develop his next experiment around the magic lantern, creating his own version of a phantasmagoria performance. As described in the previous chapter, phantasmagoria shows were common throughout Europe during this period and typically featured projections of spectral figures such as ghosts and skeletons. Many spectators were frightened by the supernatural illusions because, as Terry Castle explains, the audience was

---

Soil, Climate, Productions, Manners and Customs of the Different Countries (Trenton, N.J.: D. Fenton, 1811), 112.

[122] Ibid., 123.

[123] Ibid., 127.

> plunged in darkness and assailed by unearthly sounds...subjected to an eerie, estranging, and ultimately baffling spectral parade. The illusion was apparently so convincing that surprised audience members sometimes tried to fend off the moving 'phantoms' with their hands or fled the room in terror. Thus even as it supposedly explained apparitions away, the spectral technology of the phantasmagoria mysteriously recreated the emotional aura of the supernatural. One knew ghosts did not exist, yet one saw them anyway, without knowing precisely how.[124]

These performances, however, were accompanied by the exhibitor's commentary, which served as a disclaimer and explained that the phantasmagoria was a demonstration of technology rather than a supernatural manifestation. As a result, audiences in Europe experienced the phantasmagoria as a magic trick.

Oehler's show, however, was far from typical. Determined to impress his audience, he added several unique innovations to his performance, including pyrotechnics fashioned from gunpowder mixed with 'spirits of wine,' candles that extinguished and re-lit on command, and even a crude (but compelling) form of synchronized speech, in which an assistant spoke through a tube pointed toward a projected ghost's face. The breath he expelled displaced the smoke that accompanied the projection, "moving" the ghost's mouth. Although these new inventions would have likely frightened even a seasoned phantasmagoria-goer, Oehler further doomed his audience by neglecting to include the magician's "honest liar" concession. He informed his spectators that no one would be harmed, but gave no reassurances that the show was a trick or a clever use of technology.

---

[124] Terry Castle, *The Female Thermometer: Eighteenth-Century Culture and the Invention of the Uncanny* (New York: Oxford University Press, 1995), 143-4.

European audiences may not have understood how the ghostly images resulted from technical innovations, but armed with the context of the trick they would have little reason to assume that the performer had commanded the dead to return and to haunt the theatre. Oehler's audience, however, was inadequately equipped for the demonstration. Confronted with terrifying breathing and speaking ethereal ghosts, the uninformed spectators were dumbstruck by the end of the performance. Rather than compliment or congratulate Oehler on the show, they left without a word—even the governor, who had become Oehler's friend and greatest supporter, seemed shaken. Oehler recalls that "instead of using me with free and sociable complaisance, as was his general manner, [the governor] turned himself round, cast a disdainful look back at me, and sheared off with disgust and silent contempt."[125] The following morning, soldiers roused Oehler, placed him in chains, and threw him in jail. He remained confined to a pit 150 feet below ground for several months until a visiting Spanish nobleman—who had seen a phantasmagoria performance presented as a technical demonstration in Europe—convinced the governor that Oehler was not a sorcerer capable of supernatural magic.

In the weeks leading up to his phantasmagoria show, Oehler had exhibited other rare or never-before-scene spectacles to the same community—hot air ballooning and a colossal lightning rod demonstration—without incident. The phantasmagoria audience, however, witnessed something different. For them, the technology responsible for filling

---

[125] Oehler, *The Life, Adventures, and Unparalleled Sufferings of Andrew Oehler, Containing an Account of His Travels through France, Italy, the East and West Indies, and Part of the United States; His Imprisonment in France, Germany and Spain: And the Latitude, Soil, Climate, Productions, Manners and Customs of the Different Countries*, 132.

the performance space with eerie lights and images was not a mere ingredient in a clever technical demonstration, but a manifestation of real, supernatural magic.

In order to investigate the conditions of these performances and the role played by technology more productively, it will be helpful first to establish a clear interpretation of audience credulity. The previous chapter explored the phantasmagoria in the context of the trick, which employs a hidden method to generate an effect. Though the audience fully understands that the magician lacks any supernatural ability, it can find no plausible explanation for the effect other than (stage) magic, and consequently experiences a sensation of awe. Oehler's phantasmagoria only fits the first half of this template for the trick; it employs a hidden method to generate an effect. In this instance, however, the spectators are less committed to a strict rationalism (or at least open to belief in the supernatural). They know Oehler through his inventions, but their perceptions of him differ from that of the "honest liar" magician because Oehler makes no effort to distance himself from the supernatural. The audience is left with no plausible explanation other than supernatural magic, resulting in an experience of awe.[126]

---

[126] According to Keltner and Haidt, the reactions to both of these scenarios would be awe. They suggest that the difference between a pleasurable, entertaining awe and a feeling of horror lies in the accommodation component. An inability to accommodate for the experience would, in their view, likely cause a reaction of fear. This conclusion does suggest, however, that audiences successfully accommodate for stage magic tricks, which seems less clear. Perhaps the accommodation is one that attributes the events to the magician and stage magic without a need for further understanding.

If the audience were fully aware of the method underlying the phantasmagoria, it would have experienced the performance much the same way that present-day audiences experience films. In fact, it is reasonable to consider that these phantasmagoria performances would seem like a precursor to horror movies if the audience understood the method as well as they understand a film projector.[127] As we have seen, Noel Carroll's explanation of why audiences enjoy horror films does not quite apply to stage magic. Since it does, however, apply to a scenario in which spectators understand the trick's method.

According to what Carroll calls the Illusion Theory of fiction, horror film audiences experience fear because they genuinely believe that the on-screen monster is real. Carroll rejects the Illusion Theory as an explanation of horror films, arguing that spectators "just don't behave as though they really believed there were monsters in the vicinity when they consume horror spectacles," and suggests that "if one really believed...one would probably attempt to flee, to hide, to protect oneself, or to contact the proper authorities."[128] Oehler's audience *does* behave this way. They are speechless at the end of the performance and summon the authorities afterward, imprisoning him for sorcery. Carroll carefully distinguishes between the concepts of "thought" and "belief." He outlines the differences as follows:

> To have a belief is to entertain a proposition assertively; to have a thought is to entertain it nonassertively. Both beliefs and thoughts have propositional content.

---

[127] And, arguably, the two (magic lantern, projector) are not that different.

[128] Carroll, *The Philosophy of Horror, or, Paradoxes of the Heart*, 63.

> But with thoughts the content is merely entertained without commitment to its being the case; to have a belief is to be committed to the truth of the proposition.[129]

Carroll argues that film audiences typically *entertain* ideas without *believing* them. Oehler's spectators believe in the magic they witness; their credulity is involuntary because the belief is not a choice. Belief happens *to* them.

If phantasmagorical performances can elicit such different reactions using technology that the audience does not understand, what causes the audience to experience supernatural magic in technology, and can contemporary audiences still have this experience? Is the absence of the "honest liar" context sufficient, or are there other necessary conditions?

Magic at the Movies

Although the phantasmagoria is not frightening audiences anymore, its contemporary incarnation of the horror film does so on a daily basis. The cinema may, however, seem like a poor starting point for uncovering magic in technology. Carroll argues that thought theory applies to almost all films. Belief is rare. As discussed in the previous chapter, even cinema's most popular legend—that audiences viewing Lumiere's *Arrival of the Train* believed they were in danger—is a fabrication.[130] Oehler's phantasmagorical case truly is the exception that proves the rule.

---

[129] Ibid., 80.

[130] Loiperdinger and Elzer, "Lumiere's Arrival of the Train: Cinema's Founding Myth," 96. In the previous chapter I discussed this film in the context of the trick to demonstrate that audiences knew they were watching a film, not a real train.

Filmmaking lacks a sense of mystery. The cinema has never sought to conceal its methods, choosing to reveal behind-the-scenes secrets to generate publicity as early as the first trick films.[131] The practice continues with "behind the scenes" clips and DVD extras that would seem to dispel any mystery concerning film production. Spectators, having general knowledge of these technical processes, would need a compelling reason to believe in a supernatural encounter when attending the cinema.

Films are, however, far from mundane. They command wonder and awe from audiences for every aspect of their development, and fascination with moviegoing is not a recent trend.[132] Instead, it stretches back to the origins of the medium and stems from cultural attitudes surrounding late nineteenth and early twentieth century's technological innovations. This period was "characterized by an idolization of the machine and the belief that the marvels achievable by technology were limitless," according to film historians Robert Allen and Douglas Gomery; admiration for the invention extended to reestablish the inventor as an artist and the machine as "literally a wonder to behold."[133] The cinema offers

---

[131] Solomon, *Disappearing Tricks : Silent Film, Houdini, and the New Magic of the Twentieth Century*, 79.

[132] I am referring to a widespread cultural fascination not only with the cinema itself but with its elements: the celebrities, writers, directors, etc. along with the characters, stories, and more. Even objects-turned-artifacts (costume, props) have a magical quality to them, such as Marilyn Monroe's dress from The Seven Year Itch that sold at auction for $4.6m.

[133] Robert Clyde Allen and Douglas Gomery, *Film History: Theory and Practice* (New York: McGraw-Hill Publishing Company, 1985), 54-5.

the spectator a chance to experience "movie magic," a phrase that encapsulates the audience's fascination with the medium and suggests that the cinema may have ingredients for a supernatural experience.

As a concept, "movie magic" is too nebulous to be useful. More precise is photogénie, a notion popularized by French impressionist filmmaker and film theorist Louis Delluc. According to Delluc, photogénie is the essence of the cinema, and the "source of photogénie [is] located in the ability of the moving image to render an object or character in an expressive way."[134] This aesthetic quality discovers hidden beauty through amplification, just as photography amplifies the beauty in a "photogenic" subject. Equally relevant is Christian Metz's notion of the cinephile, a connoisseur of the cinema "who is enchanted at what the machine is capable of, at the theatre of shadows as such."[135] Like the spectator witnessing photogénie, the cinephile derives pleasure from the entire theatre-going experience, and this pleasure, like photogénie, is unique to the medium of cinema.

Identifying "movie magic" as photogénie or as the cinephile's fetishistic pleasure, however, only provides a general sense of aestheticized magic similar to the experience of sentimental awe mentioned in the Tricks chapter. Noel Carroll's discussion of the Thought Theory of horror films, like photogénie and the image of the cinephile, also falls short of capturing the experience present in Oehler's performance. Oehler's audience somehow believed in the magic. Could a contemporary film cause audiences to believe in the

---

[134] Ian Aitken, *European Film Theory and Cinema: A Critical Introduction* (Bloomington, IN: Indiana University Press, 2001), 82.

[135] Christian Metz, *Psychoanalysis and Cinema: The Imaginary Signifier*, trans. Celia Britton, et al. (London: MacMillan Press, 1983), 74.,

supernatural at the cinema? The criteria are steep. For a film to be magic, it would need to manipulate the audience to act on irrational fears. Two recent examples suggest that a film can manipulate its audience into an irrational belief of the supernatural. *The Blair Witch Project* and *The Ring* are films that present technology as central to the narrative while suggesting that the technology itself permits a connection to the supernatural. Both films were released during the massification of the Internet and engage their audience across several mediums and in unique ways.

The Blair Witch Project

The Blair Witch Project (1999) foregrounds the role of technology as a means of communicating supernatural events, but it does so without any direct presentation of supernatural entities or occurrences. The film's first images are simple, bordering on amateurish, and present a humble logo for the production company Haxan Films followed by a title card that vibrates slightly. It reads:

> In October of 1994, three student filmmakers
> disappeared in the woods near Burkittsville,
> Maryland while shooting a documentary.
> A year later their footage was found.[136]

What follows appears to be a genuine, chronological assembly of found footage documenting the three filmmakers' experience in two distinct formats: 16mm film and handheld video. The bulk of the 16mm footage contains interviews of Burkittsville residents imparting whatever knowledge they may have of a local legend, the Blair Witch. The 16mm clips identify as the more "professional" footage, seemingly intended for the

[136] Daniel Myrick et al., "The Blair Witch Project," (Artisan Entertainment, 1999).

final cut of the doomed documentary. In contrast, the handheld video is of distinct lower quality, suggesting that it is a more personal and informal account of the documentary process. This contrast validates the spectators' understanding of documentary films as an edited product constructed by filmmakers, and reinforces the perceived authenticity of the handheld video footage, which seems to be a raw, unedited account of the filmmakers' behind-the-scenes experiences.

Neither the 16mm film nor the video capture the live presence of a supernatural entity, with the possible exception of the recorded sounds of screams in the distance. The unsteady, "shaky" style of the handheld camera, however, seems sincere. In semiotic terms, *Blair Witch*'s link to the supernatural is indexical rather than iconic. The audience never sees *any* supernatural content, but they do not need to. The film itself serves as proof because it is an artifact; it is “documentary” evidence.

The handheld camerawork is above all disorienting, forcing the audience into an unconventional perspective by refusing to place them in a safe, distant position relative to the actors. Unlike most narrative film, *The Blair Witch Project* always provides an embodied perspective. We are bound to one of the three filmmakers and, as Catherine Zimmer notes, "the most frightening aspect of the film...is the direct experience of fear and vulnerability provided by the first person video camera."[137] The video camera may not capture the Blair Witch herself, but it does present remnants of the supernatural—brief glimpses that suggest the presence of an impossible other. On several occasions the trio encounters this "proof," such as cairns and the hanging bundles of sticks tied together in unusual

---

[137] Catherine Zimmer, "Surveillance Cinema: Narrative between Technology and Politics," *Surveillance & Society* 8, no. 4 (2011): 89.

configurations. The three dismiss rational explanations, deciding that the bundled stick configurations are not the work of some backwoods inhabitant: "This is no redneck. No redneck is this creative." Heather takes her time capturing several of these bundles on film, ignoring Josh and Mike's objections that they should leave. Arguments over which issue is more important—the film or their safety—further supports the authenticity of the images by showing the filmmakers at their worst moments. Their brutal and petty treatment of one another seems too desperate, too repetitive to be a work of fiction.[138]

Although the technology in *Blair Witch* is non-magical, it is susceptible to supernatural influence. The cameras never quite manage to capture any visual evidence of magic-in-action, even in the final moments before the trio is supposedly killed in the abandoned house. The footage itself was purportedly discovered in an impossible location: buried under the foundation of this 100-year-old building, and even the team's compass seems affected when, having walked south the entire day, the trio passes the same downed tree twice.[139]

Blair Witch's unconventional story and style succeed, in part, due to an effective online marketing strategy that offered users supplemental details such as a timeline of events, photos of collected "evidence," and historical documents. The website, combined

---

[138] Their reactions were likely authentic reflections of their emotional state during filming. The film had no script, and the film's crew spent the evenings trying to scare the three actors in order to elicit their reactions.

[139] The supernatural seems potentially plausible in this instance because they previously decided to "just walk south." It's difficult to imagine that they would somehow circle back when aided by a compass.

with the film and a televised psuedo-documentary titled *The Curse of the Blair Witch,* created a true transmedia experience that took advantage of the strengths of each medium, reinforcing the feature film's "authenticity." Neither the psuedo-documentary nor the website acknowledged that *The Blair Witch Project* was fiction. The Internet provided its users with a powerful tool for researching any subject, and the *Blair Witch* site appeared authentic. It included "reliable" sources such as a fictional anthropology professor David Mercer, whose photo reassuringly sits above a block of text citing his claim that "there is no scientific explanation for how the backpack was buried."[140] J.P. Telotte describes The *Blair Witch* site as

> elaborately propagat[ing] the notion of authenticity, attesting to the film as, quite literally, a 'found-footage' type of documentary rather than a fictional work...they suggest we see the film not as a film, but as one more artifact, along with the materials gathered together at the Web site, which we might view in order to better understand a kind of repressed or hidden reality.[141]

This veiled marketing strategy for the *Blair Witch* site forced visitors and audience members to decide: was *The Blair Witch Project* a real documentary, an elaborate hoax, or a clever new form of storytelling?

The Blair Witch Project relies on the non-magical status of technology to lend authenticity to recorded events in order to communicate the presence of the supernatural.

---

[140] Daniel Myrick and Eduardo Sanchez, "The Aftermath: The Blair Witch Project Web Site," http://blairwitch.com/evidence5.html.

[141] Jay P. Telotte, "The Blair Witch Project Project: Film and the Internet," *Film Quarterly* 54, no. 3 (2001): 32.

Like Oehler's performance, Blair Witch succeeded in manipulating audiences into believing that its magic was real. The Blair Witch Project's popularity led many journalists and tourists to visit the town of Burkittsville, Maryland, some of whom were so convinced of the film's authenticity that they were prepared to track down the witch or look for the missing students.[142] Sociologist Margrit Schreier's examination of reactions to Blair Witch reveals that "39 percent [of spectators] are at least temporarily somewhat uncertain as to the film's ontology" and that out of 277 individuals "only three discussants suggest that the film must be fiction because of the sheer impossibility of witchcraft and the like."[143] Henry Jenkins argues that the film's online presence, which "seemed to be absolutely real in every detail," supplied a convincing backdrop and generated a dedicated (and potentially credulous) fan base prior to the film's theatrical release.[144]

The Ring

Gore Verbinski's *The Ring* (2002) follows Rachel, the protagonist, as she investigates rumors that a recent and unexplained death was caused by a cursed video tape. From the outset, the film's first non-diegetic images underscore the presence of technology through

---

[142] Faye Fiore, "A Town's 'Blair Witch' Curse," *Los Angeles Times*, May 31, 2010, http://articles.latimes.com/2010/may/31/nation/la-na-blair-witch-20100601 (accessed June 2015).

[143] Margrit Schreier, ""Please Help Me; All I Want to Know Is: Is It Real or Not?": How Recipients View the Reality Status of the Blair Witch Project," *Poetics Today* 25, no. 2 (2004): 325.

[144] Henry Jenkins, *Convergence Culture: Where Old and New Media Collide* (New York: New York University Press, 2006), 103-5.

the flickering of the "Dreamworks" logo. A few white lines form horizontally across the screen in brief, fracturing streams, resembling an aging VHS tape. A sound bridge of white noise static provides the transition into the first scene, where two girls sit at a television, transfixed:

> I hate television. It gives me headaches.
>
> I heard there's so many magnetic waves traveling through the air, because of TV and telephones, that we're losing like ten times as many brain cells as we're supposed to.[145]

The girls' criticisms introduce these technologies as an invasive and unseeable force, a direct threat to average and innocent people. Their conversation drifts to the crux of the film's plot: the cursed VHS tape that kills viewers one week after they watch it. One of the girls has seen it. Her death at the end of the opening act is shrouded in typical horror movie mystery, and the only clues we receive are a flood of black and white images accompanied by high-pitched screeching sounds. In nearly every instance, the source of the supernatural in *The Ring* derives from some electronic device, typically a telephone or television. One would expect technology—a product of rational science—to work against supernatural elements, but the threatening forces in this film are mediated and would not exist without the delivering technology.

The supernatural takes control of these mediums in order to present sounds or images that should not be possible. Viewers of the tape discover that images of their faces (in photographs, video recordings, etc.) are distorted and blurred beyond recognition to

---

[145] Gore Verbinski, "The Ring," (USA/Japan: DreamWorks SKG, MacDonald/Parkes Productions, BenderSpink, 2002).

indicate that they are "marked" by the curse. These supernatural powers exercise further control over technology experts, leaving them unable to explain the distorted faces, the cursed tape's origin or how the elapsed time on VCRs with the tape show scattered line segments instead of numbers.

While examining the film, Rachel pauses the tape on an frame that appears to have a fly on the lens of the camera—by now a familiar image that the audience knows to be a part of the tape's content. Rachel runs her finger across the monitor and confirms that the fly is just an image. She plays through a few more frames and pauses again, but somehow the fly's wings continue to twitch. Rachel inspects the screen again only to peel an actual, living fly from the monitor. An extreme close-up of Rachel shows her astonishment, which is underscored by her developing a sudden and foreboding nosebleed. The supernatural has "bled" through the technology to invade the characters' world.

The film's antagonist and supernatural agent, Samara, has the psychic ability to manipulate and control technologies. Her powers are, of course, invisible to everyone else, much like the "magnetic waves traveling through the air" first mentioned in the film. The narrative provides no explanation for her ability to dial phone numbers or commit murder via television sets, but the film's climax does show the latter event in detail. On screen, the undead Samara climbs out of a well and walks across a field toward the position of the VHS tape's (presumed) camera. Like the fly plucked from the monitor, Samara too passes through the television screen and into the characters' world, yet her movement and her appearance vary slightly from that of the typical zombie. Her slow procession toward the victim is accelerated whenever the horizontal tracking lines interrupt the image, signaling a skip forward in time and placing Samara much closer. Once she comes through the screen,

Samara retains the washed-out black and white colors of her on-screen image. Her whole body seems illuminated from within and has a slight flicker—she is a mediated monster: a product of technology that retains the traits of the original image as well as the ability to "fast-forward" her position.

Rachel learns that while the tape's curse cannot be lifted, it can be avoided by making a copy and showing it to someone else. In the film's final scene, she helps her son Aiden make a copy to avoid the curse, but there's a problem. To whom will they show the tape? Aiden turns to Rachel and asks: "What about the people we show it to? What happens to them?" A close-up reaction shot follows of Rachel contemplating the consequences. She slowly turns her head, stopping short of directly facing the camera. The film cuts to the opening shot of the cursed tape: a now-familiar grainy, black and white image of water well in the middle of a field. In one sense this is a subjective shot: Rachel's point of view as she and Aiden watch the tape playing on the monitor. In another, more important sense, however, this is not a perspective shot at all. It is an unmediated presentation for *us.* The protagonists have (almost literally) turned on us, deciding that we will inherit the curse.

As with Samara and the fly, the supernatural has yet again passed through from the world of the film into the "real" world. *The Ring* is not the film anymore; it is the cursed tape, and the spectators are now victims. The final scene's clever breaking of the fourth wall seizes upon the audience to extend the magic of the diegetic world into our own. Now the supernatural horrors might exist here, too.

And yet they do not. Audiences have no reason to suspect that the film clicking away in the projector is a magical artifact. For the typical movie-goer, there's little difference between *The Ring* and other horror films. Film scholar Chuck Tryon, however, indicates

that *The Ring*'s release coincided with the increasing popularity of the home theater, and that these viewers would have a vastly different experience. Spectators who browse through the film's DVD extras may encounter a hidden feature: the unabridged version of the cursed VHS tape. Tryon explains the experience further:

> During the duration of the clip, the home viewer's remote control is disabled, prevent her or him from stopping or fast-forwarding to the end, and the very end of the 'video,' a phone rings several times, in imitation of the viewing dynamic within the film.[146]

This loss of control combined with an unexpected "phone" ringing seems more likely to catch viewers off-guard and perhaps even call into question (if only for a brief moment) whether a cursed tape *really* exists.

The Ring introduces its diegetic technology as a vehicle for the supernatural. The end of the film applies this relationship onto the audience, creating a performative moment where the images on the screen are something else. Anything can happen on the screen in a film, but audiences watching the film as diegetic media—transformed into the cursed VHS tape—are faced with the irrational fear that the film itself is cursed. The DVD special feature provides an even clearer example of this reflexivity. Here the DVD has "taken control" of the playback—as Samara would—to present the unabridged version of the tape. *The Ring* was one of the first films I purchased on DVD, and I found the special features section by accident. The Thought Theory of horror explains my reaction to the unabridged cursed tape that played; I was interested and excited to see all of the images that had only

---

[146] Chuck Tryon, "Video from the Void: Video Spectatorship, Domestic Film Cultures, and Contemporary Horror Film," *Journal of Film and Video* 61, no. 3 (2009): 46.

appeared in shortened clips throughout the film. Then the phone rang. The ringing sound caused a flash of terror. I wasn't non-assertively entertaining the thought of the narrative, I was looking for my phone in a brief moment of irrational belief.

Making Movie Magic

Both the Internet and DVDs were relatively new during this time—few understood the conventions of these mediums, because they had yet to be established, and *The Ring* and *The Blair Witch Project* arrived right at the moment of transition for these technologies. The relative newness of the mediums proved disruptive to the cinema and to the audience's expectations for film. Should users inherently trust that information they find is factual when the presentation appears professional? What can a DVD player do? Lev Manovich explains these liminal moments in terms of a change in "cultural language." The cultural language of the cinema displaced that of the printed word, "presenting more and more information in the form of time-based audio-visual moving image sequences, rather than as text"; cinematic language holds a powerful influence over the visual forms of new media, but the language of the computer offers something cinematic language does not: easily-learned and implemented two-way communication.[147] Although Manovich argues that users can adopt new cultural languages with ease, the process assumes that each new language builds on another established form.

For Oehler's audience, it seems the transition was too drastic. Magic lantern shows were relatively unknown in Mexico at the time. Although he was a talented innovator, Oehler was also a foreigner who created amazing impossibilities. His phantasmagoria

---

[147] Lev Manovich, *The Language of New Media* (Cambridge, MA: The MIT Press, 2001), 87.

provoked a violent response because their primary cultural language—likely still the printed word—was too far removed from performance's media. Oehler's audience was ill-prepared to receive and interpret such a rapid-fire introduction to new technologies.

The printing press endured as the primary cultural language for centuries before the introduction of competing inventions. As Steven Johnson explains,

> Technology used to advance in slower, more differentiated stages. The book reigned as the mass medium of choice for several centuries; newspapers had a couple of hundred years to innovate...With each innovation, the gap that kept the past at bay grew shorter, more attenuated. This meant little in the centuries-long increments of the book or the newspaper—not to mention the millennial scale of the cave painter—but as the stages grew more abbreviated, they began to interrupt the life cycles of individual humans.[148]

Oehler's performances forced a succession of new ideas onto the audience over a short period of time that challenged their beliefs about how the world worked. His balloons defied gravity and allowed him to fly, his lightning rod influenced the weather and drew electricity out of the sky to a pre-determined location, and his phantasmagoria cast moving, spectral images of speaking ghosts.

The shifting cultural language landscape also explains how *The Blair Witch Project* and *The Ring* successfully inspired belief in the supernatural. Both films transcend the narrative and become performative events, reflexively implicating the viewer at the moment of viewing. The audience must confront the role of the technology, which is at once

---

[148] Steven Johnson, *Interface Culture: How New Technology Transforms the Way We Create and Communicate* (San Francisco: Basic Books, 1997), 6.

a diegetic and real-world moment, causing the supernatural to bleed through the screen into the room. For these audiences, belief happened *to* them, and they believed in the magic: some for only a moment, for others, long enough to drive to Burkittsville. As with Oehler's performance, these films are exceptional cases. The ability to inspire a transitory, fleeting belief in the supernatural—or, perhaps, a sliver of doubt in skepticism—is possible through technology, but it is unusual.

CONCLUSION

Since the invention of the transistor, contemporary technologies have reached new heights of complexity. Gordon Moore, the co-founder of Intel and Fairchild Semiconductor, explains that the number of components in current technologies doubles every two years: a phenomenon known as "Moore's Law."[149] Moore's Law indicates that the average spectator could, at best, only explain a portion of the technology inside modern devices. Science fiction author and futurist Arthur C. Clarke summarizes the outcome of this phenomenon with his famous quotation: "Any sufficiently advanced technology is indistinguishable from magic."[150] Clarke's suggestion that incomprehensible technology appears to be magic has intuitive appeal, and this statement supports previous examples such as the reaction of Oehler's audience. Clarke's argument, while compelling on the surface, is far from clear. A careful attempt to unpack Clarke's claim provides a useful way to begin exploring the complicated relationship between magic and emerging technology.

The word most in need of explication is "indistinguishable"; does it mean that the audience assertively or non-assertively entertains the proposition that advanced technology is magic? Is an "indistinguishable" technology enough to cause belief? Clarke is

---

[149] Gordon E. Moore, "Cramming More Components onto Integrated Circuits," *Electronics* 38, (1998): 114-117.

[150] Arthur C. Clarke, "Hazards of Prophecy: The Failure of Imagination," *Profiles of the Future,* (London: Hachette, 2013), 14.

not forthcoming. Magic is not a topic of concern for his "Hazards of Prophecy," which instead aims to describe the difficulties of predicting innovation. Clarke's succinct comment on magic, although the most famous and oft-quoted, is little more than an addendum. Indeed, the third law didn't appear in the original publication; he added it to the end of the essay in a revision over ten years later. It is commonly known as the third of "Clarke's Laws," given as follows:

1. When a distinguished but elderly scientist states that something is possible, he is almost certainly right. When he states that something is impossible, he is very probably wrong.
2. The only way of discovering the limits of the possible is to venture a little way past them into the impossible.
3. Any sufficiently advanced technology is indistinguishable from magic.[151]

The first two laws present a more accurate overview of the problems that "Hazards" addresses. Scientific and technological breakthroughs are, according to Clarke, challenging if not impossible achievements for the older, seasoned experts in any given field. They cannot innovate (or predict innovations) due to their long-standing involvement and established understanding of the discipline. Only the young, imaginative thinkers unbound by rigid interpretations can stretch the limits of their field far enough to produce what Clarke refers to as "unexpected discoveries." While these discoveries are not "expected" by younger innovators, they are accessible to them and within the realm of possibility.

Because "Hazards" provides neither a concrete definition nor an example of magic, we can only speculate as to whether Clarke's notion of magic would support a spectator's

[151] Ibid., 14, 21, 36.

authentic perception of the supernatural. Clarke does, however, outline his understanding of technology, categorizing all innovations into one of two classifications. He explains their differences by presenting examples of contemporary technology and by speculating how "great minds" of the past would react upon encountering them. His chosen historical figures (Ben Franklin, Galileo, Leonardo da Vinci, and others) would have no problem understanding the first type of technology, which Clarke limits to mechanistic innovations. A modern machine such as the diesel engine should make sense because it does not require any prerequisite layers of knowledge; its moving parts function in an observable cause-effect relationship.

Clarke distinguishes the second type—sufficiently advanced technology—not by its complexity, but by the spectator's inadequate "mental framework." Clarke, however, neglects to define this framework. Context suggests that “mental framework” describes an individual’s assumptions and predispositions, which closely parallels Hans Robert Jauss's notion of Horizons of Expectation. Jauss argues that spectators do not experience a performance or a text in a vacuum.[152] Audiences are informed by an accumulation of knowledge that influences (for Clarke: permits) their understanding. No additional layers of information are required to understand the moving parts of the diesel engine—you can see how it works.[153] In contrast to the mechanical examples, however, technologies of the

---

[152] Hans Robert Jauss, Toward an Aesthetic of Reception, trans. Timothy Bahti (Minneapolis: University of Minnesota Press, 1982).

[153] Interpreting Clarke’s stance is difficult, because not all mechanical technology is understood through observation. Clarke may have chosen “great minds” examples to avoid questions about the first type of technology and the knowledge necessary to understand it.

second type include a degree of immaterial or unseen functionality that the uninitiated cannot immediately grasp. The invisible electrons that flow through electronic devices or the atoms split for nuclear power would be "utterly baffling to the finest minds of antiquity" because these spectators lack the necessary knowledge to bridge the gap between an outmoded and an up-to-date mental framework.[154]

Advanced technology, for Clark, is not a literal manifestation of supernatural magic. What's important here, however, is not that the audience has a genuine encounter with the supernatural, but that they believe they have. Like the trick, an encounter with sufficiently advanced technology forces the uninitiated to confront their assumptions in order to reconcile an impossible event. Unlike the experience of the trick, however, a credulous audience is not merely entertaining the thought of the supernatural—they need to believe that magic is present. Does Clarke's assertion still apply to contemporary audiences that have an expanded expectation for technology's capabilities?

Our world is saturated with technologies of the second, advanced type described by Clarke, and the suggestion that spectators would find an impossibly complex technology difficult to reconcile makes less sense when those spectators are surrounded by complex devices on a daily basis. Consider designer Thomas Thwaites's experiment to construct a modern toaster from raw materials. Thwaites discovered that even the cheapest toaster—totally £3.94—disassembled into hundreds of individual components:

---

[154] Clarke is careful to note that the increasing a technology's complexity does not necessarily make it sufficiently advanced. He cites nuclear power—splitting the atom—as an example of a simple technology (in theory, not practice) that he claims would be equally baffling to the past great minds as modern electronic devices.

> I dissect my patient into 157 separate parts, but these parts are made up of sub-parts, which are themselves made up of sub-sub-parts. Does the variable resistor that controls the toasting time count as a single part? But it's made of eight sub-parts, so perhaps it should count as eight?...If I were to dissect all the components all the way down to their discrete 'bits,' then I've calculated my toaster-part count would be 404 individual bits.[155]

Thwaites's initial expectations for the toaster's construction is indicative of our contemporary attitude toward technology. What he predicted would be a simple task of collecting a few parts developed into a nine-month-long ordeal and cost a few thousand pounds.

In examining the history of computer advertisements, new media scholar David Gruber explains that technology, having successfully navigated the impending doom of Y2K, no longer saw the computer as a threat, facilitating its further integration into everyday life. According to Gruber, American culture in particular demonstrates

> a new popular way of thinking about the computer, which desires to erase all boundaries between the human and the computer, or more accurately, simply does not care to articulate any boundaries...computers are so well integrated into the Microsoft and Apple brand and the American landscape that showing computers [in commercials] might, at this point, be unnecessary.[156]

---

[155] Thomas Thwaites, *The Toaster Project* (New York: Princeton Architectural Press, 2011), 18-9.

[156] David Gruber, "From the Screen to Me, 1984-2008: Computer Television Commercials and Three Phases of the Human–Computer Relationship," *Media History* 16, no. 3 (2010):

What need is there for an invisible magic when audiences' Horizon of Expectation considers *technology* as the invisible force? Complex technologies are explicable, but who can (or even cares) explain them? Davis summarizes these problems with complexity as follows:

> Today's digital technologies have reached the beachhead of the incorporeal, with the smallest components on some chips shrinking below the wavelength of visible light. Microtechnologies reorganize matter on the scale of silicon grains and genetic base pairs; they invade and inhabit the body; they sculpt vibrating streams of electrons into complex invisible architectures' of logic and information. Twenty years ago, you had half a chance of fixing your car; these days, with computer chips and miniature sensors scattered through the vehicle like chunks of fudge in a tub of Ben & Jerry's, you need some serious tech just to hack the nature of a glitch. [157]

If a simple device such as a toaster has hundreds of components and takes months to build, what chance does the average person have of understanding a phone or a computer? Part of the appeal of magic is its conclusiveness. Magic is an answer with an endpoint; to say "it works because it's magic" suggests that no further inquiry is required. Science, however, is an endless exploration of causality, but it would be futile (for most) to try and explain the layers of complexity in most modern technology. As Davis explains, "The logic of technology has become invisible—literally, occult. Without the code, you're mystified. And nobody has all the codes anymore."[158] The invisibility of contemporary technology is two-

---

351-2.

[157] Erik Davis, *Techgnosis* (London: Serpent's Tail, 1998), 181.

[158] Ibid.

fold. It has reached the point of integration and ubiquity that it goes unnoticed, and most people are too inexperienced or unqualified to use the technology beyond simple interactions. Instead, we consult experts (engineers, programmers, IT specialists) much the same way that pre-scientific revolution societies turned to wizards and witch doctors. If pre-scientific revolution magic was understood as "a real yet unknowable force," then is contemporary technology any different?

For the most part, then, Clarke's assertion is accurate, but the example he provides of an encounter with impossible technology depicts the spectator in protest, exclaiming "What utter nonsense! That's magic, not science. Such things can't happen in the real world."[159] Clarke assumes that audiences would respond to advanced technology the same way that they would respond to a magic trick: with dramatic incredulity. Clarke's Third Law, then, is correct in suggesting advanced technologies are indistinguishable from magic, but contemporary reactions to technology are most often indifference, not incredulity. If technology is magic, it's an unnoticed, naive experience corresponding to a pre-scientific revolution magic, not the magic of Spiritualism or the magic trick.

As explained in previous chapters, magic is defined in terms of its otherness. It is, by definition, both impossible (i.e., unbound by science) and unknowable—a scientific explanation of a supernatural event assimilates it into the realm of the possible. The supernatural is simultaneously uncharted and unchartable; we can map its boundaries but not its territories. If otherness is crucial to the survival of magic, then innovations that result in comparable products—comparable in function rather than in process—are, in effect, a colonization of the unknown.

---

[159] Clarke, "Hazards of Prophecy: The Failure of Imagination."

The "Marauder's Map," from *Harry Potter and the Chamber of Secrets* is a magical artifact that reveals the location of anyone at the school, in real time. The map worked as an impossible magical artifact when the book was released in 1998 and for the film in 2002, but the same functionality became standard equipment on cars and phones just a few years later.[160] Not only can Global Positioning System (GPS) technology indicate position, but additional processing of incoming data can produce information such as land speed, heading, and more. The artifact has become a product, and its supernatural otherness is now a complex system of circuits, electricity, and code. Audiences are indifferent to the presence and function of advanced technology such as GPS—a technology with capabilities considered "magic-worthy" just a few years ago, and the magic of the map is mundane by comparison.

With film, technology seems to have completely appropriated the territory of magic. Trick films have always been a part of the cinema, but recent advances in CGI—digital filming, advanced computer animation software, improved rendering quality and capabilities—have altered audience's expectations for what is possible onscreen. Aside from cases such as *The Ring* and *The Blair Witch Project*, which are the exceptions that prove the rule, there is no reason for an audience to think that an onscreen image is impossible or magical; the spectator can claim that "special effects" are responsible. Have we reached the point where technology, rather than disenchanting the world, has instead *outpaced* the impossibilities of magic, and yet audiences respond with indifference? What magic is left?

---

[160] GPS is more functional than the fictional map, if only for its ability to work anywhere in the world and not just for one location.

One More Thing

When Steve Jobs revealed the iPhone at Macworld in 2007, he was presenting a device with unprecedented features and complexity. Under any other circumstances audiences would consider the phone to be just another example of "sufficiently advanced" technology: an invisible, mundane magic. The iPhone, however, was anything but mundane, inspiring new heights of customer fanaticism, and, "since its premiere in late June 2007, the iPhone has become not only the fastest-selling smartphone of all time but also a significant symbol of change in media engagement worldwide."[161] Unlike other electronics released at this time—seventh generation video game consoles, netbooks, advanced dual-core processors—the iPhone prompted consumers to react with awe and wonder, suggesting that this device offered a different kind of magic.

In *Start With Why,* Simon Sinek argues that Apple's success comes from the company's core philosophy and identity, not from the well-made products:

> How many people do you think would stand on line for six hours to buy a new cell phone from Dell, as they did for the release of Apple's iPhone?...Apple, unlike its competitors, has defined itself by WHY it does things, not WHAT it does. It is not a computer company, but a company that challenges the status quo and offers individuals simpler alternatives.[162]

---

[161] Pelle Snickars, *Moving Data: The iPhone and the Future of Media* (Columbia University Press, 2012).

[162] Simon Sinek, *Start with Why: How Great Leaders Inspire Everyone to Take Action* (New York: Penguin, 2009), 50.

For Sinek, Steve Jobs is the very personification of Apple and its philosophical ideals. The iPhone was a disruptive product both from its design and for restructuring the relationship between phone manufacturers and service providers.[163] Apple's appeal derived from Jobs's personal ideologies, and his desire to challenge the status quo, Brett T. Robinson explains, reflected a higher, if not sacred, cause:

> Jobs saw creativity and life in the cold, beige machines that were taking over corporate cubicles and military installations...Inspired by a sense of spiritual purpose, Steve Jobs warned that an unchallenged IBM would usher in a dark age in which bleak boxes of microchips would turn workers into mindless drones. Jobs flipped the script by imagining computers as mystical tools for unleashing human creative potential.[164]

Most companies market their electronics by boasting impressive technical numbers, but Jobs avoids these details, presenting the iPhone as a personalized experience rather than a device packed with parts, because explaining the details of the processor or other internal components would demystify the product. Even the iPhone itself, like most all Apple products, is constructed to prevent the user from tinkering around inside, with features such as the unibody design and Apple's proprietary "pentalobe" screws. Although critics

---

[163] Prior to the iPhone's introduction, service providers such as Verizon chose what functions a phone would have. AT&T agreed to invert this model and Apple chose the features.

[164] Brett T. Robinson, *Appletopia : Media Technology and the Religious Imagination of Steve Jobs* (Waco, Texas: Baylor University Press, 2013), 6.

cite these design choices as a loathsome example of planned obsolescence, the features serve a secondary purpose.[165]

Jobs describes the iPhone's features through metaphors such as "You can now touch your music" and "iPhone is like having your life in your pocket." The effect is empowering for the audience, instilling a sense of the supernatural by suggesting that spectators ("you can touch" / "your pocket") would have direct power over the intangible ("music" / "life"). The juxtaposition of features without technical details is critical, permitting Jobs's presentation of the iPhone to parallel the structure of the trick. By ignoring the internal components yet drawing attention to the device and its abilities, Jobs transforms an invisible piece of technology into an unmistakable, powerful artifact. When he describes the iPad as a "truly magical and revolutionary product," in his 2010 Macworld keynote speech, the audience has good reason to believe him.

Apple's production model reflects this pattern of product-as-trick by developing its technology in secret to increase the impact on an unprepared audience. The effect, according to Robinson, offers spectators an experience similar to re-enchantment:

> The sense that the world is charged with grandeur and mystery has largely faded in the wake of a dogmatic deference to rationalism in the modern world. As a result, the world has lost some of its primordial magic. Thus, an electrifying encounter with a technological wonder reinvests the world with a transcendent significance.[166]

---

[165] Chris Foresman, "Apple 'Screwing' New iPhones out of Simple Diy Repair," arstechnica, Jan 20, 2011, http://arstechnica.com/apple/2011/01/apple-screwing-new-iphones-out-of-simple-diy-repair/ (accessed August 2015).

[166] Robinson, *Appletopia : Media Technology and the Religious Imagination of Steve Jobs*, 6.

Jobs guarantees the spectator this electrifying encounter by restructuring audience-technology relationships. Devoted consumers of Apple products are known colloquially as the "Cult of Mac" of "Cult of Apple," and, as Robinson explains, derives its fanaticism by choosing to see Steve Jobs as priest figure, whose role is to translate and dictate how one understands technology.

A similar power dynamic appears in Jobs's relationship with other Apple engineers. Former employees describe Jobs's uncanny talent for manipulating others, calling this ability a "reality distortion field." Computer scientist Andy Hertzfeld explains the effect as follows:

> In his presence, reality is malleable. He can convince anyone of practically anything...The reality distortion field was a confounding mélange of a charismatic rhetorical style, an indomitable will, and an eagerness to bend any fact to fit the purpose at hand. If one line of argument failed to persuade, he would deftly switch to another. Sometimes, he would throw you off balance by suddenly adopting your position as his own, without acknowledging that he ever thought differently.[167]

Spectators see Apple products as sacred objects: complex artifacts with powerful functions and imbued with Jobs's personal philosophies that champion individuality.[168] A similar relationship is echoed in the way Jobs treated other Apple engineers. Former employees describe Jobs's uncanny talent for manipulating others, calling this ability a "reality distortion field." Computer scientist Andy Hertzfeld explains the effect as follows:

---

[167] Andy Hertzfeld, "Reality Distortion Field," *Folklore, http://www.folklore.org/StoryView.py?story=Reality_Distortion_Field.txt* (1981).

[168] Ibid.

Jobs wielded immense influence over his employees. Jonathan Ive, who was responsible for designing the iPod, iPhone, iMac and many other iconic Apple products, notes that Jobs often took “too much credit" for ideas originated by others. In his 2007 keynote speech, Jobs skims over the contributions of his employees to suggest that he is the sole creator: a master magic-user who summoned the amazing iPhone directly from his imagination. By extension, the iPhone offers the audience a similar experience. Consumers treat Apple products as sacred objects: complex artifacts that have powerful functions and are imbued with Jobs’s personal philosophy to “Think Different.”

Sherry Turkle indicates that, for the consumer, Apple device ownership carries a greater significance than other products. She explains that “individuals construct their computers as projections of themselves…[T]here is still a tendency to assume that the choice of operating system is a purely ‘technical’ decision. But here, too, we have seen that people are trying to express their cognitive style.”[169] Building off of Turkle’s arguments, sociologist Pui-Yan Lam’s investigation of Apple user communities reveals that for many Apple owners the consumer-product bond is the impetus for an implicit religion, in which the Apple fanatic believes that product ownership corresponds to a kind of morality or righteousness. Lam describes these consumers’ beliefs in terms of a tech-based battle of good-versus-evil, where,

> [for] them, Macintosh is not merely a brand of computer, but a symbol that represents their own philosophy of computing, or even their philosophy of life. While the Mac devotees are fighting for Macintosh, they are actually defending their

[169] Sherry Turkle, *Life on the Screen: Identity in the Age of the Internet,* (New York: Simon and Shuster, 1995), 41.

> beliefs on an utopian future in which humans and technology work in harmony. Furthermore, their devotion to the Macintosh computer helps many Mac enthusiasts create a sense of identity, and leads them to think about who they are, what they value, and where they belong.[170]

Lam argues that beliefs held by Apple-owner communities exhibit the core features of mainstream religions. According to sociologist Emile Durkheim, religions distinguish between notions of the "sacred"—that which is larger than the self and immersed in a collective identity—and the "profane"—that which is mundane and tied to the individual. Mac users unite together under their sacred philosophies professed by Jobs: to "Think Different," to resist an Orwellian future, and to be trendy.

Jonathan Haidt explains Durkheim's concept of the sacred in terms of how it functions: by "blinding" and "binding." Some religions, for example, have laws restricting food choice or the use of certain words and phrases. Many of these rules defy logic outside of any religious context, but adherents choose to remain blind to the reasons behind the sacred in order to uphold a sanctity that is beyond scrutiny. Notions of the sacred stand in direct opposition to standards set by philosophies of science; they are immune to inquiry, falsification, and modification. Although the rigidity of "blindness" seems to be a debilitating flaw, Haidt explains that blindness reinforces the collective's values and thus the collective itself. The impossible and supernatural elements of are a feature rather than a bug. Haidt cautions that

---

[170] Pui-Yan Lam, "May the Force of the Operating System be with You: Macintosh Devotion as Implicit Religion," *Sociology of Religion* 62 no. 2 (2001): 259.

> If you think about religion as a set of beliefs about supernatural agents, you're bound to misunderstand it. You'll see those beliefs as foolish delusions, perhaps even as parasites that exploit our brains for their own benefit. But if you take a Durkheimian approach to religion…you see that religious practices have been binding our ancestors into groups for tens of thousands of years. That binding usually involves some blinding—once any person, book, or principle is declared sacred, then devotees can no longer question it or think clearly about it.[171]

If we consider the "magic" of technology in context of the sacred—as a blinding and binding feature that promotes and preserves collective identity—then Apple products are undoubtedly a form of magic. Jobs's performances transform an otherwise invisible and mundane technology into an impossible object that commands our attention and makes magic accessible, but—and perhaps most important—Jobs also *sanctifies* these products for the consumer, rallying the cult around a sacred system of beliefs.

Apple does not sell phones or computers or tables. They deliver a unique, collective experience that adopts Jobs's philosophies *and* his products as sacred. They sell impossibilities that give the spectator supernatural techno-powers. They sell magic.

---

[171] Jonathan Haidt, *The Righteous Mind,* (New York: Pantheon Books, 2012), 272.

BIBLIOGRAPHY

Aitken, Ian. *European Film Theory and Cinema: A Critical Introduction*. Bloomington, IN: Indiana University Press, 2001.

Allen, Robert Clyde, and Douglas Gomery. *Film History: Theory and Practice*. New York: McGraw-Hill Publishing Company, 1985.

Aykroyd, Peter H. *A History of Ghosts: The True Story of Séances, Mediums, Ghosts, and Ghostbusters*. New York: Rodale, Inc., 2009.

Barber, X. Theodore. "Phantasmagorical Wonders: The Magic Lantern Ghost Show in Nineteenth-Century America." *Film History* 3, no. 2 (1989): 73-86.

Barrett, Justin L. *Why Would Anyone Believe in God?* : Lanham: AltaMira Press, 2004.

Bay-Cheng, Sarah, Jennifer Parker-Starbuck, and David Saltz. *Performance and Media: Taxonomies for a Changing Field*. Ann Arbor, MI: University of Michigan Press, 2015.

Beecher, Henry K. "The Powerful Placebo." *Journal of the American Medical Association* 159, no. 17 (1955): 1602-06.

Bell, Robert. "Stranger Than Fiction," *The Cornhill Magazine* 2, (1860): 221-24.

Bennett, Susan. *Theatre Audiences: A Theory of Production and Reception*. Second ed. London: Psychology Press, 1997.

Brennan, Morgan. "Magician David Copperfield's $800 Million Fortune Could Make Him a Future Billionaire." *Forbes* (2013).

Buscema, Ferdinando. "Magic, Wonder, and Ingenuity." YouTube video, from a performance at *Boing Boing: Ingenuity* on August 18, 2013. http://www.youtube.com/watch?v=RW7GYxRA2m0

Butterworth, Philip. *Magic on the Early English Stage*. Cambridge, UK: Cambridge University Press, 2005.

Byrne, Georgina. *Modern Spiritualism and the Church of England, 1850-1939*. Studies in Modern British Religious History. Woodbridge, UK: The Boydell Press, 2010.

Canby, Vincent. "A Season of Albee, Obsessions Safely Intact." *The New York Times*, 20 February 1994.

Carbonaro, Michael. "The Amazing Self-Tying Shoelaces." YouTube video, 1:11, from truTV's *The Carbonaro Effect*, March 28, 2014. http://www.youtube.com/watch?v=8BSk2GARPw0

Carroll, Noël. *The Philosophy of Horror, or, Paradoxes of the Heart*. New York: Routledge, 1990.

Casey, John. *After Lives: A Guide to Heaven, Hell, and Purgatory*. New York: Oxford University Press, 2009.

Castle, Terry. *The Female Thermometer: Eighteenth-Century Culture and the Invention of the Uncanny*. New York: Oxford University Press, 1995.

Cerullo, John J. *The Secularization of the Soul: Psychical Research in Modern Britain*. Philadelphia: Institute for the Study of Human Issues, 1982.

Clarke, Arthur C. "Hazards of Prophecy: The Failure of Imagination." *Profiles of the Future.* London: Hachette, 2013.

Cook, James W. *The Arts of Deception: Playing with Fraud in the Age of Barnum*. Cambridge, MA: Harvard University Press, 2001.

Coward, Noel. *Three Plays: Blithe Spirit, Hay Fever, Private Lives*. New York: Grove Press, 1979.

Davis, Erik. *Techgnosis*. London: Serpent's Tail, 1998.

Deleuze, Gilles, and Félix Guattari. *What Is Philosophy?* New York: Columbia University Press, 1994.

During, Simon. *Modern Enchantment : The Cultural Power of Secular Magic*. Cambridge, Mass.: Harvard University Press, 2002.

Eagleman, David. "Can We Create New Senses for Humans?" TED video, 20:34. Filmed March, 2015. http://www.ted.com/talks/david_eagleman_can_we_create_new_senses_for_humans

———. "Expanding Perceptions." YouTube video, 22:22, from TEDx Houston. Posted October 2010. http://www.youtube.com/watch?v=LENqnjZGX0A

Fiore, Faye. "A Town's 'Blair Witch' Curse." *Los Angeles Times*, May 31, 2010, http://articles.latimes.com/2010/may/31/nation/la-na-blair-witch-20100601 (accessed June 2015).

Fitzkee, Dariel. *The Trick Brain: A Thorough Handbook on the Mechanics of Magic*. 6 ed. Provo, Utah: Magic Box Productions, 2009.

Foresman, Chris. "Apple 'Screwing' New iPhones out of Simple Diy Repair." arstechnica, Jan 20, 2011. http://arstechnica.com/apple/2011/01/apple-screwing-new-iphones-out-of-simple-diy-repair/ (accessed August 2015).

Gruber, David. "From the Screen to Me, 1984-2008: Computer Television Commercials and Three Phases of the Human–Computer Relationship." *Media History* 16, no. 3 (14 June 2010): 341-56.

Gunning, Tom. "An Aesthetic of Astonishment: Early Film and the (in) Credulous Spectator." *Film theory: Critical concepts in media and cultural studies* 3 (2004): 76-95.

———. "The Cinema of Attraction." *Wide Angle* 3, no. 4 (1986).

Guthrie, Stewart Elliott. *Faces in the Clouds: A New Theory of Religion*. New York: Oxford University Press, 1995.

Haidt, Jonathan. *The Righteous Mind.* New York: Pantheon Books, 2012.

Hamilton, T. Glen. *Intention and Survival: Psychical Research Studies and the Bearing of Intentional Actions by Trance Personalities on the Problem of Human Survival*. Toronto: The MacMillan Company of Canada, Ltd., 1942.

Hass, Lawrence. *Performing Magic on the Western Stage: From the Eighteenth Century to the Present*. edited by Lawrence Hass and James Peck New York: Palgrave Macmillan, 2008.

Hertzfeld, Andy. "Reality Distortion Field." *Folklore* (blog). http://www.folklore.org/StoryView.py?story=Reality_Distortion_Field.txt

Hess, David J. *Science in the New Age: The Paranormal, Its Defenders and Debunkers*. Madison: University of Wisconsin Press, 1993.

Hines, Terence. *Pseudoscience and the Paranormal*. Prometheus Books, 2003.

Hopkins, Albert A. *Magic: Stage Illusions, Special Effects, and Trick Photography*. New York: Dover Publications, 1976.

Isaacson, Walter. *Steve Jobs*. New York: Simon & Schuster, 2011.

Jenkins, Henry. *Convergence Culture: Where Old and New Media Collide*. New York: New York University Press, 2006.

Jobs, Steve. "iPhone Introduction Keynote Speech at Macworld 2007." http://www.youtube.com/watch?v=mqylGY_YSXA, 2007.

Johnson, Steven. *Interface Culture: How New Technology Transforms the Way We Create and Communicate*. San Francisco: Basic Books, 1997.

Jones, Chris. "The Honor System." *Esquire*, 2012.

Jauss, Hans Robert. *Toward an Aesthetic of Reception.* Translated by Timothy Bahti. Minneapolis: University of Minnesota Press, 1982.

Karasek, Hellmuth. "Lokomotive Der Gefühle." Translated by Bernd Elzer. *Der Spiegel* 52 (December 12 1994): 154.

Keltner, Dacher, and Jonathan Haidt. "Approaching Awe, a Moral, Spiritual, and Aesthetic Emotion." *Cognition & Emotion* 17, no. 2 (2003): 297-314.

Kuhn, Gustav, Alym A. Amlani, and Ronald A. Rensink. "Towards a Science of Magic." *Trends in Cognitive Sciences* 12, no. 9 (2008): 349-54.

Künzel, Werner. "The Birth of the Machine: Raymundus Lullus and His Invention." http://www.c3.hu/scca/butterfly/Kunzel/synopsis.html (2006).

Kwong, David. "Two Nerdy Obsessions Meet — and It's Magic." TED video, 11:39. Filmed March, 2014. http://www.ted.com/talks/david_kwong_two_nerdy_obsessions_meet_and_it_s_magic.

Lam, Pui-Yan. “May the Force of the Operating System be with You: Macintosh Devotion as Implicit Religion.” *Sociology of Religion* 62 no. 2 (2001).

Lamont, Peter. *Extraordinary Beliefs: A Historical Approach to a Psychological Problem*. Cambridge, UK: Cambridge University Press, 2013.

———. "Spiritualism and a Mid-Victorian Crisis of Evidence." *The Historical Journal* 47, no. 04 (2004): 897-920.

Lamont, Peter, John M. Henderson, and Tim J. Smith. "When Science and Magic Meet: The Illusion of a 'Science of Magic'." *Review of General Psychology* 14, no. 1 (2010): 16-21.

Lamont, Peter, and Richard Wiseman. *Magic in Theory: An Introduction to the Theoretical and Psychological Elements of Conjuring*. Hatfield, UK: University of Hertfordshire Press, 1999.

Lehman, Amy. *Victorian Women and the Theatre of Trance: Mediums, Spiritualists and Mesmerists in Performance*. Jefferson, NC: McFarland & Company, Inc., 2009.

Lewis, E. E. "A Report of the Mysterious Noises Heard in the House of Mr. John D. Fox, in Hydesville, Arcadia, Wayne County, Authenticated by the Certificates and Confirmed by the Statements of the Citizens of That Place and Vicinity." Rochester, NY: E.E. Lewis, 1848.

Loiperdinger, Martin, and Bernd Elzer. "Lumiere's Arrival of the Train: Cinema's Founding Myth." *The Moving Image* 4, no. 1 (2004): 89-118.

Macknik, S. L., M. King, J. Randi, A. Robbins, Teller, J. Thompson, and S. Martinez-Conde. "Attention and Awareness in Stage Magic: Turning Tricks into Research." *Nature Reviews Neuroscience* 9, no. 11 (2008): 871-9.

Manovich, Lev. *The Language of New Media*. Cambridge, MA: The MIT Press, 2001.

Marquadt, Philip, Arunabh Verma, Henry Carter, and Patrick Traynor. "(Sp)iPhone: Decoding Vibrations from Nearby Keyboards Using Mobile Phone Accelerometers." Paper presented at the Proceedings of the 18th ACM Conference on Computer and Communications Security, New York, 2011.

McCabe, Joseph. *Spiritualism: A Popular History from 1847*. New York: Dodd, Mead & Company, 1920.

McConachie, Bruce A. *Engaging Audiences: A Cognitive Approach to Spectating in the Theatre*. Cognitive Studies in Literature and Performance. edited by Bruce McConachie and Blakey Vermeule. 1st ed. New York: Palgrave Macmillan, 2008.

Méliès, Georges. "En Marge De L'historie Du Cinématographe." *Ciné-Journal* (10 September 1926): 7.

Metz, Christian. *Psychoanalysis and Cinema: The Imaginary Signifier*. Translated by Celia Britton, Annwyl Williams, Ben Brewster and Alfred Guzzetti. London: MacMillan Press, 1983.

Moore, Gordon E. “Cramming More Components onto Integrated Circuits.” *Electronics* 38, (1998): 114-117.

Morris, Dee. *Boston in the Golden Age of Spiritualism: Séances, Mediums & Immortality*. Charleston, SC: The History Press, 2014.

Myrick, Daniel, and Eduardo Sanchez. "The Aftermath: The Blair Witch Project Web Site." http://blairwitch.com/evidence5.html.

Myrick, Daniel, Eduardo Sanchez, Heather Donahue, Michael Williams, Joshua Leonard, Neal Fredericks, and Antonio Cora. "The Blair Witch Project." 81 min: Artisan Entertainment, 1999.

Neale, Robert E. *Performing Magic on the Western Stage: From the Eighteenth Century to the Present*. Edited by Lawrence Hass and James Peck New York: Palgrave Macmillan, 2008.

Nelms, Henning. *Magic and Showmanship: A Handbook for Conjurers*. Mineola, NY: Dover Publications, 1969.

Noakes, Richard. "Spiritualism, Science and the Supernatural in Mid-Victorian Britain." *Cambridge Studies In Nineteenth Century Literature and Culture* 42 (2004): 23-43.

Oehler, Andrew. *The Life, Adventures, and Unparalleled Sufferings of Andrew Oehler, Containing an Account of His Travels through France, Italy, the East and West Indies, and Part of the United States; His Imprisonment in France, Germany and Spain: And the Latitude, Soil, Climate, Productions, Manners and Customs of the Different Countries*. Trenton, N.J.: D. Fenton, 1811.

Popper, Karl. *Conjectures and Refutations: The Growth of Scientific Knowledge*. London: Routledge Classics, 2014.

Robert-Houdin, Jean Eugène. *Secrets of Conjuring and Magic: Or How to Become a Wizard*. Translated by Louis Hoffman. Cambridge, UK: Cambridge University Press, 2011.

Robinson, Brett T. *Appletopia : Media Technology and the Religious Imagination of Steve Jobs*. Waco, Texas: Baylor University Press, 2013.

Schiller, Friedrich. "On Naive and Sentimental Poetry." Translated by Julius A. Elias. In *German Aesthetic and Literary Criticism: Winckelmann, Lessing, Hamann, Herder, Schiller and Goethe*, edited by H. B. Nisbet. Cambridge, UK: Cambridge University Press, 1985.

Schreier, Margrit. "Please Help Me; All I Want to Know Is: Is It Real or Not?: How Recipients View the Reality Status of the Blair Witch Project." *Poetics Today* 25, no. 2 (2004): 305-34.

Silverman, Kenneth. *Houdini!!!: The Career of Ehrich Weiss : American Self-Liberator, Europe's Eclipsing Sensation, World's Handcuff King & Prison Breaker*. New York: HarperCollins Publishers, 1996.

Sinek, Simon. *Start with Why: How Great Leaders Inspire Everyone to Take Action*. New York: Penguin, 2009.

Snickars, Pelle. *Moving Data: The iPhone and the Future of Media*. Columbia University Press, 2012.

Sofer, Andrew. "How to Do Things with Demons: Conjuring Performatives in Doctor Faustus." *Theatre Journal* 61, no. 1 (2009): 1-21.

Solomon, Matthew. *Disappearing Tricks: Silent Film, Houdini, and the New Magic of the Twentieth Century*. Urbana: University of Illinois Press, 2010.

Spiritualism, University of Pennsylvania Seybert Commission for Investigating Modern. "Preliminary Report of the Commission Appointed by the University of Pennsylvania to Investigate Modern Spiritualism, in Accordance with the Request of the Late Henry Seybert." Philadelphia: J.B. Lippincott Company, 1887.

Stevens, P. "Magical Thinking in Complementary and Alternative Medicine." *Skeptical Inquirer* 25, no. 6 (2001): 32-37.

Tamariz, Juan. *The Method of False Solutions and the Magic Way*. Seattle: Hermetic Press, 2014.

Tarbell, Harlan, Ralph W. Read, and Harry Lorayne. *The Tarbell Course in Magic*. New York: L. Tannen, 1944.

Telotte, Jay P. "The Blair Witch Project Project: Film and the Internet." *Film Quarterly* 54, no. 3 (2001): 32-39.

Tempest, Marco. "And for My Next Trick, a Robot." TED video, 06:18. Filmed 2014 http://www.ted.com/talks/marco_tempest_maybe_the_best_robot_demo_ever

———. "The Magic of Truth and Lies (and iPods)." TED video, 05:07. Filmed 2011. http://www.ted.com/talks/marco_tempest_the_magic_of_truth_and_lies_on_ipods

Thagard, Paul R. "Why Astrology Is a Pseudoscience." Paper presented at the PSA: Proceedings of the Biennial Meeting of the Philosophy of Science Association, 1978.

Thomas, Keith. *Religion and the Decline of Magic: Studies in Popular Beliefs in Sixteenth and Seventeenth Century England*. New York: Charles Scribner's Sons, 1971.

Thwaites, Thomas. *The Toaster Project*. New York: Princeton Architectural Press, 2011.

Turkle, Sherry. *Life on the Screen: Identity in the Age of the Internet.* New York: Simon and Shuster, 1995.

Tryon, Chuck. "Video from the Void: Video Spectatorship, Domestic Film Cultures, and Contemporary Horror Film." *Journal of Film and Video* 61, no. 3 (2009): 40-51.

Verbinski, Gore. "The Ring." 115 min: USA/Japan: DreamWorks SKG, MacDonald/Parkes Productions, BenderSpink, 2002.

Weber, Max. *The Sociology of Religion*. Boston: Beacon Press, 1993.

Windisch, Karl Gottlieb *Inanimate Reason: Or a Circumstantial Account of That Astonishing Piece of Mechanism*. Pater-Noster-Row, 1784.

Zimmer, Catherine. "Surveillance Cinema: Narrative between Technology and Politics." *Surveillance & Society* 8, no. 4 (2011): 427-40.