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The Scientist and American Cinema:  
Trends and Case Studies

Ciara Wardlow

Submitted in Partial Fulfillment  
of the  
Prerequisite for Honors  
in Cinema and Media Studies  
under the advisement of Dr. N. Adriana Knouf

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## TABLE OF CONTENTS

Acknowledgements.....	3
Introduction.....	4
Chapter 1: A Historical Overview of Scientists in American Film.....	12
Chapter 2: Space Science and Cinema.....	83
Chapter 3: Heroic Renegades and “Strange Birds”: Scientist Biopics.....	114
Chapter 4: The Scientist Goes to the Remakes: <i>The Thing</i> and <i>The Fly</i> .....	156
Conclusion.....	198
Bibliography.....	202

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I would also like to thank my friends and family for their support and encouragement. In particular, I would like to acknowledge my father, Jesse Wardlow, for never checking MPAA ratings before taking me to see whatever sci-fi movie was playing that week, and my mother, Brid Wardlow, for not stopping him. I genuinely think I am a more interesting person today for having seen *The Matrix* at age six.

Lastly, I would like to give a special shout-out to caffeine, for keeping me going. I wouldn't have made it without you.

## INTRODUCTION

In 1957, cultural anthropologist Margaret Mead released a pioneering study of high schoolers' perceptions of scientists that concluded that the average American high schooler imagines a scientist as an "unshaved and unkempt" glasses-wearing middle-aged man in a white lab coat with a single-minded focus on his work.<sup>1</sup> While a number of the respondents cited the importance of scientific work or spoke admirably of scientists in terms of their contributions to society, the idea that work in the sciences was isolated and pursued to the detriment of interpersonal relationships was widespread even across respondents who described scientists in more generally favorable terms.<sup>2</sup>

The findings of numerous other studies published since on the public image of scientists have overwhelmingly echoed Mead's results, even when studies use the visual "Draw-A-Scientist" test (DAST) instead of asking participants to describe a scientist in words. Numerous DAST studies over the years have repeatedly found the pervading stereotype of a scientist as an "elderly or middle-aged White male who works individually in traditional indoor laboratory settings and wears a laboratory coat and glasses while conducting dangerous experiments" dominates across study groups beginning at around 6-7 years of age, and has found to only become more firmly established with age.<sup>3</sup>

The consistency in these results begs the question of where this public image comes from. The prevalence of the practicing scientist as a public figure has ebbed and flowed over time and across cultures, but in the present-day United States the scientist has become a figure

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<sup>1</sup> Margaret Mead and Rhoads Metraux, "Image of the Scientist among High-School Students," *Science* 126, no. 3270 (1957).

<sup>2</sup> Ibid.

<sup>3</sup> Aik-Ling Tan and Jennifer Ann Jocz, "Spiderman and Science: How Students' Perceptions of Scientists Are Shaped by Popular Media," *Public Understanding of Science* 26, no. 5 (2017), 521; David Wade Chambers, "Stereotypic Images of the Scientist: The Draw-a-Scientist Test," *Science Education* 67, no. 2 (1983).

that is neither particularly heard nor seen directly. A poll done in 2010 estimated that only around 18 percent of Americans knew a scientist personally.<sup>4</sup> Considering the average American does not know a working scientist personally, and that particularly in recent years, so-called “celebrity scientists” are few and far between, the most frequent images of scientists that the typical American sees are of those of the fictional variety shown in film and television.<sup>5</sup> As A. Bowdoin Van Riper wrote in a 2003 article, “popular culture probably does more than formal science education to shape most people’s understanding of science and scientists.”<sup>6</sup> In sum, the considerable majority of the American population formulates their idea and image of the scientist more or less entirely from media sources, and the research scientist is a figure more frequently depicted in fictional contexts than news media.

While fictional media images of scientists play a significant role in shaping public attitudes and ideas of scientists and their work, these images are drawn by people who are very often drawing primarily from other fictional images.<sup>7</sup> As put by Dr. Marty Kaplan, Director of the Norman Lear Center, “When writers depict scientists, they probably do what they do in every other realm, which is draw from their own experience, and whether that experience is personal or, more likely, from other entertainment. They have seen what ‘scientists’ look like. It’s in Frankenstein movies, and in cartoons, and that helps give them a [reference] frame.”<sup>8</sup> So overwhelming numerous are the depictions of scientists as madmen (and occasionally mad women), obsessives, and social outcasts that actor Aaron Eckhart, after interacting with several geologists in preparation for his role as a scientist in *The Core*, was notably surprised to discover

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<sup>4</sup>Chris Mooney and Sheril Kirshenbaum, *Unscientific America: How Scientific Illiteracy Threatens Our Future* (Basic Books, 2009).

<sup>5</sup> Lawrence M. Krauss, "Scientists as Celebrities: Bad for Science or Good for Society?," *Bulletin of the Atomic Scientists* 71, no. 1 (2015).

<sup>6</sup> A. Bowdoin Van Riper, "What the Public Thinks It Knows About Science," *EMBO Reports* 4, no. 12 (2003).

<sup>7</sup> Kevin Grazier and Stephen Cass, *Hollyweird Science: From Quantum Quirks to the Multiverse* (Springer, 2015).

<sup>8</sup> Quoted in *ibid* 49.

that scientists are “just as concerned as you or I about everyday things.”<sup>9</sup> In sum, trends in the depictions of scientists in mainstream media such as popular film and potential connections to the public image of scientists warrant consideration.

I have fostered parallel interests in science—specifically, biology—and film since I was quite young. Though I loved movies from a very young age, I never considered them as something that could actually be *studied* until I was fourteen. I attended the Illinois Mathematics and Science Academy (IMSA), and that meant taking a week-long course in January between semesters (“Intersession”). There was a catalog of options to choose from, and that first year I excitedly chose “Infectious Disease as Portrayed in Cinema.” Two of my favorite subjects together—it seemed like a match made in heaven. Sure, I had waited excitedly for the release of Steven Soderbergh’s *Contagion* (2011) just five months prior and found myself ultimately a little underwhelmed, but I figured there had to be better examples of infectious disease in cinema out there.

I was wrong.<sup>10</sup> And for most of that week, very, very bored. But it made me wonder: *why* were they all so bad? So needlessly inaccurate? Where was the tense historical drama about John Snow investigating the Broad Street cholera outbreak? The biopic of Jonas Salk? Why was NASA the only scientific organization that got cool movies?

It was my indignation over these questions that drove me to the school library’s one-and-a-half shelves of books on film history and criticism for the first time. It was then that I began to see films as more than something just to be watched and enjoyed, that I first began to learn about how to analyze them, study them, write about them.

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<sup>9</sup> Aaron Eckhart quoted in David A. Kirby, *Lab Coats in Hollywood: Science, Scientists, and Cinema* (MIT Press, 2011), 72.

<sup>10</sup> Okay, so *The Andromeda Strain* is pretty good. But overall it was a rough week.

This thesis represents the culmination of nearly a decade of interest in the intersections between cinema and science. While I have written on numerous occasions about depictions of scientific topics and scientist characters in film for *Film School Rejects* and *The Hollywood Reporter's* Heat Vision website, where I have been a regular contributor for the past few years, these have been short articles within the realm of 700 to 2000 words or so, and as such I sought to put together a thesis investigating this topic in more depth.

As Benjamin Motz writes, “popular films are not merely cultural artifacts, but also cultural vehicles for public awareness.”<sup>11</sup> A cognitive scientist, Motz noted in a 2013 article about the portrayal of his discipline in cinema that, for example, traffic to the Wikipedia page on “Dreams” doubled in the two weeks following the release of the dream-set heist film *Inception* (2010). The potential influence of popular cinema on attitudes towards violence, for example, is a frequently recurring debate; that film could have an impact on popular opinions and understandings of science and scientists is therefore well within reason—and indeed, particularly over the past few decades, has become an increasingly popular field of study.<sup>12</sup>

The existing body of literature on this subject is far larger than I ever anticipated at 14. The “intersection between cinema and science” is not really one overlap, but many—the on-screen portrayal of scientists, the role of scientists as advisors in the film production process, the relationship between cinematic portrayals of scientific subjects and popular opinion, in influencing the development of technologies, in inspiring children and adolescents to pursue (or not pursue) scientific fields, the list goes on. To exhaustively cover any one of them, not to

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<sup>11</sup> Benjamin Motz, "Cognitive Science in Popular Film: The Cognitive Science Movie Index," *Trends in Cognitive Sciences* 17, no. 10 (2013).

<sup>12</sup> Shari Laprise and Chuck Winrich, "The Impact of Science Fiction Films on Student Interest in Science," *Journal of College Science Teaching* 40, no. 2 (2010); Mike Berry, Tim Gray, and Ed Donnerstein, "Cutting Film Violence: Effects on Perceptions, Enjoyment, and Arousal," *The Journal of Social Psychology* 139, no. 5 (1999); Tan and Jocz, "Spiderman and Science: How Students' Perceptions of Scientists Are Shaped by Popular Media."



mention the sum total, would well exceed the bounds of an undergraduate thesis. With this consideration in mind, I sought to craft a thesis that both gave a sense of the bigger picture in regard to the interplay between cinema and scientists, both real and on-screen, and featured close analysis of films to demonstrate how these dynamics work in specific, individual contexts.

In addressing the image of the scientist in cinema, it is important to first address trends in the image of scientists in fiction pre-dating the origins of film. Just as many individual films are adapted from other media, such as literary works, much of the image of the scientist as seen in fiction film is rooted in older works, and especially many of the negative stereotypes that plague the film image of the scientist far predate film—and the term “scientist.” From the biblical notion of the “forbidden fruit” of knowledge to the legend of Faust(us) and even Mary Shelley’s seminal novel *Frankenstein* 1818, the roots of the mad/amoral scientist stereotype were well established by the time the term “scientist” came into use around 1840, replacing “natural philosopher.”<sup>13</sup>

The “mad scientist” archetype with many variants. For my purposes, a “mad scientist” is any character, defined as a scientist by the criteria given above, who fits into any one of the following three scientist “images” defined by Roslynn Haynes, who sources all of their origins to the 18<sup>th</sup> century or earlier, and therefore well before the introduction of cinema at the dawn of the 19<sup>th</sup> century:

1. **The alchemist**, “who seeks arcane forbidden knowledge, works in secret or alone with a single assistant, [and] is driven by a mania for power or gold.”

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<sup>13</sup> Allen, Glen Scott. “Master Mechanics & Evil Wizards: Science and the American Imagination from Frankenstein to Sputnik,” *The Massachusetts Review* vol. 33 no. 4 (1992), 505-558; Mary Shelley, *Frankenstein: Annotated for Scientists, Engineers, and Creators of All Kind* (MIT Press, 2017); Christopher P. Toumey, “The Moral Character of Mad Scientists: A Cultural Critique of Science,” *Science, Technology, & Human Values* 17, no. 4 (1992), 417-418, provides a general overview of the many lineages of the Faust/Doctor Faustus legend.

2. **The absent-minded professor**, “who is so obsessed with the single-minded pursuit of a tiny branch of knowledge—whether or not it is useful—that he neglects his social or domestic responsibilities.” For my purposes, I expand “tiny branch of knowledge” to also include the single-minded pursuit of developing a particular technology, e.g. Doc Brown and his time machine from the *Back to the Future* series.
3. **The inhuman rationalist**, “who has suppressed human affections and emotions in the cause of detached scientific enquiry—or value neutrality—and who ignores the wider moral dimensions of the results.”<sup>14</sup>

While Mary Shelley’s *Frankenstein* might be the most famous mad scientist of them all, Nathaniel Hawthorne did much to instill a particular image of the scientist in American popular culture, writing a number of morality tales featuring “men of science” as obsessive types, whose obsession turn into downward, destructive spirals of isolation and dehumanization. As literary historian Taylor Stoehr writes, “Hawthorne's stock figure ... is an isolated man whose mentality and special pursuits tear him away from the warmth of (usually female) society until he hardens into a frozen or petrified monster... In Hawthorne's work clinical detachment ... is always a symptom of moral disease.”<sup>15</sup> This particular “downwards spiral” narrative, as well as the notion of scientific practice and the development and maintenance of healthy interpersonal relationships being mutually exclusive, is one of the most pervasive elements across cinematic depictions of scientists, as this thesis will explore at length.

However, defining a “mad scientist” still leaves an even more fundamental question unanswered: what is a scientist? As the lines between physician/scientist/engineer/mathematician

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<sup>14</sup> Roslynn D. Haynes, *From Faust to Strangelove: Representations of the Scientist in Western Literature* (Baltimore: Johns Hopkins University Press, 1994), 27.

<sup>15</sup> Taylor Stoehr quoted in Glen Scott Allen, “Master Mechanics & Evil Wizards: Science and the American Imagination from *Frankenstein* to *Sputnik*,” *The Massachusetts Review* 33, no. 4 (1992), 513.

are quite often blurred—or utterly non-existent—in cinematic depictions, for my purposes a “scientist” includes any character who is identified as a “scientist” (or a specialized term that falls under the “scientist” umbrella: botanist, chemist, physicist, etc.) by other characters and/or in promotional materials or, in situations where no such labels are ever clearly stated, the character is depicted as engaging in *experimental* processes rooted in STEM knowledge, whether that be the development of a formula or the creation of a robot.

While I sought to include both broad overview and detailed film analysis in this thesis, certain concessions had to be made in the name of feasibility. For instance, some terms, such as “image” and “depiction,” are used interchangeably for the sake of readability and narrative flow. While I tried to make my thesis as inclusive as possible and, in my overview chapter, feature as many films as possible, my survey remains far from exhaustive. There are only so many films one can watch in a day.

Chapter one of this thesis provides an overview of the history of scientist characters in theatrically-released American cinema, providing the wider context of cinematic trends on a decade-by-decade basis, from the “golden age” of horror in the 1930s to the superhero era of the 2010s, as well as major scientific and technological developments and other prominent science-related news stories to elucidate the nature of the public image of science over time. Throughout this chapter, priority is given to films featuring scientist characters that were among the top-grossing of their release years (U.S. Domestic Box Office) as well as films featuring science characters included in the National Film Registry.

Chapter two looks at the relationship between cinema and real-world scientific developments in the case of space science and the history of the National Aeronautics and Space Administration (NASA), concluding in an analysis of the five theatrically-released NASA

history dramas that have been made to date: : *The Right Stuff* (1983), *Apollo 13* (1995), *October Sky* (1999), *Hidden Figures* (2016), and *First Man* (2018). Chapter three approaches the interplay between mainstream cinema and the public memory and popular opinion of scientists through the history of biographical films made about scientists, beginning with a general overview and culminating in analyses of six key films within this category: *The Story of Louis Pasteur* (1936), *Edison, The Man* (1940), *Dr. Ehrlich's Magic Bullet* (1940), *A Beautiful Mind* (2001), *The Theory of Everything* (2014), *The Imitation Game* (2014). Finally, chapter four investigates the evolution of scientist characters in film through the parallel examples of two short stories, "Who Goes There?" and "The Fly," their corresponding 1950s film adaptations, and subsequent 1980s reboots.

## Chapter One

### **A Historical Overview of Scientists in American Film, 1931 to Present**

Scientist characters existed in cinema prior to the dawn of the sound era, but it was in the 1930s that the trajectory of the scientist figure in *American* cinema truly began in earnest. Prior to this decade, the most influential scientist figures on screen were European imports, ranging from the not-what-he-seems Dr. Caligari of *The Cabinet of Dr. Caligari* to the wild-haired, villainous inventor Rotwang of *Metropolis* (1929). Though several scientist characters from the silent era left lasting legacies, language and dialogue have played notable roles in the unique identity of the scientist as depicted on screen, and as such makes the 1930s a better starting point, as all the films being examined have the same basic *audiovisual* form.

While the role of science and scientists in fiction film, both as characters and behind the scenes as technical advisors, has started to become subject to more study in the past few decades, the majority of these analyses have singled out particular narratives (e.g. Frankenstein), archetypes (the “mad scientist”), or narrowed their focus to a particular genre, usually science fiction or horror. The goal of this chapter is to look at the evolution of scientists as depicted in American cinema from 1931 to present, with “American cinema” defined as feature-length films that received wide theatrical release in the United States. As such, a handful of British productions that received wide theatrical release in the U.S. are also addressed in this thesis (e.g. *The Curse of Frankenstein*).

In addition to looking at the trends and evolutions visible within the selected films, this chapter will look at the correlation or lack thereof with contemporaneous major events in the history of science as well as the history of *popular* science—that is, both the history of major

developments within the scientific community and the history of science as depicted in news media and the popular press.

Speaking of film genres, Vivian Sobchack notes the presence of “elements of visual content” that “appear again and again in film after film, [and so] have become visual conventions or icons, pictorial codes which are graphic shorthand understood by both filmmaker and audience.”<sup>16</sup> While she writes specifically of trends *within* specific film genres, visual elements as well as narrative tropes have become similarly conventional across cinematic representations of scientists, but in a way that crosses all boundaries of genre, as this chapter will explore.

On the subject of genre, however, it is notable that scientist characters are predominantly found in films categorized as horror or science-fiction. In one of the largest quantitative studies of horror films to date, for instance, Andrew Tudor found through a content analysis of 990 titles belonging within the genre produced between 1931 and 1984 that the most common source of “horror” came in the form of threats generated by “science,” as featured in 25% of the films he studied.<sup>17</sup>

This chapter represents a wide, general overview of the history of movie scientists in American cinema. As it covers nearly the entirety of the sound era—1931 to present—it is painted in broad strokes and is by no means an exhaustive account. It seeks to provide context for later chapters by highlighting how scientist characters have featured in major trends in American cinema over the decades, as well as trends within the depiction of these characters. As the complex relationship between real-life scientific practice and mainstream cinema very much travels in both directions, several instances of cinematic impact on the development and/or news

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<sup>16</sup> Vivian Sobchack, *Screening Space: The American Science Fiction Film*, 2nd ed. (New Brunswick: Rutgers University Press, 1999), 65.

<sup>17</sup> Andrew Tudor, "Seeing the Worst Side of Science," *Nature* 340 (1989).

media coverage of real science are also noted. At least one film per decade is analyzed at some length to provide specific examples of the wider trends noted in each section.

The bulk of the films receiving detailed analysis were chosen because they either have been selected for the National Film Registry, and therefore deemed “culturally, historically, or aesthetically significant” to American film heritage, or because the film was among the top 15 grossing films (U.S. domestic box office) of its year. A handful of films not meeting these criteria were chosen because they are subject to significant commentary in literature for their depictions of science and scientists, such as *The Andromeda Strain* (1971), or hold particular cultural significance in other regards, such as the 2018 Academy Award for Best Picture winner, *The Shape of Water*.

### **The 1930s: Mad Movie Scientists and Real-Life Science Heroes**

The excitement generated by the introduction of sound to film in the late 1920s kept Hollywood from being impacted by the Great Depression at first, with weekly cinema attendance rates even hitting an all-time high in 1930 of 80 million people, but decline set in in 1931. Of the major studios, only MGM actually managed to remain profitable, though those profits were a small fraction of what they had seen in previous years.<sup>18</sup> That is not to say, however, that particular *films* were not profitable. The year 1931 might have been a difficult one for Hollywood overall, but it was a banner year for one genre: horror. Starting in February (Valentine’s Day, to be exact) with Tod Browning’s *Dracula*, the year rounded out with James Whale’s *Frankenstein* and Rouben Mamoulian’s *Dr. Jekyll and Mr. Hyde* in October and

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<sup>18</sup> David Eldridge, *American Culture in the 1930s*, Twentieth-Century American Culture (Edinburgh: Edinburgh University Press, 2008), 65.

December, respectively. This trio of major box-offices successes adapted from 19<sup>th</sup> century gothic fiction “[mark] the beginning of the horror genre as we understand it today.”<sup>19</sup>

None of them were the first film adaptations of their respective tales (nor the last), but all proved to be definitive.<sup>20</sup> And if, as is widely considered, they are the foundation on which American horror films were built, it is worth noting how prominently scientists feature in this foundation: two of the three films feature scientists—specifically, mad scientists, but more on that later—as titular characters, and the third has a scientist, Professor Van Helsing, in a significant supporting role.

While Universal Studios founder Carl Laemmle, Sr. was originally hesitant about *Frankenstein*, a passion project for his son, Carl Laemmle, Jr., he couldn’t argue with the results, publishing an article in an industry publication that named the film “the best thing that happened to the trade” in 1931 and calling it “the outstanding moneymaker of the year.”<sup>21</sup> As such, it is hardly surprising that a flood of mad scientist films ensued.

Beyond mad scientist horror films, the most prominent trend of the decade involving movie scientists came in a wave of scientist-hero biopics that followed the resounding critical and commercial success of *The Story of Louis Pasteur* (1936).<sup>22</sup> This particular trend, and the general history of biographical films of scientists, will be explored at length in chapter 3.

Both the mad scientist and the scientist-hero trends can be traced back to 19<sup>th</sup> century trends in literature and culture more broadly. The movie mad scientist of the 1930s is a direct descendant of gothic literature, both in the case of those characters directly adapted from 19<sup>th</sup>

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<sup>19</sup> Alison Peirse, *After Dracula: The 1930s Horror Film* (New York: I. B. Tauris, 2013), 1.

<sup>20</sup> Stephen Prince, "Introduction," in *The Horror Film*, ed. Stephen Prince (New Brunswick: Rutgers University Press, 2004), 6; Isabel Cristina Pinedo, "Postmodern Elements of the Contemporary Horror Film," *ibid* 89.

<sup>21</sup> Carl Laemmle Sr., "You Want Me to Be Honest," *Cinema News and Property Gazette*, January 6 1932.

<sup>22</sup> The scientist biopic subgenre will only be briefly touched on here, as it will be explored at greater length in chapter 3.



century tales and those who merely follow an archetypal pattern seen in works like Shelley's *Frankenstein*, H. G. Wells' *The Invisible Man*, and the downward spiral narrative popular in the works of Hawthorne.

As Christopher Toumey writes, "the mad scientist stories of fiction and film are homilies on the evil of science."<sup>23</sup> Maintaining the same moral lesson of the story of Adam and Eve in the Garden of Eden, these films involve men—and very occasionally women, but overwhelmingly men—who seek forbidden knowledge, and in attaining it, sow the seeds of their own destruction. They inevitably culminate in the object lesson that "there are some things man is not meant to know." As Peter Biskind writes,

When it comes to mad scientist films, and particularly mad scientist films of the 1930s, the scientist almost always dies as punishment for his sins, unless, like in the case of *Frankenstein* (1931), he is needed alive for a sequel.<sup>24</sup> As Peter Biskind writes, "to understand the ideology of films, it is essential to ask who lives happily ever after and who dies, who falls ill and who recovers, who strikes it rich and who loses everything, who benefits and who pays—and why."<sup>25</sup>

Meanwhile, the lionizing scientist biopic represents a heroic characterization of scientists and scientific practice that came of age in the 19<sup>th</sup> century and continued strong in the early 20<sup>th</sup>. Within American culture and society there was a pervasive feeling that the discipline and analytical thinking required for scientific endeavors fostered and maintained both moral and

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<sup>23</sup> Toumey, "The Moral Character of Mad Scientists: A Cultural Critique of Science," 411.

<sup>24</sup> James Whale, "Frankenstein," (Universal Pictures, 1931); "Bride of Frankenstein," (Universal Pictures, 1935).

<sup>25</sup> Peter Biskind, *Seeing Is Believing: How Hollywood Taught Us to Stop Worrying and Love the Fifties* (New York: Henry Holt and Company, 1983), 3.

intellectual growth, and scientific activities such as the collection and categorization of plant specimens (amateur botany) were quite popular among both children and adults.<sup>26</sup>

Following this line of thinking, those individuals who dedicate their lives entirely to science were then often framed as possessing a particular moral superiority. Specifically, a moral superiority connected to the veneration of objectivity and rationality. Just prior to World War II, the economist Wesley C. Mitchell summarized this line of thinking when he made the case that scientists were the only group of people to ever succeed “in emancipating themselves from the misconceptions and prejudices prevailing in their social groups.”<sup>27</sup> As John C. Burnham comments in his history of science popularization in the United States, “the moral superiority of the man of science therefore rested upon his denial of self—foreswearing both subjective emotion and personal advantage.”<sup>28</sup>

The public prestige of scientists flourished in the 1920s, a trend which science historian Peter J. Kuznick links to the “close identification in the public mind between the prosperity of the 1920s” and science.<sup>29</sup> In being considered conducive to profitability, more and more scientists were employed in the private sector, including 70% of chemists.<sup>30</sup> This commercialization of science (and scientists) hardly suited the image of the self-denying, martyr-like man of science—a conflict that would, in time, end up playing out repeatedly on the big screen, but not for a few decades yet.

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<sup>26</sup> Elizabeth B. Keeney, *The Botanizers: Amateur Scientists in Nineteenth-Century America* (Chapel Hill: University of North Carolina Press, 1992), 38-50.

<sup>27</sup> Wesley C. Mitchell, "The Public Relations of Science," *Science* 90 (1939).

<sup>28</sup> John C. Burnham, *How Superstition Won and Science Lost: Popularizing Science and Health in the United States* (New Brunswick: Rutgers University Press, 1987), 31.

<sup>29</sup> Peter Kuznick quoted in David J. Skal, *Screams of Reason: Mad Science and Modern Culture* (New York: W. W. Norton, 1998), 109.

<sup>30</sup> *Ibid.*

Throughout the 1930s, movie scientists were still overwhelmingly depicted as independent, and frequently isolated, individuals, regardless of whether they are making monsters or trying to single-handedly save the world. They are depicted as being self-directed in their research, with attempts to restrict or redirect their work by others universally rejected. In the case of mad scientist films, these others are depicted as well-meaning, rational individuals attempting to save the mad scientists from themselves; in the case of scientist-hero biopics, they are the small-minded “establishment” that presents the obstacle the scientist-hero must overcome for the sake of the greater good.

While the perceived independence of scientists as depicted in film would soon disappear, many of the key themes and characterizations regarding scientists found in 1930s films continue to echo to this day. One such trend involves scientist characters and humor—specifically, that they have no sense of one. Admittedly, having scientist characters serve as comic relief was not all that unusual in the 1930s. The prim and argumentative paleontologist Arthur B. Lovett serves as one half of a quarrelsome comedic relief duo in Frank Capra’s fantasy drama *Lost Horizon* (1937).<sup>31</sup> The very next year, another on-screen paleontologist is played for laughs in Howard Hawks’ *Bringing Up Baby*, which revolves around the hapless Dr. David Huxley and the misfortunes that befall him after he catches the eye of free-spirited heiress and trouble magnet Susan Vance. However, in both cases the comedy comes not from the scientists’ senses of humor, but their lack thereof. Neither paleontologist is much of a jokester; in fact, they are both quite humorless and socially oblivious in general, which is precisely where the comedic value of their characters is found: their poor social skills and general disconnect from the world beyond their fossils.

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<sup>31</sup> Frank Capra, "Lost Horizon," (Columbia Pictures, 1937).

While overall the 1930s codified the trend of the humorless movie scientist that remains largely pervasive, the decade also provides one of the greatest exceptions to this general rule with the mad scientist film *The Invisible Man* (1933).<sup>32</sup> Directed by James Whale in between *Frankenstein* and *Bride of Frankenstein* (1935), the film fits the mad scientist movie formula like a glove in most respects. Adapted from a 19<sup>th</sup> century source like so many 1930s horror films (H. G. Wells' 1897 novel of the same name), it follows the obsessive chemist Jack Griffin who secretly develops an invisibility serum using a mysterious plant-derived compound known as monocaine, driven to work through all hours of the night by dreams of fame and fortune. He pulls away from society, including his fiancée Flora, the daughter of his employer, Dr. Cranley. In his hubris, Griffin jumps the gun and tests the serum on himself, rendering himself invisible and leaving him scrambling to find an antidote, all the while unaware that monocaine causes madness in those exposed to it—which is precisely what happens to Griffin in a most spectacular fashion.

He abandons his quest for a cure and embraces his invisibility to pursue chaos and destruction with an ultimate goal of world domination, terrorizing unsuspecting villagers and going on a murder spree, quipping all the while. Griffin's insanity is undeniable, but so is his wit. A woman fleeing in terror from a pair of pants seemingly walking on their own and singing the nursery rhyme "Nuts in May," for instance, is genuinely comical, and the song choice adds an extra none-so-subtle emphasis on Griffin's mad scientist status.<sup>33</sup> As mentioned, scientist characters have regularly been played for laughs from the 1930s onwards, but they overwhelming are comedic figures in spite of themselves. Griffin is an outlier in that he is

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<sup>32</sup> James Whale, "The Invisible Man," (Universal Pictures, 1933).

<sup>33</sup> Coincidentally, *Lost Horizon* also features a scene in which its scientist, Arthur Lovett, whistles the tune of "Nuts in May."

intentionally entertaining—that is, witty—instead of being the butt of the joke. As film historian Carlos Clarens writes, *The Invisible Man* “contains some of the best dialogue ever written for a fantastic film,” and it is the mad scientist himself who has all the best lines.<sup>34</sup>

Horror films started to go on the decline in the latter half of the decade, though scattered mad scientist horror films would continue to be made into the early 1940s in lesser numbers. While there were a number of factors involved in this trend, one of the most prominent was the establishment of the Production Code Administration (PCA) in July 1934 under the guidance of Joseph Breen.<sup>35</sup> While the morality-minded Production Code itself was created four years earlier by the Motion Picture Producers and Distributors of America (MPPDA) president Will Hays, studios were largely allowed to self-govern in terms of content prior to the introduction of the PCA. Starting in 1934, new films were required to get a PCA seal of approval in order to qualify for distribution. Working with the motto that “no picture shall be produced which will lower the standards of those who see it,” the PCA’s code, further expanded from Hays’ original guidelines, forbid anything they deemed obscene, profane, or blasphemous.<sup>36</sup> Unsurprisingly, mad scientist fare did not fare well under this regime.

However, it was in the midst of the mad scientist decline in the latter 1930s that the scientist-hero biopic emerged following the hugely unexpected critical and commercial success of *The Story of Louis Pasteur* (1936), the first feature-length film ever made about the life of a historical scientist. This trend of lionizing scientist biopics would continue into the early 1940s, and will be further explored in chapter 3.

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<sup>34</sup> Carlos Clarens, "Children of the Night," in *The Horror Film*, ed. Stephen Prince (New Brunswick: Rutgers University Press, 2004), 63.

<sup>35</sup> David Kirby, "Harnessing the Persuasive Power of Narrative: Science, Storytelling, and Movie Censorship, 1930–1968," *Science in Context* 31, no. 1 (2018).

<sup>36</sup> Quoted in Peirse, *After Dracula: The 1930s Horror Film*, 153.

Regarding demographics, 1930s movie scientists are almost exclusively white men.<sup>37</sup> A few mad scientists are depicted as Asian, though these performances were usually done by white actors wearing yellow face—a trend that continues into the 1980s, with white actors playing white-Asian biracial scientists, such as the titular characters of *Dr. No* (1962) and *The Adventures of Buckaroo Banzai Across the 8<sup>th</sup> Dimension* (1984).

Women scientists—specifically, white women scientists—are not considered an impossibility in 1930s films, though they are decidedly rare, and, once again, overwhelmingly white. In an early scene in *Frankenstein* (1931), for instance, a few women are shown interspersed amongst an audience of students attending a lecture at Goldstadt Medical College, with the white lab coat wearing professor Dr. Waldman addressing the group as “ladies and gentlemen.”<sup>38</sup> In another mad scientist film from the decade, *The Devil-Doll* (1936), the madness is a folie à deux between Marcel and his wife, Malita, both depicted as chemists. This couple is also noteworthy for being one of the only depictions of a mad scientist in an affectionate marriage.<sup>39</sup>

One characteristic of the movie scientist well established in the 1930s that remains prominent to this day is the concept of the asexual or sexually deviant scientist, with deviance usually manifesting as unrequited obsession, a narrative trope that will be further explored in the specific context of Dr. Carrington, the main scientist character in *The Thing from Another World* (1951). Generally, when mad scientist characters are depicted in relationships—either married or engaged to be married—their scientific exploits and their relationships with their supposed

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<sup>37</sup> It will not be until the 1990s that the overwhelming whiteness of movie scientists will show any signs of changing.

<sup>38</sup> Whale, "Frankenstein."

<sup>39</sup> At least, for the 14 minutes of the film before Marcel collapses of a heart attack and dies. Tod Browning, "The Devil-Doll," (Metro-Goldwyn-Mayer, 1936).

significant others are overwhelmingly depicted as being in direct conflict. In the case of married mad scientists, their neglected wives are often part of a romantic subplot, but it is not their spouse who serves as the love interest. Instead, some other suitor fills that role, yearning from the sidelines until her uncaring and emotionally distant husband's death at the end of the film opens up the possibility for the two to finally get together in a socially-sanctioned way. Sex and science are overwhelmingly positioned at opposite ends of the spectrum, and scientist characters can pick one or the other but not both.<sup>40</sup>

A third smaller science-related trend tied to the scientist biopic boom can be seen a group of "outbreak films"—a group in which two prominent scientist biopics, *The Story of Louis Pasteur* (1936) and *Dr. Ehrlich's Magic Bullet* (1940) can both also be placed. The basic structure of an outbreak film involves a medical expert (though much more commonly a local country doctor—as in physician—as opposed to a research scientist) seeks to control/eliminate an infectious disease outbreak. *The Citadel* (1939), for instance, depicts an idealistic doctor fighting tuberculosis in a mining town. In *Dr. Bull* (1933), a small-town physician deals with a typhoid epidemic. While several of these outbreak films proved quite successful with audiences, they largely disappeared in the 1940s. Two attempts to bring back the outbreak film in 1950, *The Killer That Stalked New York* and *Panic in the Streets*, did not fare particularly well at the box office, but the subgenre has since seen two resurrections as part of the disaster film booms of the 1970s and 1990s, which will be discussed at length later in this chapter.<sup>41</sup>

Scientist characters did appear in 1930s films outside of these three trends, albeit less often, in everything ranging from romantic dramas (*Blonde Venus*, 1932; *Dark Victory*, 1939) to

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<sup>40</sup> With the exception of scientist biopics, in which the love of faithful and supportive wives feature prominently in order to underline the subjects' humanity.

<sup>41</sup> Georgios Pappas et al., "Infectious Diseases in Cinema: Virus Hunters and Killer Microbes," *Clinical Infectious Diseases* 37 (2003).

screwball comedies (*Bringing Up Baby*, 1938) to musicals (*The Gay Divorcee*, 1934), but the narrative tropes and iconography of scientist characters cross all borders of genre. For instance, in “fallen woman” melodrama *Blonde Venus*, the relationship troubles between Helen and chemist husband Ned source from radiation poisoning he received through his work—which he must frequently bring home, as their house is full of test tubes and beakers.<sup>42</sup>

Ned’s salary is not enough to cover the cost of the only life-saving treatment available, requiring Helen to return to work as a nightclub singer to both cover his medical costs and support the family while her husband is in treatment. It is through this work, and especially once Ned must leave his family for several weeks in order to undergo this treatment, that Helen succumbs to the charms of a wealthy and devilish politician subtly named Nick. While the film’s ending indicates that Helen and Ned reconcile, the plot still ultimately plays into the notion of a fundamental tension between scientific pursuits and interpersonal—and especially, romantic—relationships. The plot of *Bringing up Baby* also relies on this presumption; when paleontologist David Huxley, in contrast to the average mad movie scientist, chooses romance over his work, he finally succumbs to Susan Vance’s romantic pursuit of him in a scene which culminates in her literally toppling the *Brontosaurus* skeleton that represents his life’s work.<sup>43</sup>

### **The 1940s: A transition period**

The best starting place for discussing the 1940s culture is September 1, 1939, when Adolf Hitler sparked World War II with the invasion of Poland. Culturally, the 1940s are better understood as two half-decades split down the middle at 1945 with the death of President Franklin D. Roosevelt and the ending of World War II, a general divide also starkly apparent in

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<sup>42</sup> Josef von Sternberg, "Blonde Venus," (Paramount Pictures, 1932).

<sup>43</sup> Howard Hawks, "Bringing up Baby," (RKO Radio Pictures, 1938).



looking at cinematic trends.<sup>44</sup> The war effort dominated wartime cinema as it did practically all other aspects of American life. Prior to the attack on Pearl Harbor, Hollywood films overwhelmingly avoided addressing the war, especially in any way that could be construed as promoting U.S. involvement.

There were a few exceptions to this general trend, most notably Charlie Chaplin's *The Great Dictator* and *The Mortal Storm* (both 1940), but they were few and far between. However, as soon as the United States entered the war, Hollywood quickly joined the cause. In addition to straightforward propaganda and standard combat-focused war films, every genre from crime thriller to romantic melodrama to musical was co-opted to lionize the war effort. By mid-1942, approximately a third of all films in production dealt directly with the war.<sup>45</sup>

In terms of on-screen film presence, the 1940s mark a low point for scientists. The "mad scientist" horror movie trend popularized in the 1930s continued, but mostly as B picture fare, made quickly and cheaply and often featuring highly derivative storylines. Paramount released the only color mad scientist film of the decade, *Dr. Cyclops*, in 1940. The Technicolor production was also the last mad scientist film to be allotted a major marketing campaign as seen in contemporaneous industry publications.<sup>46</sup>

Meanwhile, Universal rehashed its 1930s horror icons in mashups like *Frankenstein Meets the Wolf Man* (1943) and *House of Dracula* (1945). While neither Bela Lugosi nor Boris Karloff's career-making performances were mad scientists, they both overwhelmingly took on this role throughout the 1940s in numerous low-budget horror films made both at major studios

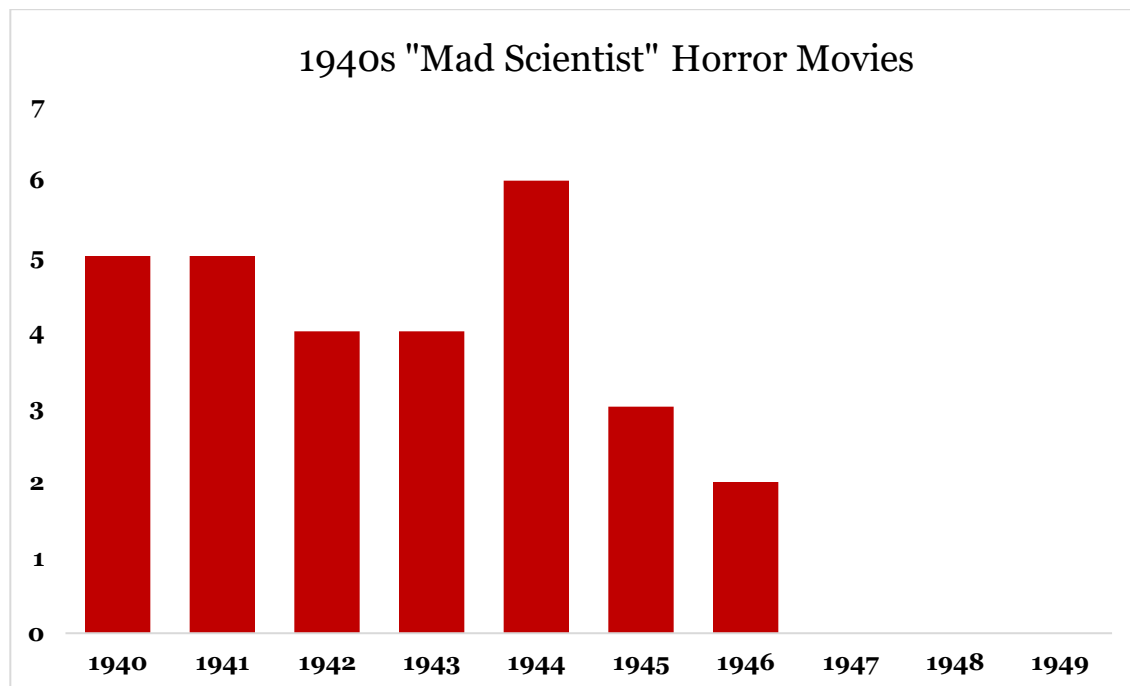
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<sup>44</sup> William Graebner, *The Age of Doubt: American Thought and Culture in the 1940s* (Boston: Twayne Publishers, 1991), 1.

<sup>45</sup> Thomas Schatz, *Boom and Bust: The American Cinema in the 1940s* (New York: Charles Scribner's Sons, 1997), 204.

<sup>46</sup> "Half a Dozen Proofs Why Paramount's 'Dr. Cyclops' Will Give Your Theatre That Magic Shot in the Arm That Spells Healthy Box Office!," *Box Office*, 23 March 1940; "Paramount Shoots the Works to Give You These 3 Spring Smashes," *Motion Picture Herald*, 10 February 1940.

and at various so-called “Poverty Row” studios that exclusively produced B-films such as the Producers Releasing Corporation (PRC) and Monogram Pictures.



**Figure 1.** Number of “mad scientist” horror movies released per year, 1940-1949, as featured in the weekly motion picture trade journal *Harrison’s Reports*.

By the middle of the decade, mad scientist movies had become cliché to a point of parody in film-related publications. “Oh my gawd, here’s another nutty scientist, can you believe it?” begins the review of PRC’s *The Monster Maker* (1944) published in the movie magazine *Photoplay*, which concludes with an exasperated, “really, there should be a law.”<sup>47</sup> While no law was passed, the anonymous reviewer’s qualms clearly reflected a common mentality, as by 1947, the mad scientist horror film disappeared. As a stock figure, the mad scientist did still show up on occasion—but in comedic contexts, most notably *Abbott and Costello Meet Frankenstein* (1948). The scientist biopic boom kickstarted by *The Story of Louis Pasteur* also continued in

<sup>47</sup> “The Monster Maker (P.R.C.),” *Photoplay*, June 1944.

the 1940s, with one of the biggest entries being *Madam Curie*, starring wartime box office queen Greer Garson and her usual screen partner Walter Pidgeon at the height of their popularity.<sup>48</sup>

In science and technology news, the 1940s featured major developments in aerospace engineering, including the helicopter, the long-range rocket, and the breaking of the sound barrier. Many of these developments were made in military contexts over the course of World War II, which also saw the development of radar technologies. In the life sciences, a team of scientists at the Rockefeller Institute identified nucleic acids (not proteins) as the cellular component that determined inherited characteristics in 1944. The pre-dawn of the Computer Age arrived with the creation of the IBM Automatic Sequence Controlled Calculator (a.k.a. the Harvard Mark 1), demonstrated at Harvard in 1943 and in use by the U.S. Navy by the following year—the same year British mathematician and computer scientist Alan Turing developed the Colossus computer that cracked the German Enigma code. The biggest development of all, however, in terms of both media coverage and prominence in public discourse, was the development of the atomic bomb. In 1942, Enrico Fermi achieved the first controlled atomic chain reaction; less than a month later, President Franklin D. Roosevelt dedicated \$400 million to the top-secret Manhattan Project.<sup>49</sup>

The role of scientists, particularly via the Manhattan Project and the creation of the atomic bomb, dominated the press in the immediate aftermath of WWII, and were widely lionized as heroes.<sup>50</sup> Scientists became “the darlings of the American intellectual and cultural scene” and were overwhelmingly lauded in the press.<sup>51</sup> A cartoon published in the Chicago

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<sup>48</sup> *Boom and Bust: The American Cinema in the 1940s*, 209-211.

<sup>49</sup> "The 1940s Science and Technology: Topics in the News," in *Uxl American Decades*, ed. Julie L. Carnagie, et al., 1940-1949 (Detroit, MI: UXL, 2003).

<sup>50</sup> Joyce A. Evans, *Celluloid Mushroom Clouds: Hollywood and the Atomic Bomb* (Boulder: Westview Press, 1998), 34.

<sup>51</sup> Jacqueline Foertsch, *American Culture in the 1940s*, Twentieth-Century American Culture (Edinburgh: Edinburgh University Press, 2008), 19-20.

Tribune on August 11, 1945, for example, depicted the “U.S. Fighting Man” holding a flag of victory standing atop a pedestal labelled “SCIENCE.”<sup>52</sup> That the atom bomb was widely seen as first and foremost an American victory with little thought to the potential of the technology presenting a future safety threat is further evidenced by the prominent benign use of “atom,” “atomic,” and other nuclear key words in popular culture contexts in the first few years following the war, such as the popular songs “Atom Buster,” “Atom Polka,” and “Atom Bomb Baby.” While dissenters began raising the alarm with concerns shortly after the first atomic bomb was dropped in 1945, the popular sentiment would not overwhelmingly begin to sour against atomic weaponry until the Soviet Union displayed their nuclear capabilities by detonating an atomic device in 1949.<sup>53</sup>

The first film to capitalize on the atom bomb, *First Yank in Tokyo*, premiered just a month after the bombings of Hiroshima and Nagasaki, but any atomic anxieties manifested by these first post-war films were not laid at the feet of scientists. *First Yank in Tokyo*, for example, revolves around a U.S. soldier sent to rescue a captured nuclear scientist from a Japanese prison camp. *Shadow of Terror*, released just a month later, features a similarly victimized nuclear scientist on the run from a foreign agent seeking to steal atomic bomb secrets from him.<sup>54</sup> The 1946 film *Danger Woman* centers around a nuclear physicist researching “the development of atomic energy for peacetime use,” but narratively his work takes the backseat to a love triangle between the professor, his secretary, and his recently returned estranged wife.<sup>55</sup>

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<sup>52</sup> Allen, “Master Mechanics & Evil Wizards: Science and the American Imagination from Frankenstein to Sputnik,” 507.

<sup>53</sup> “The 1940s Science and Technology: Topics in the News.”; Evans, *Celluloid Mushroom Clouds: Hollywood and the Atomic Bomb*, 4-5.

<sup>54</sup> “‘Shadow of Terror’ with Richard Fraser and Grac Gillern,” *Harrison’s Reports*, 6 October 1945.

<sup>55</sup> “‘Danger Woman’ with Don Porter and Brenda Joyce,” *Harrison’s Reports*, 13 July 1946; Gordon Douglas, ‘First Yank in Tokyo,’ (RKO Radio Pictures, 1945); Lew Landers, ‘Shadow of Terror,’ (Producers Releasing Corporation, 1945).

However, another 1946 release points to a potential change in the air. The 20<sup>th</sup> Century Fox spy thriller *Rendezvous 24* once again involves the safekeeping of nuclear secrets, but this time the “American” scientist himself proves to be the foreign agent who must be stopped. Overall, the late 1940s cluster of “atomic espionage” films overall emphasize the scientist as hero rather than scientist as villains: *Cloak and Dagger* (1946) stars Gary Cooper as a heroic nuclear physicist drafted into the O.S.S. to sabotage Nazi plans; *Project X* (1949) revolves around a physicist who helps Federal agents track down a Communist ring looking to steal “atomic energy secrets.” While the alternative stance of *Rendezvous 24* makes it an outlier, both of these conflicting attitudes—scientists are the protectors of American society and scientists as the threat American society needs protecting from—will become prominent in looking at 1950s cinema, and particularly the science fiction boom that dominated that decade.<sup>56</sup>

Of all Hollywood films released in the 1940s, the one that featured the atomic bomb most predominantly was the one dedicated specifically to address that subject: MGM’s *The Beginning or the End* (1947).<sup>57</sup> A “docudrama”—light on the “docu,” heavy on the “drama”—depicting the American development and deployment of the atomic bomb from Fermi’s 1942 chain reaction through the dropping of “Little Boy” on the city of Hiroshima, the film revolves around a fictional young American physicist named Matt Cochran. Matt starts off the film as a research assistant to Enrico Fermi, gets involved in the Manhattan Project, and is ultimately depicted as being single-handedly in charge of making last minute adjustments to “Little Boy” directly prior to its loading on the *Enola Gay*. A tragic figure, Matt ends up irradiating himself to death in the process of putting these final touches on the bomb. While his internal conflict regarding the

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<sup>56</sup> Fritz Lang, “Cloak and Dagger,” (Warner Bros., 1946); James Tinling, “Rendezvous 24,” (20th Century Fox, 1946); Edward Montagne, “Project X,” (Trans Continental, 1949).

<sup>57</sup> Norman Taurog, “The Beginning or the End,” (Metro-Goldwyn-Mayer, 1947).

morality of developing the bomb and his role in the process feature prominently in the film, both Matt and the film more generally ultimately come across as not compellingly conflicted but woefully confused. After fatalistically suggesting that his death represents divine punishment for his involvement in the development of the atomic bomb, strongly echoing the “there are some secrets we are not meant to probe” moral more or less universal to 1930s mad scientist films, Matt also pens a farewell letter to his pregnant wife in which he extols the virtues of the upcoming atomic age, in which the discoveries made in the process of creating the atomic bomb will be utilized in peacetime for the creation of a utopic future.<sup>58</sup>

The decidedly uneven nature of Matt’s attitude towards his work can at least in part be attributed to the sheer number of parties involved in the development of the script, many of whom had strongly conflicting views. Specifically, several Manhattan Project alumni involved in the development of the film from its early stages, hoping to use it as a vehicle to educate the public “about the true nature of atomic weapons,” took strong issue with the celebratory, propagandistic approach desired by MGM, and insisted upon the inclusion of his “moral soul-searching,” while military advisors such as naval officer William S. Parsons took greatest issue with these very same elements of the screenplay. In making select modifications to try and at least somewhat appease all parties, MGM ended up with a character who comes across not so much morally conflicted as suffering from split personality disorder.<sup>59</sup> *The Beginning or the End* represents the uneasy collision between the two most prominent scientist-centric films of the 1930s, the mad scientist morality tale and the lionizing scientist biopic, the collision of original fiction (Matt) and fact-based dramatization (the film also features actors playing Robert Oppenheimer, Albert Einstein, and Enrico Fermi), images of science and scientists sourced from

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<sup>58</sup> Lambert Hillyer, "The Invisible Ray," (Universal Pictures, 1936).

<sup>59</sup> Evans, *Celluloid Mushroom Clouds: Hollywood and the Atomic Bomb*, 28-29.

both fact and fiction. The fact that the film's title is phrased as a question is to be incredibly fitting, considering how deeply confused it proves to be.<sup>60</sup>

Throughout the decade, scientist characters popped up now and again in films belonging to a wide range of genres, but just as was the case in the context of horror films, these were, with few exceptions, minor films produced and released with minimal fanfare. The overall presence of scientists on screen in the 1940s was markedly lower than it was in the 1930s and than it would be again in the 1950s.

### **The 1950s: Heroes and Villains and Dr. Frankenstein Returns**

As Jon Turney notes, “[i]n the aftermath of World War II science took on a heightened significance, both for the public and for the state.”<sup>61</sup> However, films can take years to develop, a latency period which should be taken into account when discussing the interplay between film and scientific developments, disasters, and other such real-world happenings. Because while the period during and the first years directly after World War II showed no particular proliferation of movie scientists, the rise of science-fiction as a major film genre at the start of the 1950s was a clear product of the atomic age.<sup>62</sup>

With the deployment of poison gases, World War I could easily be called the “chemist’s war,” and perhaps that might have factored into the strong bias towards chemist figures in the mad scientist horror films of the 1930s.<sup>63</sup> However, the link between the “physicists’ war” of World War II and the prevalence of physicist figures in the 1950s science fiction film boom is undeniable—and worth significant consideration, because as Joyce Evans writes, “the same

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<sup>60</sup> Taurog, "The Beginning or the End."

<sup>61</sup> Jon Turney, *Frankenstein's Footsteps: Science, Genetics, and Popular Culture* (New Haven: Yale University Press, 1998), 121.

<sup>62</sup> Evans, *Celluloid Mushroom Clouds: Hollywood and the Atomic Bomb*.

<sup>63</sup> Turney, *Frankenstein's Footsteps: Science, Genetics, and Popular Culture*, 92.

restricted set of representations that evolved during this fifteen-year period [1949-1964] still clinging tenaciously to nuclear discourse today and can be found throughout American popular culture as well as in contemporary public debate.”<sup>64</sup>

The relationship between real-world science and the 1950s science fiction boom is complex and, in several regards, contradictory. On one hand, the 1950s represented an unmatched period of celebrity science and scientists, such as Albert Einstein and Werner von Braun.<sup>65</sup> On the other, the Soviet Union’s demonstration of their own nuclear weaponry in 1949 transformed the atomic bomb from a unique beacon of the US’s technological superiority to a major source of anxiety.<sup>66</sup> As addressed earlier, several films in the late 1940s had already incorporated atomic themes before the 1950s wave of science-fiction film came along, but while atomic themes made occasional appearances in other genres, they were pervasive in science-fiction.

Atomic science and nuclear technology remained prominent in public discourse throughout the decade. In 1950, within a year of the Soviet Union detonating its own atomic bomb, President Truman instructed the AEC to produce a hydrogen bomb. The following year, A-bomb testings began in Nevada. In 1952 came the H-bomb test in the Marshall Islands, while British scientists detonated their own atomic weapon in Australia. The next year the Soviets exploded their own H-bomb. American developments in atomic weaponry continued steadily over the 1950s until 1959, when nuclear accidents and reports of significant increases in atmospheric radioactivity over the continental United States inspired a moratorium on nuclear testing that ultimately lasted three years, coming to an end in 1962.<sup>67</sup>

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<sup>64</sup> Ibid 121; Evans, *Celluloid Mushroom Clouds: Hollywood and the Atomic Bomb*, 2.

<sup>65</sup> Krauss, "Scientists as Celebrities: Bad for Science or Good for Society?."

<sup>66</sup> Evans, *Celluloid Mushroom Clouds: Hollywood and the Atomic Bomb*, 51.

<sup>67</sup> Ibid 18-19.



Hollywood films made in the 1950s were boxed into a strict code of conduct, required to adhere to both the Production Code and mind the sensitivities of the looming anti-communist watchdog, the House Committee on Un-American Activities (HUAC), which “dictated who worked and who didn’t, which subjects were appropriate and which weren’t, how plots could be resolved and how they couldn’t.”<sup>68</sup> Furthermore, government anti-trust action forced the separation of production and exhibition within the film industry, bringing about an end to the vertical integration that had allowed the five major studios—20<sup>th</sup> Century Fox, RKO Pictures, Paramount Pictures, Warner Bros., and Metro-Goldwyn-Mayer—to dominate the industry for decades. In keeping with this mandate, all the movie theaters owned by producer-distributors were sold to independent corporations between 1949 and 1953, just as television became a major competitor for audiences’ attention.<sup>69</sup> As such, the rise of spectacle-based science fiction, with its out-of-this-world adventures, futuristic robots, and giant monsters, should also be understood in the context of the film industry’s race to compete with the convenience of staying home and watching television.

The first two major science-fiction successes of the decade came in 1950 with *Rocketship XM* and *Destination Moon*. The first tells the story of an Mars expedition that discovers the planet to be a “radioactive desert” occupied by “crazed” nuclear survivors, “the first widely distributed film to expound the fact that humanity now had the power to wipe out civilization entirely, and the first to show the possible effects of atomic devastation, albeit at a safe distance and on another civilization.”<sup>70</sup> Meanwhile, *Destination Moon* presents “a thoroughly realistic

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<sup>68</sup> Barry Langford, *Post-Classical Hollywood: Film Industry, Style, and Ideology since 1945* (Edinburgh: Edinburgh University Press, 2010); Biskind, *Seeing Is Believing: How Hollywood Taught Us to Stop Worrying and Love the Fifties*, 4.

<sup>69</sup> Evans, *Celluloid Mushroom Clouds: Hollywood and the Atomic Bomb*, 6.

<sup>70</sup> Ibid 65.

film about space travel” that sought to attract a more general audience “rather than the children and nice fan audiences” associated with pulp science fiction magazines and space fantasies such as the *Flash Gordon* serials.<sup>71</sup>

From there, the floodgates opened. While the trendsetting films of 1950 saw humans leaving Earth and finding adventure, 1951 saw the adventure coming to us. The two most successful sci-fi titles of the year established both subcategories of extraterrestrial arrival films: *The Thing from Another World* brought the first malevolent alien invasion in the big screen while *The Day the Earth Stood Still* introduced a benevolent emissary from outer space. Either way, the U.S. military kills the alien, but in the case of the former that equates to vanquishing the beast while in the latter it’s more along the lines of murdering the second coming of Christ.<sup>72</sup>

While a detailed analysis of *The Thing* will be presented in chapter 4, it is worth stopping to compare these two 1951 releases as they present in one sense highly similar, but in another entirely opposite, depictions of scientists which ultimately represent two opposing views on science and scientists, and both camps will continue to make a strong showing throughout the decade.

The main scientist character in *The Thing*, Dr. Carrington, is an antagonist. He is introduced as an accoladed nuclear scientist spearheading an Antarctic research expedition that ends up finding a crashed flying saucer embedded in ice, instigating the involvement of the U.S. military, represented by US Air Force Captain Patrick Hendry, the film’s hero. The two clash over what to do with the alien found alongside the spacecraft—Hendry wants to destroy it; Carrington wants to study it, quickly becoming enamored with what he determines represents a

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<sup>71</sup> Bradley Schauer, “‘The Greatest Exploitation Special Ever’: Destination Moon and Postwar Independent Distribution,” *Film History* 27, no. 1 (2015), 2.

<sup>72</sup> In *The Day the Earth Stood Still*, Klaatu is an alien who comes in peace, goes by the alias Mr. Carpenter (subtle), and gets killed for trying to share a message with humanity before ultimately being resurrected.

“superior” life form (due to its asexual reproduction). Even after the “Thing” defrosts and proves to be both alive and dangerous, Carrington wants to communicate with it, entirely convinced that the being is both rational and benign. He insists that the alien’s violent behavior upon waking can easily be understood as an instinctive, fearful reaction upon waking up in an unfamiliar and frightening environment. Up until the final showdown between man and Thing, Carrington maintains this stance, approaching the Thing unarmed and speaking of friendship and peace. To fully confirm the film’s attitude towards Carrington’s beliefs as foolish and entirely unfounded, the Thing gives a definitive response to the scientist’s offer by tossing him across the room, knocking him unconscious.<sup>73</sup>

In *The Day the Earth Stood Still*, a flying saucer also lands on Earth, only this time in Washington, D.C. instead of the Antarctic.<sup>74</sup> And once again, the military immediately seeks to neutralize the alien threat while the scientists, here represented by the “Einstein-like” Professor Barnhardt, want to communicate.<sup>75</sup> But now it is Barnhardt who is depicted as in the right, while the aggressively fearful military are vilified. Both films ultimately hold similar notions of who a scientist is and what sort of mindset such an individual possesses, yet they just as staunchly diverge as to whether such an individual should inspire admiration or scorn. As Vivian Sobchack writes, throughout the 1950s, Hollywood science fiction “display[ed] dual and opposing attitudes towards science, logic, and order.”<sup>76</sup>

The year 1950 codified the space voyage film, 1951 brought two flavors of extraterrestrial arrival to the big screen, and 1953 established two more significant sci-fi film

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<sup>73</sup> Christian Nyby, "The Thing from Another World," (RKO Radio Pictures, 1951).

<sup>74</sup> Robert Wise, "The Day the Earth Stood Still," (20th Century Fox, 1951).

<sup>75</sup> Bill Warren, *Keep Watching the Skies! American Science Fiction Movies of the Fifties* (Jefferson: McFarland & Company, 2016), 211.

<sup>76</sup> Sobchack, *Screening Space: The American Science Fiction Film*, 24.

subgenres in the form of the atomic creature feature—ultimately the most economically successful group of the 1950s sci-fi films—introduced with *The Beast from 20,000 Fathoms*, and the alien brainwashing film introduced with *Invaders from Mars*.<sup>77</sup> Scholarship has come up with various phrases to describe the collection of 1950s films featuring beasts created or otherwise unleashed by various forms of nuclear radiation, including Bug-Eyed Monsters (BEM), radiation-produced monsters, and more, but for the sake of concision and clarity I shall refer to them as “creature features.”<sup>78</sup>

Unlike the monsters unleashed by mad scientists of yore, the creature feature was distinct in that these scourges are overwhelmingly not intentional creations, but accidental byproducts of scientific activity, most frequently of the nuclear variety.<sup>79</sup> In *The Beast from 20,000 Fathoms*, the beast is a prehistoric menace unleashed from an icy tomb by a nuclear test; the box-office sensation *Them!* (1954) upgrades the minor annoyance of ant infestation to cataclysmic proportions via radiation-induced gigantism and inspiring a wave of other creature features dedicated specifically to really big bugs, including *Tarantula* (1955) and *Beginning of the End* (1957; the big bugs are grasshoppers this time around).<sup>80</sup>

Although creature features involve monsters unleashed by scientific activity, these films, on the whole, are not nearly as anti-science as their basic premise might suggest. While the subgenre did emerge “in direct relation with increasing public concern over the ability to contain the consequences of atmospheric testing,” science and scientists are consistently depicted as

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<sup>77</sup> Evans, *Celluloid Mushroom Clouds: Hollywood and the Atomic Bomb*; Mark Jancovich, *Rational Fears: American Horror in the 1950s* (New York: Manchester University Press, 1996), 66, 52.

<sup>78</sup> Sobchack, *Screening Space: The American Science Fiction Film*, 43.

<sup>79</sup> Evans, *Celluloid Mushroom Clouds: Hollywood and the Atomic Bomb*, 8; Tudor, “Seeing the Worst Side of Science,” 589; Sobchack, *Screening Space: The American Science Fiction Film*, 44-46.

<sup>80</sup> Jancovich, *Rational Fears: American Horror in the 1950s*, 52-53 Gordon Douglas, “Them!,” (Warner Bros., 1954); Eugène Lourié, “The Beast from 20,000 Fathoms,” (Warner Bros., 1953).

being just as key in defeating the giant monsters as they are in unleashing them.<sup>81</sup> In *The Beast from 20,000 Fathoms*, the prehistoric sea monster is ultimately brought down by not just any scientist, but specifically an atomic scientist, who delivers the killing blow to the monster via radioactive isotope injection. Such a narrative was the standard for creature features, though other films depicted scientists from a wide range of other, non-nuclear specialties—for example father-daughter myrmecologist team Dr. Harold and Dr. Pat Medford in *Them!*—as key in defeating the radiation-made creatures of the hour.<sup>82</sup>

Scientist characters were everywhere in 1950s science fiction films, as heroes, villains, and everything in between—even love interests. Women scientists were widespread within the genre, and became something of a default female lead for the genre much the way the mad scientist's daughter (or neglected wife) was in 1930s horror.<sup>83</sup> However, as these characters are almost always love interests, women scientists in 1950s science fiction film are overwhelmingly depicted as young, and therefore junior, scientists. They are also exclusively white.

Furthermore, the implications of “scientist” varies widely between films; some female scientists in 1950s are very much scientists in name only, with roles that ultimately boil down to various combinations of running, screaming, fainting, and being captured (and subsequently rescued). However, this trend was not universal or even an overwhelming majority—many of the women scientist characters of 1950s science fiction are ultimately depicted as competent scientists in their own right, with professional ambition and training that proves just, or sometimes even more, narratively significant than their role as designated love interest. In fact,

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<sup>81</sup> Evans, *Celluloid Mushroom Clouds: Hollywood and the Atomic Bomb*, 66.

<sup>82</sup> Douglas, "Them!"; Lourié, "The Beast from 20,000 Fathoms."

<sup>83</sup> Examples of 1950s films prominently featuring women scientists include: *The Beast from 20,000 Fathoms* (1953), *Invaders from Mars* (1953), *Them!* (1954), *Creature from the Black Lagoon* (1954), and *Tarantula* (1955), among a number of others.

cinematic depictions of female scientists were more widespread, and their professional ambition more frequently framed more admirably, in 1950s films than they would be until the 1990s.<sup>84</sup>

In looking at 1950s films in the context of Cold War ideology, many of these narratives of alien invasion, brainwashing, and giant monster attack have been interpreted as coding fears of Soviet aggression and the dangers presented by nuclear weapons and technology. As such, much focus has been given on the depiction of authority figures in these films, and how they are characterized. Several scholars have identified the typical authority figures (or, representatives of “the state”) in these films as “military-scientific types” or groups featuring military and scientist collaborators.<sup>85</sup> However, while military-scientific relationships are widespread across the genre, the nature of these relationships varies widely between films.

Catastrophe-initiated relationships between scientific and military parties are another relevant hallmark of 1950s science-fiction, although depending on the film in question the nature of that relationship ranges from a pleasant and mutually beneficial partnership (e.g. *Them!*) to a power struggle between heroes and villains in which the hero will ultimately triumph, although which party plays which role is variable, as exemplified in the contrast between *The Thing from Another World* and *The Day the Earth Stood Still*. Even when military-scientist collaborations are amicable, the power dynamics within these collaborations vary widely between films.

Looking at how these dynamics differ between films does not appear to elucidate any particular overarching trend, but this variability does indicate a sense of distinction with at least some degree of nuance between “military” and “scientific” aims and goals, with different films taking different stances on the relative values of each. However, after the 1950s, military-scientist

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<sup>84</sup> See: *Top Gun* (1986)

<sup>85</sup> Brian Murphy, "Monster Movies: They Came from beneath the Fifties," *The Journal of Popular Film* 1 (1972), 32; Jancovich, *Rational Fears: American Horror in the 1950s*, 15-16.

collaborations will continue to recur in films, but becoming ever-increasingly conflated, until the standard cinematic “military-scientific type” becomes a singular character, who is almost always a villain.

However, the standard depiction of the science fiction movie scientist shifted significantly over the course of the 1950s. Whereas science tended to be seen as just as crucial to saving the world as endangering it in the first place in the early 1950s, by the middle of the decade, a shift occurred. While scientists and the products of their work were still overwhelmingly—and still usually accidentally—involved in the creation of monsters or other destructive forces, they became increasingly powerless to halt or undo the damage they caused. In *Tarantula* (1955), the scientist Gerald Deemer develops a growth serum (spoiler alert: it’s radioactive) with the intent of using it in an agricultural context to bring about an end to world hunger. Only it ends up working a little too well, resulting in a giant tarantula running loose and wreaking havoc. Human exposure to the serum also proves to have severe side effects, leaving the scientist horribly disfigured. As Gerhard Wiesenfeldt notes, “[Deemer] tries to regain control, until in his last scene, he realizes the horrific consequences of his actions and dies, a tragic hero of science.”<sup>86</sup> Deemer’s noble intentions lead only to destruction, and he is ultimately powerless to save others or even himself from the horrors he accidentally unleashed.<sup>87</sup>

Outside of Hollywood sci-fi, the most significant movie scientist of the 1950s was a British import: *The Curse of Frankenstein* (1957), a smashing success that made Hammer Films a major international name in horror.<sup>88</sup> Universal, who retained the rights to both the 1931 film

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<sup>86</sup> Gerhard Wiesenfeldt, "Dystopian Genesis: The Scientist's Role in Society, According to Jack Arnold," *Film & History* 40, no. 1 (2010). It's also worth noting that Deemer's research is quite likely modeled after the work of actual scientists the film's director Jack Arnold encountered while filming the documentary *Chicken of Tomorrow* (1948), which follows American agricultural efforts to increase the size and growth rates of chickens via the use of chemical nutrients.

<sup>87</sup> Jack Arnold, "Tarantula!," (Universal-International, 1955).

<sup>88</sup> Terence Fisher, "The Curse of Frankenstein," (Warner Bros., 1957).

version and Peggy Webling's successful stage version, warned Hammer upon hearing their plans to make a Frankenstein film that copyright would be "zealously enforced" by the Universal legal department if need be, putting particular emphasis on their ownership of the makeup design of Frankenstein's monster as made famous in Boris Karloff's rendition. As Kevin Heffernan writes, screenwriter Jimmy Sangster, director Terence Fisher, and star Peter Cushing ultimately crafted something a world apart from Universal's films, and even Shelley's original novel, "by focusing not on the suspicious young bride (as in the gothic novel) or on the pitiful monster (as in the Universal films) but on the ruthless, sadistic, and odiously suave Baron Victor Frankenstein himself."<sup>89</sup> And as Andrew Turney notes, in the Hammer series the scientist "was a more compelling character than his creation: driven, ruthless, brilliant."<sup>90</sup>

In his seminal history of Hammer Films, *A History of Horrors*, Denis Meikle refers to Cushing's Frankenstein as "a veritable serpent in a silk dressing gown," bringing the biblical iconography of forbidden knowledge to the fore.<sup>91</sup> If Colin Clive's 1931 Frankenstein is a sinner, Cushing's Frankenstein is a demon, cold and remorseless and bearing more than one explicit parallel to Josef Mengele.<sup>92</sup> Much like Universal's *Frankenstein*, *The Curse of Frankenstein* also features a wizened older scientist as the film's voice of reason in Professor Bernstein. But unlike Waldman, who is ultimately killed by Frankenstein's monster, Bernstein is killed by the scientist himself, with the express intention of using his brain for his creature. In *Frankenstein*, the virtuous scientist comes up against the product of mad science and loses; in *The Curse of Frankenstein*, the virtuous scientist becomes the product of mad science.

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<sup>89</sup> Kevin Heffernan, *Ghoul, Gimmicks, and Gold: Horror Films and the American Movie Business, 1953-1968* (Durham: Duke University Press, 2004), 48.

<sup>90</sup> Turney, *Frankenstein's Footsteps: Science, Genetics, and Popular Culture*, 150.

<sup>91</sup> Denis Meikle, *A History of Horrors: The Rise and Fall of the House of Hammer* (Lanham: Scarecrow Press, 1996), 43.

<sup>92</sup> Heffernan, *Ghoul, Gimmicks, and Gold: Horror Films and the American Movie Business, 1953-1968*, 50.



While Cushing's *Frankenstein* is the star, the film had another "major attraction" for 1950s audiences—"unprecedented levels of onscreen gore," and in full color to boot.<sup>93</sup> As soon as *The Curse of Frankenstein* became one of the highest-grossing films of the year at the U.S. box office, the influence of the Hammer aesthetic quickly became apparent in films like *The Fly* (1958) and *The Tingler* (1959), both of which also star scientist characters.

Whether heroes or villains, the 1950s remain a high-water mark for the on-screen presence of scientists. While overwhelmingly white, the films of this decade also feature more female scientists in prominent roles than would be seen again until the 1990s. Notably, however, as the decade went on, science fiction films increasingly depicted scientists as unable to compensate for the damage caused, directly or indirectly, by their work, a trend that will continue to be seen in future decades.

### **The 1960s: A Space Odyssey for the Space Age**

The 1960s were, overall, an optimistic decade for science, from *TIME* magazine naming American scientists "Men of the Year" in 1960 to the successful *Apollo 11* lunar mission in 1969.<sup>94</sup> Due to the Apollo program, the 1960s are often remembered as the "space age," but it was also the "decade of the Biological Revolution."<sup>95</sup> "DNA" was the name of the game, as Watson, Crick, and Wilkins took home the prize in physiology or medicine for discovering the DNA structure in 1962 and journalists and popular writers brought biology to the forefront as the field of molecular biology became established.<sup>96</sup> Scientists were optimistic about the future of this new field, with several prominent scientists predicting the manipulation and creation of

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<sup>93</sup> Ibid 48.

<sup>94</sup> Michael Egan, "Survival Science: Crisis Disciplines and the Shock of the Environment in the 1970s," *Centaurus* 59 (2017), 29.

<sup>95</sup> Turney, *Frankenstein's Footsteps: Science, Genetics, and Popular Culture*, 143.

<sup>96</sup> Ibid 145-6.

artificial life in the near future, with the term “genetic engineering” starting to creep into wide use late in the decade, though the actual debates over the subject would not start to heat up in earnest until the 1970s.<sup>97</sup>

In 1967, Christiaan Barnard performed the first human heart transplant deemed successful in December; 1968 was dubbed “the year of the transplant” in the press and saw 105 heart transplants performed.<sup>98</sup> The first implantation of an artificial heart in a human in 1969 would be met with far more controversy, however, and see the surgeon involved censured by his medical colleagues. Commentators in the popular press were quick to compare the “Biological Revolution” to the atomic one, both in terms of significance and potential destructive power. Specifically, many of innovations the “Biological Revolution” that would continue to develop in later decades fall under the umbrella of biotechnology—“the use of recombinant DNA techniques, cell fusion, and bioprocessing techniques to modify life forms for various research and commercial uses.”<sup>99</sup>

In an 1969 *Atlantic* article, Donald Fleming discusses the seismic shifts shaking up the study of biology and writes, “the younger molecular biologists hardly bother to conceal their contempt for the naturalists, whom they see as old fogies obsequiously attentive to the world as it is rather than bent on turning it upside down.”<sup>100</sup> Ironically enough, the movies would end up taking the exact opposite attitude when it came to the life sciences, treating naturalists favorably while hardly bothering to conceal their contempt for molecular biologists—but more on that later.

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<sup>97</sup> Ibid, 148-9.

<sup>98</sup> Ibid, 154.

<sup>99</sup> L. Christopher Plein, "Popularizing Biotechnology: The Influence of Issue Definition," *Science, Technology, & Human Values* 16, no. 4 (1991), 474.

<sup>100</sup> Donald Fleming, "On Living in a Biological Revolution," *The Atlantic Monthly*, February 1969.

The spirit of revolution that dominated 1960s culture and American society, from biology to the increasing polarization surrounding the Vietnam war to the civil rights struggle, also made it to the film industry, for which the decade was one of “profound change and challenge [as] it sought to adapt to both technological innovation and evolving cultural taste.”<sup>101</sup>

As the studio era came to an end, so did its system of on-screen stars and codified genres.

American film audiences shrank and fragmented. Established talents both behind the camera and in front of it floundered, and no one seemed to be able to predict what the next blockbuster hit would be.<sup>102</sup>

In his extensive study of horror films from 1931 and 1984, Andrew Tudor notes that while over a quarter of them posited science as a harbinger of evil overall, there was “a broad decline in the proportion of science-based horror movies after 1960s.”<sup>103</sup> There was, however a notable *increase* in scientist-starring comedies in the decade, with the most iconic among them being *Dr. Strangelove or: How I Learned to Stop Worrying and Love the Bomb* (1964).<sup>104</sup>

*Dr. Strangelove* had several predecessors in the handful of “atomic comedy” films released in the 1950s that sought to make light of nuclear issues while depicting military personnel and scientists as “incompetent buffoons,” such as *Living it Up* and *Atomic Kid* (both 1954), an absurdist slapstick comedy in which a “uranium prospector” accidentally finds himself in a “doom town”—a mannequin-filled replica of suburbia used to macabre effect in televised nuclear test detonations—on the day of a bomb drop. None of these atomic comedies fared well at the box office, and by the mid-50s studios stopped trying—until 1964, of course, when the

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<sup>101</sup> Barry Keith Grant, "Introduction," in *American Cinema of the 1960s*, ed. Barry Keith Grant (New Brunswick: Rutgers University Press, 2008).

<sup>102</sup> Peter Lev, *American Films of the 70s: Conflicting Visions* (Austin: University of Texas Press, 2000).

<sup>103</sup> Tudor, "Seeing the Worst Side of Science," 589.

<sup>104</sup> Stanley Kubrick, "Dr. Strangelove Or: How I Learned to Stop Worrying and Love the Bomb," (Columbia Pictures, 1964).

“satirical doomsday humor” of *Dr. Strangelove* found a warm welcome in terms of ticket sales.<sup>105</sup>

The 1960s feature several major mad scientist-starring comedies besides *Dr. Strangelove*, but in addition to being the most iconic of the group, Stanley Kubrick’s film is also something of an outlier. While the other mad scientists blow up their classrooms and laboratories, *Dr. Strangelove* blows up the world. Mad scientist comedies often acknowledge their protagonists as dangerous, but usually not on an apocalyptic scale. However, that said, *Dr. Strangelove* has far more in common with the other mad scientist comedies in its reliance on visual and narrative tropes well-established in mad-scientist fare. Wheelchair bound, with eyeglasses and a black-gloved prosthetic arm with a mind of its own, *Dr. Strangelove* gives Cold War nuclear fears a 1920s-30s look. The singular black glove rips a page directly from Rotwang’s book, while the uncontrollable, violent nature of said limb echoes *Doctor X* (1932), in which amputee Dr. Wells moonlights as a murderer with help from a “synthetic flesh” hand.<sup>106</sup>

While *Dr. Strangelove* depicts a mad scientist bringing about nuclear Armageddon—albeit, in a humorous way—other popular film comedies of the early 1960s, including *The Absent-Minded Professor* (1961) and *The Nutty Professor* (1963) depict scientists as endearing in their zany antics, still a definite brand of madness, but a lovable one that would continue to feature in hugely popular films in subsequent decades, including *Young Frankenstein* (1974), *Back to the Future* (1985) and sequels, *Honey, I Shrunk the Kids* (1986), and the 1996 remake of *The Nutty Professor*. Notably, with the exception of *Young Frankenstein*, all of these films staunchly maintain the trend of “funny” scientist characters noted in the 1930s in films such as *Lost Horizon* and *Bringing Up Baby*—that is, the scientists are not entertaining because they are

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<sup>105</sup> Evans, *Celluloid Mushroom Clouds: Hollywood and the Atomic Bomb*, 64, 65.

<sup>106</sup> Fritz Lang, "Metropolis," (Kino Video, 1927); Michael Curtiz, "Doctor X," (Warner Bros., 1932).

trying to be funny, but because they have abysmal social skills and fail at socializing in a manner that is amusing to watch.

While *Dr. Strangelove* might be the first “Dr.” film to come to mind when one thinks of the 1960s, another similarly titled film with an enormous cultural legacy premiered in this decade: *Dr. No* (1962), the first film in the James Bond film franchise that currently has 24 installments to date, with a 25<sup>th</sup> currently slated for release in 2020.<sup>107</sup> In addition to launching a franchise, *Dr. No* helped spark a flurry of secret agent films in the 1960s and made the supervillain scientist a standard of the genre, well-engrained to the point of being parodied in the *Austin Powers* film series in the late 1990s and early 2000s.

In *Dr. No*, much is made of the biracial identity of its titular scientist villain. In defying clear and comfortable categorization he is fundamentally “Other”— a hybrid outside the natural order of things. Four years later, the original *Star Trek* series would premiere on NBC and feature the half-human half-alien (Vulcan) science officer Spock, whose similar hybridity would repeatedly become of key narrative significance in this and later appearances of his character, in both a series of films beginning in 1979 and a reboot film series beginning in 2009.<sup>108</sup>

As usual, the genre featuring the most concentrated population of scientists in the 1960s is science fiction, and for this decade in science fiction one title looms large above all others: *2001: A Space Odyssey* (1968), “the most scientifically accurate film ever made for its time.”<sup>109</sup> Filmmaker Stanley Kubrick hired former NASA space scientist Frederick Ordway to be the film’s primary science consultant and brought on aerospace engineer Harry Lange as production designer. Lange had also previously worked at NASA, illustrating “as-yet-unborn vehicle

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<sup>107</sup> Terence Young, “Dr. No,” (United Artists, 1962).

<sup>108</sup> Bonnie Brain, “Saviors and Scientists: Extraterrestrials in Recent Science Fiction Films,” *ETC: A Review of General Semantics* 40, no. 2 (1983).

<sup>109</sup> Kirby, *Lab Coats in Hollywood: Science, Scientists, and Cinema*.

concepts” so that the organization could use these visualizations to “communicate their ideas for the future.”<sup>110</sup> Ordway and Lange used their insider knowledge of trends in the space industry and space science to predict how space technologies would most likely develop. “Corporate giants” including NASA, IBM, Boeing, Bell Telephone, Chrysler, and General Electric all provided “tons of documentation and even real hardware,” rooting *2001* in both the scientific and technological realities of the present as well as the future predictions of scientific experts.<sup>111</sup>

The concept of prioritizing and centering scientific and technological authenticity in what was known, and even aiming for plausibility in what remained theoretical, was not merely central in how Kubrick developed the film, but in how the film was marketed, putting it firmly in the same “science-minded” lineage as *Destination Moon*. The original press release for *2001* makes a point of noting the film will be “scientifically based,” and then proceeds in the following sentence to quote “the great biologist” J. B. S. Haldane, the only quotation featured in the release—and an ironic choice, considering Haldane demonstrated no particular interest in the space travel.<sup>112</sup> Furthermore, in a 1966 *New Yorker* profile on Kubrick and Clarke in their development of the film—at that point, still going by the working title *Journey Beyond the Stars*—the author, theoretical physicist Jeremy Bernstein, notes the filmmaker’s instance that “everything possible would be done to make each scene completely authentic and to make it conform to what is known to physicists and astronomers,” going on to state that Kubrick and Clarke “feel that while there will be dangers in space, there will also be wonder, adventure, and beauty.”<sup>113</sup>

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<sup>110</sup> Piers Bizony, “Shipbuilding,” in *The Making of 2001: A Space Odyssey*, ed. Stephanie Schwam (New York: Modern Library, 200), 44.

<sup>111</sup> *Ibid.*, 46.

<sup>112</sup> MGM, “Stanley Kubrick to Film “Journey Beyond the Stars” for Mgm,” news release, 1965.

<sup>113</sup> Jeremy Bernstein, “Beyond the Stars,” in *The Making of 2001: A Space Odyssey*, ed. Stephanie Schwam (New York: Modern Library, 1966), 29.

Not only does this general stance become emblematic of other “science-minded” space voyage science-fiction films, but the enormously effective audiovisual techniques Kubrick’s film utilizes to invoke wonder will go on to be co-opted by many of the historical films about NASA, including *The Right Stuff* (1983), *Apollo 13* (1995), and *First Man* (2018). As such, in the wake of *2001*, both the fantasy of future space travel and NASA historical dramas marketed for authenticity are intertextual to the same referents and therefore share the same generic language.

Another distinctive quality of *2001* has to do with its characterization—namely, the lack thereof. The scientist characters who populate the film are cold, not in the fascinatingly brutal way of Cushing’s Dr. Frankenstein, but simply flat and dull. Theoretical physicist Freeman Dyson, who visited the set and then watched the movie upon release, noted, “When I saw Kubrick at work on *Space Odyssey* in London, I was immediately struck by the fact he was interested in gadgetry rather than in the people. Watching the finished movie, I found the lack of human characterization even more remarkable. [...] As a scientist, [...] I wished we had had a chance to see Keir Dullea act.”<sup>114</sup>

### **The 1970s: Disasters, Present and Future**

With regards to everything from the economy to popular culture, the 1970s are widely regarded as “a time of deep economic, social and cultural transformation” marked by a shift “from progress and optimism to cultural pessimism.”<sup>115</sup> The booming economy of the 1960s slipped into recession at the same time the continuing Vietnam War and the OPEC oil price shock spiked inflation. As Peter Lev writes, “the early 1970s was a period of soul-searching in the United States, a period which demonstrated the limits of American power and security in the

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<sup>114</sup> “Testimonies: Freeman Dyson,” *ibid.*, ed. Stephanie Schwam (2000).

<sup>115</sup> Matthias Heymann, “1970s: Turn of an Era in the History of Science,” *Centaurus* 59 (2017), 1, 2.

world.”<sup>116</sup> In the film industry, the uncertainty that began in the mid-1960s with the end of the studio era and the ever-increasing competition from television continued, though the tides began to change in the latter half of the decade with the return to “simple, optimistic genre films” kickstarted by the unprecedented success of *Jaws* (1975) and *Star Wars* (1977).<sup>117</sup> It was against this backdrop that the “disaster movie” became a prime Hollywood genre.

Ensemble affairs that pull from any number of genres including adventure, science fiction, horror, and even comedy, disaster films are typically set-piece heavy ensemble fare featuring a group of people struggling to survive against the odds in the face of some cataclysmic event. While scattered disaster films were made in Hollywood well before the 1970s, with some of the better-known examples including *The Hurricane* (1937), *A Night to Remember* (1958), and *On The Beach* (1959; a rare example in which none of the protagonists actually succeed in surviving against the odds), it was in this decade that the genre went through a “golden age” with the success of such films as *Airport* (1970), *Earthquake* (1974), and *The Towering Inferno* (1974). The commercial success of this disaster film wave would go on to be closely replicated in the late 1990s and early 2000s with a surge of disaster films largely inspired by advancements in special effects, and computer imaging in particular; this resurgence will be addressed at much greater length later in this chapter.<sup>118</sup>

In science-related news, with the space race won, the *Apollo* program, and space science more generally, lost considerable urgency in the public eye. However, the technical difficulties experienced by the 1970 *Apollo 13* mission turned what was originally shaping up to be a widely overlooked lunar voyage—comfortably routine in the shadow of the previous moon missions—

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<sup>116</sup> Lev, *American Films of the 70s: Conflicting Visions*, 40.

<sup>117</sup> *Ibid.*, xvii.

<sup>118</sup> Kim Newman, *Nightmare Movies: Horror on Screen since the 1960s* (New York: Bloomsbury, 2011), 102-105.



into a nail-biting news story, with the astronauts' safe return home in the face of major technological failures sculpting what was ultimately still a failed mission into a triumphant story of American bravery and ingenuity in the face of danger, a heroic framing which would be emphatically stamped into the popular imagination 25 years later with Ron Howard's hugely successful and celebratory *Apollo 13* (1995). The early 1970s saw the continuation and ultimate conclusion of the *Apollo* program with *Apollo 14*, *Apollo 15* (both 1971), *Apollo 16*, and *Apollo 17*, the last manned lunar landing (both 1972). The decade also saw significant achievements in unmanned space exploration, including images of the Martian surface courtesy of *Mariner 9* and later the *Voyager* probes; the launch of *Pioneer 10* space probe in 1972, which would over a decade later become the first human-made object to leave the solar system; the discovery of a ring around Jupiter using information gathered by the *Voyager 1* probe; and the discovery of several new moons orbiting Jupiter and a moon orbiting Pluto.<sup>119</sup>

Computer science saw several major developments, with the 1970 introduction of the floppy disk, the 1971 introduction of the first microprocessor (by Intel), the 1977 launch of the Apple II personal computer. In particle physics, 1972 marked the opening of the large particle accelerator at Fermi National Accelerator Laboratory; discoveries of new subatomic particles followed not long after—the J/psi particle in 1974 and the tauon in 1975. Pollution became an increasingly popular concern, with President Nixon signing the National Air Quality Control Act, aiming to reduce automobile pollution by 90% in five years, in December 1970. In 1972, the Environmental Protection Agency (EPA) eliminated most use of DDT due to its decimation of wild bird populations via biomagnification (as well as concerns of toxicity to humans), while

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<sup>119</sup> "The 1970s Science and Technology: Chronology," in *Uxl American Decades*, ed. Julie L. Carnagie, et al., 1970-1979 (Detroit, MI: UXL, 2003).

1978 saw the banning of chlorofluorocarbons (CFCs) as spray propellants, although their impacts on the ozone layer would not fully come into focus until the 1980s.<sup>120</sup>

However, if there was one field that dominated public science discourse in the 1970s, it was genetics. The year 1970 brought about the isolation of the first restriction enzyme, and from there genetic technology progressed by leaps and bounds. Scientists at Stanford University generated the first recombinant DNA molecules in 1972; the first recombinant bacteria were generated the following year, inspiring concerns both within the scientific community and outside it about the potential for the production of new and dangerous pathogens through genetic engineering. In 1974, scientists at the Asilomar conference called for halting genetic engineering research until further consideration had been given to its implications, but 1976 saw the creation of the first company devoted to commercial genetic engineering, Genentech—the same year rising public concern inspired the National Institutes of Health (NIH) to release guidelines restricting recombinant DNA experiments; they would go on to relax these restrictions three years later.<sup>121</sup> The year 1976 also brought a three-month long city-wide moratorium on DNA experiments in Cambridge, Massachusetts, after mayor Alfred Velucci grew concerned over reports of “strange creatures” spotted across New England that he feared might be connected to “recombinant DNA experiments” taking place in local research laboratories, particularly at Harvard University.<sup>122</sup>

In terms of public opinion, commentators looking at the 1970s have widely noted a “retreat from science,” with American scientists going from *TIME*’s “Men of the Year” in 1960

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<sup>120</sup> Ibid.

<sup>121</sup> Ibid.

<sup>122</sup> Peter Nagy et al., “The Enduring Influence of a Dangerous Narrative: How Scientists Can Mitigate the Frankenstein Myth,” *Bioethical Inquiry* 15 (2018), 279.

to being “vilified in the popular press” by 1970.<sup>123</sup> Among the primetime television series of this time, 1973 to 1983, scientist characters were both more likely to be evil (1 in 6) and to be killed (1 in 10) than characters in any other profession.<sup>124</sup> As Michael Ryan and Douglas Kellner write, “[i]n 1970s films, technology was frequently a metaphor for everything that threatened ‘natural’ social arrangements, and conservative values associated with nature were generally mobilized as antidotes to that threat,” and the threat to “natural order” was nowhere greater than when it came to the intersections of life science and technology.<sup>125</sup> Androids and humanoids originating from somewhere in a liminal space between robotics, genetic engineering, and cloning stalked the silver screen in films like *THX 1138* (1971), *Westworld* (1973), and *The Stepford Wives* (1975), with the distinction between “natural” humanity and its lab-generated doppelgangers only growing more thematically significant—and difficult to find—as the trend continued through the end of the decade and into the 1980s with films like *Alien* (1979) and *Blade Runner* (1982). Perhaps the most blatant cautionary tale involving genetic technologies came in the 1978 film adaptation of *The Boys from Brazil*, which sees cloning used by a fictionalized version of Josef Mengele to generate nearly 100 Hitler clones, who are then adopted by couples around the world selected by the Nazi scientist for similarities to Hitler’s own parents, in his hopes that the right combination of both identical genetic nature and comparable nurture will result in a full-blown Hitler 2.0. When it comes to the potential threat computers and AI pose to the nature of humanity, the 1970s firmly established the general rule that robots who do not look human, such

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<sup>123</sup> Egan, "Survival Science: Crisis Disciplines and the Shock of the Environment in the 1970s," 27.

<sup>124</sup> *Television Entertainment and Viewers' Conceptions of Science: A Research Report by the Annenberg School of Communications*, 1985.

<sup>125</sup> Michael Ryan and Douglas Kellner, "Technophobia," in *Alien Zone: Cultural Theory and Contemporary Science Fiction Cinema*, ed. Annette Kuhn (New York: Verso, 1990); Frances Gateward, "1973: Movies and Legacies of War and Corruption," in *American Cinema of the 1970s: Themes and Variations*, ed. Lester D. Friedman (New Brunswick: Rutgers University Press, 2007), 101.

as the droids in *Star Wars* (1977), can be presented as amiable, useful companions, but those that appear human, such as in *Westworld*, are typically dangerous if not downright evil.<sup>126</sup>

In his survey of 1970s American cinema, Peter Lev chooses three science fiction films to discuss the genre's role in the decade, which he generously defines as 1969 to 1982: *Star Wars*, *Alien* (1979), and *Blade Runner* (1982). Indeed, it is difficult to *overstate* the cultural impact of these properties; two of which have spawned massive franchises and all of which have seen new film installments in the past five years.<sup>127</sup> However, in spite of its focus on futuristic technologies, *Star Wars* (1977) features no characters, humanoid or otherwise, who could classify as scientists. The other two do. In *Alien*, science wears the face of Ash, the science officer of the starship *Nostromo*; in *Blade Runner*, science is represented by Eldon Tyrell, CEO and founder of the all-powerful Tyrell Corporation. Ultimately, there are several regards in which the characters are remarkably similar. Both are their respective film's ultimate representative of "the establishment," which in both films is staunchly characterized as oppressive and generally nefarious. While neither film involves the takedown of their respective establishments—"the Company," in the case of *Alien*, the Tyrell Corporation in the case of *Blade Runner*—both scientific representatives are ultimately killed, though in the case of Ash the better descriptor would be "destroyed," as he is revealed in a plot twist to be an android.<sup>128</sup>

Whereas Dr. Tyrell is a clear echo of Dr. Frankenstein, Ash is part Frankenstein part Frankenstein's monster, relieved of the empathetic qualities bestowed by Shelley or Karloff's creatures because he embodies aspects of the creator and not just the helpless creation.<sup>129</sup> While

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<sup>126</sup> This trend continues to this day. Compare the non-humanoid droids of the *Star Wars* sequel trilogy, or the box-like *WALL-E* (2008) and TARS from *Interstellar* (2014) to the treachery of the android David in *Prometheus* (2012) or android femme fatale Ava in *Ex Machina* (2014).

<sup>127</sup> *Blade Runner 2049* (2017) and, in the *Star Wars* universe, most recently *Solo* (2018).

<sup>128</sup> Ridley Scott, "Alien," (20th Century Fox, 1979); "Blade Runner," (Warner Bros., 1982).

<sup>129</sup> Lev, *American Films of the 70s: Conflicting Visions*, 171-174; J. P. Telotte, "Human Artifice and the Science Fiction Film," *Film Quarterly* 36, no. 3 (1983), 48.

the “Biological Revolution” might have gotten its start in the 1960s, Dr. Tyrell codifies a particular symbiosis between villainous corporations and biotechnology (genetic technology especially) that continues to loom large to this day in films ranging from blockbusters like *Jurassic World* (2015) and *Venom* (2018) to more independent fare such as *Splice* (2009).

Whether the scientist follows the Dr. Tyrell path and becomes the corporate overlord through his biotechnological discoveries—the case with Carlton Drake in *Venom*—or is merely a pawn employed by the corporate overlord in the vein of Ash—ultimately the case in *Splice*—this relationship still looms large in movie depictions of biotechnology.

In mainstream films released since World War II, nuclear technologies, computer technologies, and genetic technologies are the three kinds of scientific developments that have received the lion’s share of attention. Whether computer technologies are treated as a force for good, evil, or fundamentally benign varies widely between films, while nuclear technologies and genetic technologies are overwhelmingly depicted negatively. However, although nuclear technologies are primarily depicted as dangerous and destructive, there are noteworthy exceptions to this general rule, including films where nuclear detonations save humanity from extinction, such as *The Core* (2003), in which nuclear explosions are used to restart the rotation of the Earth’s core, or *Sunshine* (2007), in which a nuclear detonation is somewhat similarly used to reignite the dying Sun. No major wide-release film I have encountered features genetic technologies in such a prominent and ultimately heroic way.

While the technophobic attitude noted by Ryan and Kellner is indeed a predominant trend in 1970s science fiction, the decade started off with a notable exception to that rule in Robert Wise’s *The Andromeda Strain* (1971), adapted from Michael Crichton’s 1969 novel of the same name. *The Andromeda Strain* is arguably to the life sciences what *2001: A Space Odyssey* is to

space science in its attention to detail, procedure, and the realities of scientific practice. Although far from the most financially successful science-fiction or disaster film of the decade, the film was a moderate box-office success and generally well-received by critics, such as *Los Angeles Times* entertainment editor Charles Champlin, who noted in his positive review that “the principal hero [...] is not an individual but science and technology”—though he does specify that the film also depicts its hero as “distinctly flawed.”<sup>130</sup>

In the film, the U.S. military recruits an elite team of experts—three research scientists and a surgeon—to identify, assess, and figure out how to contain (and ultimately eliminate) an extraterrestrial pathogen. Brought to earth by a crashed satellite, the pathogen has already ravaged the nearby rural town of Piedmont, New Mexico, leaving only two survivors. As such, the film is not only exemplary of the 1970s disaster film trend, but a throwback to the 1950s “alien invasion” plot, just brought down to a microscopic scale.<sup>131</sup>

The bulk of the film takes place in the top-secret underground research facility known as Wildfire, with nearly a half hour of the film’s runtime dedicated just to the extensive safety and decontamination processes the team undergoes to make it down to the laboratory’s bottom level, where they are finally able to begin their investigation. All the team members actively contribute to the ultimately successful stopping of the alien pathogen and are generally depicted favorably, though team leader Dr. Jeremy Stone, a Nobel laureate who helped design Wildfire, is easily the most contentious member of the group. He keeps secrets from the others, the biggest being that Wildfire, contrary to what the others are been told, was built for the purpose of developing bioweapons; a truth Dr. Stone only admits to late in the film after the others corner him with

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<sup>130</sup> Charles Champlin, "Movie Review: A Micro Villain in 'Strain'," *Los Angeles Times*, 31 March 1971, H1; Robert Wise, "The Andromeda Strain," (Universal Pictures, 1971).

<sup>131</sup> Sobchack, *Screening Space: The American Science Fiction Film*, 27.

their suspicions. Stone is also depicted as arrogant and somewhat callous, with a marked tendency to speak to the team's lone female member, Dr. Ruth Leavitt, in a paternalistic and demeaning manner.

Leavitt herself, notably the only member of the team introduced in the most typical fashion for a scientist—that is, working in her lab—is also ultimately revealed to be keeping a risky secret: she has epilepsy, and ends up having a seizure at a particularly inopportune moment, inciting a panic. While her motivations for keeping her condition secret are treated empathetically, the chaos that occurs as a consequence of her secret-keeping only narrowly avoids ending in catastrophe. Dr. Charles Dutton, the third research scientist on the team, is depicted as an affable man—introduced surrounded by his family, a loyal husband, caring father, and doting grandfather—and the most unremarkable scientist, whose key purpose in the film proves to be as something of a damsel in distress, stuck alone in a lab at the moment of a containment breach and therefore exposed to a mutated form of the alien pathogen, left to wait as to whether or not he is due to face an agonizing death while his colleagues can do little but watch him via surveillance camera (he survives; the mutant strain proves to be nonlethal).

Of all the team members, it is surgeon Mark Hall who ultimately takes the lion's share of the hero role. Due to the “Odd Man Hypothesis”—a fictional postulate that unmarried men are the demographic best suited to making the most logical, dispassionate decisions in crisis situations—Mark is entrusted with the control of Wildfire's nuclear self-destruct safety protocol (the other two male team members are married; Ruth is a woman). As such, he is the one who races against the clock to prevent the research base from self-destruction in a *Mission: Impossible*-like fashion. Furthermore, he is the one who figures out how to save people from dying from the Andromeda strain (it can only survive in a very narrow range of blood pH) and

also rushes to Ruth's aid when she experiences that epileptic seizure that sends everyone else fleeing in the opposite direction, fearing she might be infected with the alien pathogen.

The MD-vs.-PhD difference between Hall and his colleagues is given considerable weight within the film. Just about the closest the team of scientists gets to genuine infighting comes when the four are discussing the two Piedmont survivors, whom are being kept under quarantine at the research base, and Hall takes issue with the other three referring to the survivors as "subjects" instead of his preferred "patients." Also, while Hall is originally selected for being the "single man," it is strongly implied at the end of the film that he is single no longer (or at least, not for long), having won the affection of laboratory technician Karen Anson. As Peter Biskind notes, what "rewards" or "punishments" are bestowed upon a given character says a lot in Hollywood film, and securing the affections of a member of the opposite sex over the course of a film generally implies that the character in question is the protagonist.

However, while *The Andromeda Strain* generally diverges from a wider technophobic trend present in 1970s science-fiction film, in the details it actually echoes major anti-science and anti-scientist stereotypes in significant ways.<sup>132</sup> For example, spotlighting the team surgeon and his MD "patient" approach implies a value judgement that frames the PhD "subjects" approach of his teammates negatively. Within the film he is the moral "true North," and as such when he takes issue with their attitude so inherently does the film. Consequentially, while *The Andromeda Strain* is widely lauded as a scientifically accurate, pro-science, pro-scientist science-fiction film, it subtly maintains many of the criticisms seen in the more openly anti-science and technophobic films to which it is often contrasted.<sup>133</sup>

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<sup>132</sup> Gateward, "1973: Movies and Legacies of War and Corruption," 99.

<sup>133</sup> Wise, "The Andromeda Strain."



In 1975, a scientist character plays a key supporting role in one of the decade's definitive films with Stephen Spielberg's career-making *Jaws*, the first film ever to take in more than \$100 million in theatrical rentals—for a brief moment the highest-grossing film ever made, not adjusting for inflation, until *Star Wars* surpassed it two years later. While *Star Wars* can be defined as science-fiction, subcategory: space opera, it is only *Jaws* that features a scientist—or perhaps more accurately, a scientist-in-training (“the Oceanographic Research Institute in South Africa is co-sponsoring my thesis paper”)—in the character of Matt Hooper, one of the three-man team who head off on a quest to hunt down the giant shark terrorizing Amity Island.<sup>134</sup>

However, of the heroic trio, which also features Amity Island Police Chief Martin Brody, the film's protagonist, and veteran fisherman Quint, it is not marine life expert Hooper who ultimately takes down the beast, but family man Brody. As Lev notes, “[t]he tough, traditional Quint is inadequate; so is the expert Hooper, representing science or technology. Brody, intelligent and resourceful but with no special knowledge or talents, wins the day.”<sup>135</sup> Unlike Quint or Hooper, he has a family to protect, and in keeping with the traditional concept of father as protector and breadwinner, Brody's family values give him the edge that he needs to defeat the beast. It is worth noting, though, that the film lets Hooper survive to see the end credits, unlike Quint, which is something of a break with standards considering the frequency with which movies tend to feature scientist characters who are ultimately killed by a representative from their field of study.

Hooper is positively portrayed overall, though he shows signs of the typical faults of a movie scientist. He is somewhat insensitive and lacks tact. When he shares his “rogue shark” hypothesis with Brody, for instance, he uses the somewhat questionable adjective “wonderful” in

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<sup>134</sup> Steven Spielberg, “Jaws,” (Universal Pictures, 1975).

<sup>135</sup> Lev, *American Films of the 70s: Conflicting Visions*, 48.

describing the likelihood that the gruesome killing of “the Watkins girl” was done by the same shark he has been tracking around the world. He later moves to perform an autopsy on a shark that could have potentially eaten a little boy with no thought whatsoever to the presence of the little boy’s mother; Brody stops him (“not here”).

Ultimately, Hooper is a valuable source of information for not just Brody but the audience, adding a degree of depth and a sense of veracity through his frequent explanations of the biology, evolutionary history, and behavior of sharks. *Jaws* is a very effective horror film because it makes the threat of a shark attack feel real and possible, and Hooper’s shark lessons serve a valuable role towards this end by grounding the fictional Amity Island in something that feels like reality.

Hooper serves not just a crucial expositional function but plays an active narrative role in the shark hunt, which is only possible because he has marked the animal with a “Peterson disc tag.” At this revelation, however, Brody instantly points to Hooper’s failure to kill the shark before the creature made it to Amity Island, referring to the animal as Hooper’s “little lab experiment” and then going on to berate him at length, even suggesting that Hooper is on the shark’s side. While Brody eases his rebukes of Hooper eventually, having the film’s protagonist chastise him in that way does still ultimately posit Hooper, though part of the heroic team that eventually ends the shark’s reign of terror, as being in something of an ethical grey zone regarding his prior failure to kill the shark.

As far as starring roles for scientists, the mid-1970s also brought about two of the most famous mad scientist film satires of all time with *Young Frankenstein* (1974) and *Rocky Horror Picture Show* (1975). Much like *Dr. Strangelove* before them, the two films, which both pull from a wide range of mad scientists but rely most heavily on the legacy of *Frankenstein*, satirize

the visual iconography and narrative tropes that have built up around the archetypal figure for decades.<sup>136</sup> While scientific themes reflecting advancements in genetic technology and computers loom large and foreboding in science fiction and horror in this decade, actual scientist *characters* are usually supporting players in these films. Ash turns out to be evil—and, as mentioned, an android—in *Alien*, but he is a secondary evil; the main antagonist is undeniably the titular creature. Eldon Tyrell presents the same story—he is villainous, but a minor supporting role within the film.<sup>137</sup> Ultimately, the 1970s present something of a paradox, as threats the products of scientific progress represent to the future of humanity loom large in science fiction, but the scientist as character is most successful in the spotlight as something of a joke.

### **The 1980s: Entertaining Mad Men and Body Horror**

Movie culture as we know it in 2019 really begins in the 1980s. From the sequel-prequel-franchise craze, to the origins of the ongoing superhero era with *Batman* (1989) to the emergence of many of the filmmakers that are now considered the old guard—James Cameron, Tim Burton, Spike Lee, Jim Jarmusch, the Coen brothers—to the rise of independent film, “the eighties were a decade of tremendous change that gave the Hollywood industry and American film its modern shape and form.”<sup>138</sup> The “greatest vitality” of any genre in the era was “unquestionably” to be found “in horror and fantasy/science fiction,” from the rise of the teen slasher film with the arrival of the *Nightmare on Elm Street* and *Friday the 13<sup>th</sup>* series to a bevy of hugely successful science-fiction films including the latter two installments of the original *Star Wars* trilogy—*The*

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<sup>136</sup> Mel Brooks, "Young Frankenstein," (20th Century Fox, 1974); Jim Sharman, "Rocky Horror Picture Show," (20th Century Fox, 1975).

<sup>137</sup> Scott, "Blade Runner."; "Alien."

<sup>138</sup> Stephen Prince, "Introduction: Movies and the 1980s," in *American Cinema of the 1980s*, ed. Stephen Prince (New Brunswick: Rutgers University Press, 2007). 20

*Empire Strikes Back* (1980) and *Return of the Jedi* (1983)—in addition to several *Star Trek* films, *E.T. the Extra-Terrestrial* (1982) and *Ghostbusters* (1984).<sup>139</sup>

In science and technology news, the computer revolution got underway in earnest as computer technologies became compact and affordable enough for more widespread use. Automation started to reshape manufacturing processes while banking embraced automatic teller machines (ATMs). *Time* magazine named the personal computer the “Machine of the Year” for 1982 in lieu of their usual person of the year award. Apple introduced the Lisa in 1983 and then the far more successful Macintosh in 1984, followed by the Mac Plus in 1986 and the Mac II in 1987. However, International Business Machines (IBM) was consistently the largest computer firm in the world; Microsoft’s operating software, initially licensed only to IBM, went on to become the industry standard for all PCs by the end of the decade.<sup>140</sup>

NASA loomed large with its space shuttle program. The first operational mission of the space shuttle *Columbia* in 1982 saw the vehicle launch two communication satellites. The next year, Sally K. Ride became the United States’ first woman astronaut in space. However, after 24 successful missions, NASA had its worst PR disaster to date in January 1986 with the catastrophic *Challenger* launch that saw the space shuttle go up in flames a minute after takeoff in a widely watched live broadcast, killing all aboard, including school teacher Christa McAuliffe. NASA quickly became subject to the investigation of a presidential commission, which ultimately took considerable issue with NASA underestimating the known mechanical shortcomings of the spacecraft and putting the mission crew at risk. Discoveries made by the

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<sup>139</sup> Ibid, 17.

<sup>140</sup> "The 1980s Science and Technology: Topics in the News," in *Uxl American Decades*, ed. Julie L. Carnagie, et al., 1980-1989 (Detroit, MI: UXL, 2003).

commission also shed a harsh light on NASA's organizational structure, and NASA found its credibility and public image at an all-time low.<sup>141</sup>

The year 1986 was a big one for science and technology related disasters overall, with the explosion of a nuclear reactor at the Chernobyl Nuclear Power Plant near Kiev in Ukraine sending airborne radioactivity across Scandinavia and northern Europe, with fallout measured as far away as Scotland. It was also the year the *Exxon Valdez* oil tanker was completed, although that vessel would not become a major news story until 1989, when it ran aground on a reef off the coast of Alaska, spilling nearly eleven million gallons of crude oil into the ocean, killing hundreds of thousands of sea animals. Regarded as one of the worst manmade environmental disasters on record, cleanup efforts lasted over four years, but much of the damage could not be undone.<sup>142</sup>

Ozone levels were a major area of concern in the 1980s. In 1987, Los Angeles's ozone levels exceeded federal health standards for over a third of the year; New York City, Houston, and Philadelphia also exceeded federal standards for several weeks, though to a lesser degree than LA. Two years prior, scientists released the first ominous report of thinning in the ozone layer. Evidence that CFCs, in spite of the ban placed on aerosol use of the chemical compounds in 1978, were significant contributors to the problem came to light shortly after. Countries around the world signed the "Montreal Protocol" to phase out the production and use of CFCs at a United Nations sponsored conference in 1987, but many scientists still viewed the situation as bleak. Overall, the theme that science and technology, and therefore the scientific community, did not have the power to undo the damage it brought into the world—either gradually, as in the

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<sup>141</sup> Ibid.

<sup>142</sup> Ibid.

case of ozone levels, or via sudden disasters such as the Exxon Valdez spill or the Chernobyl nuclear plant—loomed large.<sup>143</sup>

In non-manmade disaster news, Mount St. Helens erupted in 1980 in one of the largest volcanic explosions in recorded North American history. Scientists predicted the impending eruption and advised a quarter of a million residents determined to be in dangerous proximity to evacuate. While various precautions put in place undoubtedly saved many lives, scientists underestimated the blast radius of the eruption. While 16 miles was anticipated to be the minimum safe distance, some residents 18 miles north of the volcano were killed by debris, ash, and lethal gasses released in the eruption.<sup>144</sup> In this context, it might seem somewhat counterintuitive that the 1980s actually mark something of a low point for the disaster movie between the peaks of the 1970s and the late 1990s through the early 2000s, but at least some of this could be attributed to limitations in visual effects capabilities. However, when the disaster genre does make a comeback in the 1990s, volcanoes (*Volcano*, *Dante's Peak*) do feature quite prominently.

When it comes to scientists in the movies, the 1980s feature two particularly notable trends: first, a marked upswing in the prevalence of scientist characters featuring in romances and romantic subplots, diverging from the overwhelming asexuality or dysfunctional sexuality of scientist characters seen in prior decades, and second, a resurgence of mad scientist narratives in the latter half of the decade. Furthermore, he (these mad scientists were, in keeping with the trend, overwhelmingly men) was actually kind of cool—even a rock star, in the case of *The Adventures of Buckaroo Banzai Across the Eighth Dimension*.<sup>145</sup>

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<sup>143</sup> "The 1970s Science and Technology: Chronology."; "The 1980s Science and Technology: Topics in the News."

<sup>144</sup> "The 1980s Science and Technology: Topics in the News."

<sup>145</sup> W. D. Richter, "The Adventures of Buckaroo Banzai across the 8th Dimension," (20th Century Fox, 1984).

The year 1981 brought the film *Continental Divide*, one of the first Hollywood romantic comedies to feature a scientist lead since 1938 saw the release of *Bringing Up Baby*, and notably one of relatively few films ever to feature a scientist character in a romance that does not dip into the realm of science fiction.<sup>146</sup> A “pleasantly old-fashioned Hollywood love story” that taps into both the familiar “fish out of water” and enemies-to-lovers narrative patterns, the film’s premise involves an urbanite investigative journalist who reluctantly accepts an assignment to write a profile of a reclusive, media-hostile ornithologist who studies bald eagles at a National Park.<sup>147</sup> The film was only a moderate historical success but holds a significant position in film history for being the first film produced by Steven Spielberg’s newly-formed Amblin Entertainment.

The biggest box-office success of 1982 was *E.T. the Extra-Terrestrial*, a film about the unlikely friendship between a young boy and a wrinkly-skinned alien botanist resembling a cross between a pug dog and Albert Einstein in his later years.<sup>148</sup> As *New York Times* chief film critic Vincent Canby wrote in his year’s end review, “Without warning [...] Steven Spielberg’s ‘E.T. the Extra-Terrestrial,’ designed to be a nice, unassuming family film, became the kind of runaway hit that happens once or twice in a decade.”<sup>149</sup> Notably, even though the alien scientist here is characterized positively, he is still fundamentally “other” in his alien status.

The latter half of the 1980s was arguably the best time for movie mad scientists outside the 1930s. The year 1985 alone introduced two incredibly distinctive mad scientists in “Doc” Brown (*Back to the Future*) and Herbert West (*Re-Animator*). On one hand, the films could hardly be further apart: the first, a family-friendly comedy distributed by a major studio and an

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<sup>146</sup> Michael Apted, "Continental Divide," (Universal Pictures, 1981).

<sup>147</sup> Gene Siskel, "'Divide' Conquers with Belushi, Charm," *Chicago Tribune*, 18 September 1981, C3.

<sup>148</sup> Steven Spielberg, "E.T. The Extra-Terrestrial," (Universal Pictures, 1982).

<sup>149</sup> Vincent Canby, "Amid Gloom, Good Comedy Staged an Exhilarating Comeback," *New York Times*, 26 December 1982.

instant box-office hit capitalizing off of star Michael J. Fox's popularity from the hit sitcom *Family Ties*, the second an X-rated horror independently produced and distributed and featuring a cast of unknowns. On the other, they are similar in that their main mad scientists are not the villains of their respective films.

Universal, the prime purveyor of mad scientist horror films in the 1930s and 40s, ironically enough also developed the film that introduced the most affable mad scientist of mainstream American cinema in Emmett "Doc" Brown. With his wild eyes and unkempt white hair pointing in all directions, in appearance he is perhaps the most direct descendant of prototypical mad inventor Rotwang since the original appeared in Fritz Lang's *Metropolis* (1927). Doc Brown's specialty is "all the sciences," though with his stolen plutonium, time machine, and pet dog named after Albert Einstein, he most strongly correlates to the iconography of a physicist.

Doc Brown fits cleanly within the "mad scientist" archetype in behavior as well as appearance: a social outcast whose only friend is a teenage boy, he is widely considered a "real nut case," has absolutely no concept of social norms, and, among other things, engages with "Libyan nationalists" to get his hands on stolen weapons-grade plutonium under the false pretense of building them a bomb before double-crossing them to use the substance to power a time machine he invented. In sum, the only thing that separates him from Rotwang—or perhaps more accurately, considering the plutonium, Dr. Strangelove—is the absence of malicious intent.<sup>150</sup>

While supporting player as opposed to protagonist, Doc Brown has since come to be regarded as one of the most iconic film characters of all time.<sup>151</sup> He also exemplifies a particular

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<sup>150</sup> Robert Zemeckis, "Back to the Future," (Universal Pictures, 1985).

<sup>151</sup> "The 100 Greatest Movie Characters," *Empire*, June 2015.



trend in the cinematic depiction of scientists that has grown increasingly prevalent in the past several decades. That is, he is depicted as a scientist-of-all-trades, an omni-scientist. Doc Brown's method is chaos, for him there is no distinction between "invention" and "experiment," concepts like control conditions or reproducibility are evidently not in his repertoire. He is surrounded, and therefore visually defined, by the iconography of science, and therefore culturally interpreted as a scientist, but in his actual methods and practice he is really better described as a tinkerer or an inventor.

In *Re-Animator*, medical student Herbert West—who has also become an iconic character, albeit within the more niche community of horror film fandom—has a single-minded focus on creating a life-restoring "reagent" instead of a time machine. While loosely based on an H. P. Lovecraft character of the same name, West's obvious cinematic antecedent is Peter Cushing's Dr. Frankenstein. Both are of a particularly cold and detached demeanor, lacking any particular interest or concern in the affairs or wellbeing of other people and possessing a single-minded devotion to unlocking the "secret of life"—a stark contrast to the flamboyant eccentricity of mad scientists of the Doc Brown lineage. However, much like Doc Brown, the closest thing West has to a friend, roommate Dan Cain, fills the film's main protagonist role, and has a certain number of similarities to *Back to the Future* protagonist Marty McFly. Namely, they are both brown-haired men with girlfriends who are generally unremarkable and are stuck dealing with the fallout of the creations of their respective mad scientist associates.<sup>152</sup>

The highest-grossing film of 1986, *Top Gun*, also technically features a scientist in love interest Charlotte "Charlie" Blackwood, an instructor at the "Topgun" naval fighter school in spite of her civilian status due to, as the film informs, her credentials as an astrophysicist. What

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<sup>152</sup> Stuart Gordon, "Re-Animator," (Empire International Pictures, 1985).

an astrophysicist does, however, is no clearer by the time the end credits role than it is in the first scene of the film. Beyond displaying some basic knowledge of fighter planes and a few scenes of her teaching which serve the purpose of highlighting her stiletto heels and stocking-clad calves or, later on, lingering flirtatious glances between herself and student Pete “Maverick” Mitchell, Charlie’s character is purely that of the supporting love interest. She is Pete’s emotional support, a ready supplier of pep-talks.<sup>153</sup>

The most memorable scientist character of the year came in David Cronenberg’s reimagining of *The Fly*, with the career-making performance of Jeff Goldblum as Seth Brundle, a brilliant but deeply insecure physicist who invents a teleportation device and accidentally intersplices his genome with that of a fly.<sup>154</sup> While displaying a fusion of science fiction and horror is common, *The Fly* (1986) is unusual in its heavy use of romantic and tragic elements. Brundle, as will be addressed at length in chapter 4, is more or less presented as a rather typical movie scientist stereotype—isolated, virginal, socially inept—only for the film to deconstruct these stereotypes. Since the success of *The Fly*, Goldblum has gone on to play a number of other scientist and more general STEM-related characters, including one of his most iconic roles, chaotician Ian Malcolm in *Jurassic Park* (1993).

While the late 1970s and 1980s saw a resurgence of the horror genre—and particularly body horror, scientists overall played a smaller role in the horror films than they did in the 1930s-50s. In keeping with the trend that began in the 1960s, “mad scientists” were usually seen in films that were more comedic than horrific—even if they were, on occasion, incredibly gory (i.e. *Re-Animator*). Scientists were still overwhelmingly depicted as white and male, though a

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<sup>153</sup> Tony Scott, "Top Gun," (1986).

<sup>154</sup> David Cronenberg, "The Fly," (20th Century Fox, 1986). This film will be analyzed at length in chapter 4.

handful of prominent female scientist characters did make appearances. In keeping with the same trend noticed in 1950s science fiction films, these characters are consistently love interests.

### **1990s: The Action-Scientist in the Computer Age**

The “genre” of the 1990s was action—“broadly defined to include cop films, spy movies, certain epic science fiction films, gangster extravaganzas, martial arts movies, and more”—drawing in both male and female viewers with “the explosions, the special effects, the stunts, the buff male and female bodies.”<sup>155</sup> From beginning to end, films like *Terminator 2: Judgement Day* (1991), *Independence Day* (1996), and *Star Wars: Episode I – The Phantom Menace* (1999) made up the bulk of the decade’s biggest winners at the box office.<sup>156</sup> The decade was also unique for the frequency with which major leading men known for playing action heroes, ranging from Sean Connery (in 1992’s *Medicine Man*) to Harrison Ford (in 2000’s *What Lies Beneath*), took on scientist roles.

Much like the 1950s were the atomic age and with the 1960s came the “Biological Revolution,” the 1990s brought the digital era. In 1990 the first known web page was written; three years later the World Wide Web came along. Amazon.com launched in 1995, the same year that *Toy Story* became the first feature-length film created entirely using computer-generated imagery (CGI). Where the Apollo launches were viewed on television, the *Pathfinder* space probe’s exploration of Mars’ surface was viewed via webcast in 1997. Google was founded the following year.<sup>157</sup>

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<sup>155</sup> Chris Holmlund, "Introduction," in *American Cinema of the 1990s*, ed. Chris Holmlund (New Brunswick: Rutgers University Press, 2008), 15.

<sup>156</sup> Box Office Mojo, "Yearly Box Office (U.S. Domestic)," <https://www.boxofficemojo.com/yearly/>.

<sup>157</sup> Chris Holmlund, "Timeline: The 1990s," in *American Cinema of the 1990s: Themes and Variations*, ed. Chris Holmlund (New Brunswick: Rutgers University Press, 2008).

One of the biggest life science news stories of the decade came along in 1997 in the form of Dolly the sheep, the first mammal to be successfully cloned.<sup>158</sup> While perhaps the biggest, Dolly was far from the only development in cloning to receive significant press attention. The first reported successful cloning of human embryo cells in 1993, for example, received considerable press coverage, including making it to the front page of *The New York Times*.<sup>159</sup>

While the developments in computer science seeped quickly into everyday life, with digital technologies revolutionizing communication and taking root in everyday vernacular, how developments like cloning and genetic engineering—1994 brought the release of the first commercialized genetically modified food with the Flavr Savr tomato—would go on to effect everyday life was not so instantly apparent, though the movies seemed to have quite a lot to say on the subject. *Jurassic Park* (1993), adapted from Michael Crichton's 1990 novel of the same name, depicts the resurrection of dinosaurs using genetic engineering—a film only visually feasible through cutting-edge developments in CGI. Hollywood imagined a near future in which reproductive technologies have led to eugenics-driven society *Gattaca* (1997), a box-office flop that has avoided falling into obscurity, through, among other things, becoming “one of the most frequently used movies in high school science classes.”<sup>160</sup>

The record-breaking success of Steven Spielberg's *Jurassic Park* (1993) has been primarily attributed to a significant increase in the importance placed by filmmakers on “realism” in seeking to create a box office hit.<sup>161</sup> David A. Kirby further identifies three different components of film realism: naturalism (visual realism), narrative integration (dramatic realism),

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<sup>158</sup> Alan Petersen, "Replicating Our Bodies, Losing Our Selves: News Media Portrayals of Human Cloning in the Wake of Dolly," *Body & Society* 8, no. 4 (2002).

<sup>159</sup> Gina Kolata, "The Hot Debate About Cloning Human Embryo," *The New York Times*, 26 October 1993.

<sup>160</sup> Jacob Clark Blickenstaff, "Still Relevant: *Gattaca* at 14," *NSTA Reports*, May 2011. I can also attest to the film's high school classroom use from personal experience.

<sup>161</sup> Chuck Kleinhans, "Movies and the New Economics of Blockbusters and Indies," in *American Cinema of the 1990s: Themes and Variations*, ed. Chris Holmlund (New Brunswick: Rutgers University Press, 2008).

and authenticity (scientific realism).<sup>162</sup> Such is the popularity of Spielberg's film and its many subsequent sequels that the visions of dinosaurs presented therein have become the standard. The appearance, sounds, and behaviors of the *Jurassic Park* dinosaurs were rooted in scientific evidence and prevailing hypotheses at the time, but still ultimately boiled down to conjecture. As such, it was those ideas that were supported by paleontologist Jack Horner, the primary scientific consultant on the first three *Jurassic Park* films, that were realized in the film and therefore took hold in the public imagination.

In fact, Horner was able to put his theories front and center in the film—most notably, the hypothesis that birds evolved from dinosaurs; a hypothesis of which Horner was a strong proponent and that the film presents as the “radical” brainchild of protagonist Alan Grant.<sup>163</sup> Though this hypothesis has since gained much wider acceptance, it was a point of considerable contention in 1993.

As Spielberg and his colleagues highly prioritized authenticity in their depictions of dinosaurs, Horner's opinions carried considerable clout throughout the film's production, and Horner used that clout to shape the film into one that presents a compelling case for the bird-from-dinosaur hypothesis. As Kirby himself mentions, it's hard not to wonder, “would we look at birds or dinosaurs the same way today if bird-from-dinosaur opponents—such as University of Kansas paleontologist Larry Martin or Wesleyan University developmental biologist Ann Burke—had served as *Jurassic Park*'s science consultant?”<sup>164</sup>

Another crucial impact the release of *Jurassic Park* had on the broader scientific community came in the nascent field of Ancient DNA studies, which has only since been pushed

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<sup>162</sup> Kirby, *Lab Coats in Hollywood: Science, Scientists, and Cinema*, 16.

<sup>163</sup> *Ibid.*, 127-8.

<sup>164</sup> *Ibid.*, 131.

further and further into the spotlight with the rise of commercial DNA testing kits that return estimates of customer's ancestry and include categories for various geographical regions as well as a handful of other categories including "Neanderthal DNA." One scientist working in the ancient DNA studies commenting in an interview that, "If there was no *Jurassic Park*, I don't know how ancient DNA would be today."<sup>165</sup> Others in the field have noted how Crichton's book and especially the film series brought people to the field, and how the considerable media coverage of the field—coverage which frequently uses *Jurassic Park* as a hook or framing device—has contributed to ancient DNA studies becoming a particularly competitive area. In interviews, one scientist stated, "I know a couple of people who've said they've never come across anything quite as vicious and nasty as the ancient DNA field," while another described the highly competitive relationship between the first (80s/90s) and second (2000s) generation of ancient DNA researchers in patricidal terms ("the children have killed their parents").<sup>166</sup>

But returning to the film itself, it must be addressed that *Jurassic Park* features both scientist heroes and also a burgeoning scientist villain in geneticist Dr. Henry Wu, the chief genetic engineer of InGen, the biotechnology startup responsible for the resurrection of the dinosaurs, a character whose role in the original novel is largely supplanted in the film by an instructive cartoon featuring the anthropomorphized "genetic material"—bouncy polka dots topped with a pair of googly eyes—known as "Mr. DNA." And as film critic Christopher Campbell writes, "don't be fooled by the cute portrayal [...] Mr. DNA is a bad guy."<sup>167</sup> While Wu's role is minor in *Jurassic Park*, he has gone on to become a major antagonist in the ongoing

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<sup>165</sup> Elizabeth Dobson Jones, "The Search for Ancient DNA in the Media Limelight: A Case Study of Celebrity Science" (University College London, 2017), 110.

<sup>166</sup> Guillermo del Toro, "The Shape of Water," (Fox Searchlight Pictures, 2017); Jones, "The Search for Ancient DNA in the Media Limelight: A Case Study of Celebrity Science," 166, 167.

<sup>167</sup> Christopher Campbell, "DNA in Movies: The Science That's Evil in Fiction and Heroic in Documentary," April 2014, <https://filmschoolrejects.com/dna-in-movies-the-science-thats-evil-in-fiction-and-heroic-in-documentary-ead0db4301c4/>.

*Jurassic World* sequel series, falling into the now well-established film tradition of the evil genetic engineer that has maintained a steady cinematic presence since the late 1970s.

The 1990s also saw the revival of the disaster film genre, and these disasters truly took all forms, from killer comets in *Deep Impact* and *Armageddon* (both 1998) to the threat of global pandemic in *Outbreak* (1995).<sup>168</sup> In the film, the “Motaba virus”—basically Ebola, but with the fatality rate bumped up from 50% to 100%—begins to spread in the Democratic Republic of the Congo, and a military scientist is sent to investigate. Unlike the scientists of *The Andromeda Strain* (except for Dr. Stone), Col. Sam Daniels of the U.S. Army Research Institute is not an outside expert called in by the military to save the day, but a well-integrated cog in the military machine. Only, Daniels’ efforts are doomed to be undermined, as an infected monkey is already en route to the United States to be sold as an exotic pet. Much like *The Andromeda Strain*, a plot twist reveals that the U.S. military had secretly been experimenting on the Motaba virus with the intent of weaponizing it. The good news is that they also developed an antidote. The bad news is that the virus has mutated and the antidote is no longer effective. Oops. Not to worry, though—Sam realizes that the monkey that brought the virus to the United States has antibodies can be used to generate an antiserum, tracks down the monkey in the nick of time, and saves the day.

Female scientists came to appear more frequently on screen throughout the decade, as seen in films such as *Outbreak*, *Jurassic Park*, and *The Saint* (1997). However, demographically they remain overwhelmingly white and usually supporting as opposed to lead roles. The 1997 film *Contact*, often regarded as one of the more positive and scientifically nuanced portrayals of scientists to hit the big screen in the past few decades, is also significant in having a female scientist, Ellie Arroway, in the lead role.<sup>169</sup>

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<sup>168</sup> Wolfgang Petersen, “Outbreak,” (Warner Bros., 1995).

<sup>169</sup> Grazier and Cass, *Hollyweird Science: From Quantum Quirks to the Multiverse*, 59.

## 2000s: Superheroes and Mega-Franchises and the Scientist Becomes Asexual Again

Much like the 1980s, the 2000s brought a wave of science fiction remakes, similarly motivated the appeal of producing a film with a pre-established fanbase was particularly incentivized by technological advancements. The huge role these technological advancements played in incentivizing these waves of remakes can be seen in the distinct natures of these two films. The body horror of *Invasion of the Body Snatchers* (1978), *The Thing* (1982), and *The Fly* (1986) reflect particular advancements in prosthetics and visual effects in the late 1970s and '80s, whereas the possibilities generated by developments in CGI are strongly reflected in the large-scale alien invasion type films prominent among 2000s remakes such as *War of the Worlds* (2005) and *The Day The Earth Stood Still* (2008).<sup>170</sup>

In addition to a decided trend in the sort of science fiction films that were favored, the 2000s wave of remakes also feature a particularly relevant trend regarding *how* these old stories were renovated. Namely, they are overwhelmingly “de-sciented,” for lack of a better term. For instance, where the original *Planet of the Apes* (1968) featured its female lead, Zira, as a psychologist, and generally depicts Ape City as full of scientists and surgeons, *Planet of the Apes* (2001) spotlights Ari, an activist, and depicts the ape-ruled planet of Ashlar as being overwhelmingly populated by military types.<sup>171</sup> In 2005, Steven Spielberg remade *War of the Worlds*, replacing the atomic scientist protagonist of the 1953 version with a dock worker played by Tom Cruise.<sup>172</sup> In both films, scientist characters and scientific themes present in the original

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<sup>170</sup> Stephen Prince, "Dread, Taboo, and *the Thing*: Towards a Social Theory of the Horror Film," in *The Horror Film*, ed. Stephen Prince (New Brunswick: Rutgers University Press, 2004). Newman, *Nightmare Movies: Horror on Screen since the 1960s*, 402-3.

<sup>171</sup> And notably, not military scientists; Franklin J. Schaffner, "Planet of the Apes," (20th Century Fox, 1968); Tim Burton, "Planet of the Apes," (20th Century Fox, 2001).

<sup>172</sup> Byron Haskin, "War of the Worlds," (Paramount Pictures, 1953); Steven Spielberg, "War of the Worlds," (Paramount Pictures, 2005).



are minimized or removed entirely. This “de-scienceing” trend was not universal. Scientists and science remain just as prominent in the 2008 remake of *The Day the Earth Stood Still* as they are in the 1951, with the 1950s fear of nuclear annihilation replaced by the threat of global warming to maintain relevancy.<sup>173</sup> However, not only has the “de-scienceing” trend continued in the 2010s, but has become more prominent.

In addition to a wave of remakes, the earlier 2000s in particular saw a continuation in the disaster film trend also partially inspired by the possibilities created by advancements in CGI. *The Day After Tomorrow* (2004), one of the last major releases in this disaster boom, is arguably the films of this second disaster boom that harkens back most significantly to the first, as it does not just follow the same basic formula—ensemble cast bands together to survive catastrophe—but pulls its central concept from that era, as the last time members of the scientific community got nervous about the Earth rapidly approaching another ice age was the 1970s.<sup>174</sup>

The 2000s also marked the rise of the superhero boom that continues to this day, with the establishment of the ongoing 20<sup>th</sup> Century Fox *X-Men* series and the start of the now-behemoth Marvel Cinematic Universe (MCU) with *Iron Man* (2008). Christopher Nolan’s hugely Batman reboot, *The Dark Knight* trilogy, released its first two installments, *Batman Begins* (2005) and *The Dark Knight* (2008), contributing significantly to the trajectory of the superhero genre and helping inspire a wave of reboots including *Star Trek* (2009) and sequels and the *Rise of the Planet of the Apes* (2011) trilogy.

Especially compared to the lineup of superheroes introduced in the 2010s, the 2000s featured a high volume of scientists-turned-superheroes. *X-Men* and sequels feature Charles

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<sup>173</sup> Warren, *Keep Watching the Skies! American Science Fiction Movies of the Fifties* 214 Scott Derrickson, "The Day the Earth Stood Still," (20th Century Fox, 2008).

<sup>174</sup> Roland Emmerich, "The Day after Tomorrow," (20th Century Fox, 2004).

Xavier, a geneticist.<sup>175</sup> Two iterations of Bruce Banner hit the screen in short succession—a geneticist in *Hulk* (2003) and then a nuclear physicist/biochemist in *The Incredible Hulk* (2008).<sup>176</sup> Peter Parker was the star of the *Spider-Man* trilogy (2000, 2004, 2007), not yet a scientist but a scientist-in-training majoring in physics at Columbia University. The MIT-trained “genius billionaire playboy philanthropist” Tony Stark, an omni-scientist and inventor of unspecified training, became the backbone of the nascent MCU starting with *Iron Man* (2008).<sup>177</sup> Geneticist Sue Storm and physicist Reed Richards made up two of the *Fantastic Four* (2005) and its sequel, *Fantastic Four: Rise of the Silver Surfer* (2007).<sup>178</sup> Overall, over half of the major superhero films released in the 2000s starred scientist-superheroes.<sup>179</sup> However, within these films, the scientific credentials of villains were even more widespread. Every film series mentioned above features at least one scientist supervillain, as do some others that feature a scientist villain with no heroic counterpart.

Throughout the 2000s, the asexuality of scientists also returns with a vengeance. Dr. Crane, for instance, is ultimately the only major villain of Christopher Nolan’s Batman trilogy (the others being Ra’s al Ghul, the Joker, Harvey Dent, Bane, and Talia al Ghul) not to feature or at the very least mention a love interest—and also the only villain among them who is a

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<sup>175</sup> It is worth noting, however, that Xavier is never shown doing research. He is shown as a teacher, both generally wise and knowledgeable in what the film’s version of “genetics” is—a mentor, but not an experimenter. Even when his younger version is introduced in the prequel series, he really only brings up genetics to try to flirt with women by telling them all about their “groovy mutations” (one woman has heterochromia, another has auburn hair), and, as is the case with his older version, is never shown doing laboratory work; Bryan Singer, “X-Men,” (20th Century Fox, 2000); Matthew Vaughn, “X-Men: First Class,” (20th Century Fox, 2011).

<sup>176</sup> Ang Lee, “Hulk,” (Universal Pictures, 2003); Louis Leterrier, “The Incredible Hulk,” (Universal Pictures, 2008).

<sup>177</sup> Jon Favreau, “Iron Man,” (Paramount, 2008).

<sup>178</sup> Tim Story, “Fantastic Four,” (20th Century Fox, 2005); “Fantastic Four: Rise of the Silver Surfer,” (20th Century Fox, 2007).

<sup>179</sup> Specifically, 11 of the 17 superhero films (65%) released 2000–2009 that ranked in the top 20 highest grossing films (U.S. domestic box office) of their release year featured scientist superheroes, box office statistics retrieved from [BoxOfficeMojo.com](http://BoxOfficeMojo.com).

scientist.<sup>180</sup> In the science-fiction thriller *Sunshine* (2007), protagonist Robert Capa, the team physicist aboard the *Icarus II* space mission—ironically enough, also played by Dr. Crane actor Cillian Murphy—originally had a romantic subplot with pilot Cassie, including a sex scene that would have made the film a noteworthy exception to the general trend Vivian Sobchack noted in her oft-cited essay on “The Virginity of Astronauts.”<sup>181</sup> However, this scene, and their entire romantic subplot, was ultimately left on the cutting room floor.

In 2008, the National Academy of Sciences founded the Science and Entertainment Exchange, a “science/entertainment matchmaker” designed to match Hollywood productions to scientists with corresponding areas of expertise.<sup>182</sup> However, if the initiative was supposed to inspire an increase in science-focused mainstream films or increased accuracy in the portrayal of scientific procedure, culture, or technical information, no such trend has yet manifested.

### **2010s: The Sidelined Scientist (and *The Martian*)**

Although the contemporary superhero era dawned in the 2000s, it really comes of age in the 2010s. In addition to consuming the box office, the superhero genre now engulfs the majority of movie scientists. While, as mentioned, some of the scientists are the superheroes themselves, this has been far less true of superheroes introduced in the 2010s than it was in the decade prior. In fact, unless one counts the MCU recasting of Bruce Banner in *The Avengers* (2012; Mark Ruffalo replaced Edward Norton) and the introduction of the younger versions of Charles Xavier and Hank McCoy in *X-Men: First Class* (2011) as “new” characters, none of the heroes

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<sup>180</sup> Christopher Nolan, "Batman Begins," (Warner Bros., 2005); "The Dark Knight," (Warner Bros., 2008); "The Dark Knight Rises," (Warner Bros, 2012).

<sup>181</sup> Vivian Sobchack, "The Virginity of Astronauts: Sex and the Science Fiction Film," in *Bridges to Science Fiction and Fantasy: Outstanding Essays from the J. Lloyd Eaton Conferences*, ed. Gregory Benford, et al. (Jefferson: McFarland & Company, 2018); Danny Boyle, "Sunshine," (Fox Searchlight Pictures, 2007).

<sup>182</sup> Grazier and Cass, *Hollyweird Science: From Quantum Quirks to the Multiverse*.

introduced in any of the Marvel or DC comic book films since 2010 have been scientists. On the opposite side, the scientist-villain trend has continued—Dr. Curt Connors in *The Amazing Spider-Man* (2012), Aldrich Killian and Maya Hansen in *Iron Man 3* (2013), Bolivar Trask in *X-Men: Days of Future Past* (2014), Dr. Zander Rice in *Logan* (2017), Carlton Drake in *Venom* (2018)—though to a less overwhelming degree than in the 2000s, as preternaturally powerful aliens and supernatural beings have become more popular villain archetypes.<sup>183</sup>

Not all scientist characters introduced in superhero movies since 2010 have been villains. In *Thor* (2011) and *Thor: The Dark World* (2013), astrophysicist Jane Foster is the titular superhero's love interest. However, overwhelmingly the non-villainous scientists introduced in superhero films since 2010 have been “technical support” types, with one of the most notable examples being the omni-scientist Shuri in *Black Panther* (2018), depicted as the nation of Wakanda's singular source for scientific and technological advancement in everything from weaponry to medicine.

In other genres, the resurgence of scientist biopics started by *A Beautiful Mind* also continues in the 2010s, as does the emphasis on the sex lives of social scientists (*A Dangerous Method*, *Professor Marsten and the Wonder Women*) and scientific work of the equations-on-a-blackboard variety (*The Theory of Everything*, *The Imitation Game*, *Hidden Figures*)—in other words, nothing with microscopes, test tubes, or Petri dishes.<sup>184</sup>

The “de-scienceing” of science-fiction has continued in a major way, with perhaps the most emblematic example being the sequel/“soft reboot” of the *Jurassic Park* franchise with *Jurassic World* (2015). Where paleontologists and paleobotanists served as the protagonists of

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<sup>183</sup> It is worth noting that all of the scientist-villains listed here are involved in genetic engineering, with the exception of Bolivar Trask, a military scientist who creates a line of artificially intelligent robots that end up bringing about the apocalypse.

<sup>184</sup> This trend will be discussed at greater length in chapter 3.

the franchise's first film trilogy, *Jurassic World* (2015) and *Jurassic World: Fallen Kingdom* (2018) center around dinosaur trainer Owen Grady and operations manager Claire Dearing. While the film refers to Grady as an "ethologist," he is very much depicted primarily as an animal handler with knowledge sourced from first-hand experience interacting with particular dinosaurs as opposed to book study or detached observation; the "Jurassic World meme" that quickly went viral online in which zookeepers mimicked a particular shot from the film featuring Grady and "his" velociraptors with their own animals further indicates that audiences very much interpret Grady's character in this vein.<sup>185</sup>

The only character from the original *Jurassic Park* trilogy to return to the current series in a narratively significant way is biotechnologist/geneticist Dr. Henry Wu as a recurring villain. *Jurassic World: Fallen Kingdom* makes his villainy more central to the franchise's overarching plot through the introduction of "genetic power" and weaponized designer dinosaurs.<sup>186</sup> I would attempt to deconstruct the concept of "genetic power," only the film does not provide anything resembling an explanation for the term beyond that it is delivered with the same general inflection and gravitas that one might expect to hear "nuclear power" uttered in a 1950s creature feature. What is clear, however, is how far the franchise has veered from the Jack Horner sourced stances of the first film. The original *Jurassic Park* presented a conception of dinosaurs and dinosaur evolution that was "'naturalized' in the cinematic space, and propagated this interpretation as naturally authentic,"<sup>187</sup> while the new series, with its emphasis on dinosaurs genetically engineered to best serve various commercial or military purposes, gives the

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<sup>185</sup> Colin Trevorrow, "Jurassic World," (Universal Pictures, 2015); Kevin McFarland, "Zookeepers Are Recreating Jurassic World's Raptor Training."

<sup>186</sup> J. A. Bayona, "Jurassic World: Fallen Kingdom," (Universal Pictures, 2018).

<sup>187</sup> Kirby, *Lab Coats in Hollywood: Science, Scientists, and Cinema*, 131.

filmmakers carte blanche to do whatever they want with the design of the dinosaurs, a conscious cutting loose of the restraints put in place by trying to conform to the paleontological record.

Another example of the “de-scienceing” trend can be seen in *Arrival* (2016), often held up as one of the best examples of “serious” science fiction in recent years.<sup>188</sup> In the film, a professional woman attempts to communicate with alien visitors much to the derision of her overwhelmingly male colleagues, but unlike *Contact*, the protagonist is not defined as a scientist. Instead, Louise Banks is a linguist, and within the film introduced and characterized in *contrast* to the film’s designated scientist—Ian Donnelly, a physicist whose glasses and total lack of manners introduce him as being of the common socially inept lineage of movie scientists. Both are recruited by the U.S. Army to help respond to the sudden arrival of an extraterrestrial spacecraft. At a key turning point early in the film when Louise is trying to convince their superior, Colonel G. T. Weber, to give her time to attempt communicating with the aliens before moving to more aggressive tactics, she erases a board full of Ian’s equations to write out a demonstration; Ian’s immediate shout of protest turns out to be the last time we see his character do anything that indicates he is a physicist. When Louise’s approach shows indications of succeeding in a meeting with the aliens shortly thereafter, Ian transforms into her full-time assistant, with nary a mention of his supposed area of expertise again. At its core, it is the same old alien visitor story from 1951, and while it chooses the *Day The Earth Stood Still* attitude and depicts communication, not conflict, as the right way to go, the scientist figure is no longer spearheading the communication movement, but a bystander.

Another example of the increasingly sidelined and problematized role of movie scientists can be seen in the 2018 Academy Award winner for Best Picture, *The Shape of Water* (2017),

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<sup>188</sup> Denis Villeneuve, “Arrival,” (Paramount, 2016).

Guillermo del Toro's reimagining of *The Creature from the Black Lagoon* as an interspecies fairytale-esque romantic drama.<sup>189</sup> The film, set in 1962, revolves around a mute woman, Elisa, who works as a cleaner in a secret government research facility and falls in love with an amphibious humanoid known as the "Amphibian Man" being held hostage there. She determines to break him out with help from her two closest friends, Zelda and Gerald. However, their rescue plan hits a few bumps and the outcome looks bleak until an unlikely ally appears: the scientist Robert Hoffstetler, employed by the lab and secretly a Soviet spy named Dimitri Mosenkov—in other words, the Cold War era's ultimate scientific bogeyman. Under orders to kill the Amphibian Man, Hoffstetler ultimately decided that the destruction of life in this manner is contrary to his principles as a scientist and defies his orders.

However, when the breakout is discovered, the scientist quickly becomes the prime suspect of Richard Strickland, the US Army Colonel in charge of the "asset." Strickland tails Hoffstetler, who goes to meet a Soviet contact; this contact shoots Hoffstetler for somewhat ambiguous reasons. Strickland, still tailing his suspect, kills the attacker and then tortures Hoffstetler for information. Hoffstetler confesses Elisa and Zelda's involvement before he dies. In sum, not only does Hoffstetler suffer the worst fate of any character—the villainous Strickland is also killed, but receives a quick death—he is by far the most morally ambiguous figure in the film.

A supporting scientist character received a very similar narrative arc in an otherwise incredibly different film released the next year in *Venom* (2018), a superhero movie.<sup>190</sup> Although the film's primary villain, Carlton Drake, is specified to have started his company, the Life Foundation, with a genetic engineering breakthrough, he is coded more entrepreneur than

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<sup>189</sup> Toro, "The Shape of Water."

<sup>190</sup> Ruben Fleischer, "Venom," (Sony Pictures Releasing, 2018); Toro, "The Shape of Water."

research scientist, wearing a black blazer over a grey wool zip-up.<sup>191</sup> However, the film does feature a supporting scientist character who fits much more cleanly within the usual iconography of the movie scientist in Dr. Dora Skirth, a white lab coat and glasses-wearing research scientist in Drake's employ. A medical researcher (specialty and training unspecified), she appears to be one of the lead scientists involved in Drake's secret investigation into the capabilities of the alien creatures known as Symbiotes, which prominently features human testing on kidnapped homeless people. Ultimately, her conscience gets the better of her and she turns whistleblower, contacting investigative reporter Eddie Brock with an offer to sneak him into the Life Foundation for the purposes of writing an expose. Skirth's whistleblowing is quickly discovered by Drake, who kills her. Like Hoffstetler, Skirth's moral compass inspires her to defy orders, and she ends up dead for her troubles—and again, like Hoffstetler, the most prominent character in the film to die besides the main antagonist.

However, one notable exception to the “de-sciencing” trend does occur in the most prominent non-biopic film to star a scientist as its hero released in the 2010s: *The Martian* (2015), a film that received much attention for putting the emphasis “on the *science*, not the *fiction*, part of science fiction.”<sup>192</sup> Set in 2035, the film centers around Mark Watney, a member of the Ares III mission to Mars. An unexpected severe dust storm forces the team to abort the mission 18 days into a planned 31-day expedition, but as they evacuate Watney is struck by a large piece of debris and lost in the storm, presumed dead by the rest of his crew, who successfully return to their orbiting vessel *Hermes*. Watney manages to survive and make it back to the mission base. Upon contacting ground control, he becomes the subject of an international

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<sup>191</sup> As described, it suggests the implication that the discovery had to do with CRISPR, although the term is never specifically named in the film.

<sup>192</sup> Peter Gutiérrez, "Science and the Wonder of the Real," *Screen Education* 2015, 61.



rescue effort. As the people of Earth plan his rescue, Watney relies on his particular specialist knowledge—a botanist first and foremost, an engineer second—to keep himself alive on Mars for the interim.<sup>193</sup> The characterization of scientists in *The Martian* is more or less the direct antithesis of the usual movie scientist stereotypes—the Ares III team members are a close-knit group who crack jokes with each other and have various hobbies and interests outside science. The film also goes against the “omni-scientist” trend—Watney’s method of survival, potato farming, is dependent on his specialized knowledge as a botanist, which he openly acknowledges within the film.

Great successes often spark trends, but at least as far as movie treatment of scientist characters is concerned, this does not appear to be the case with *The Martian*, in spite of its critical and commercial acclaim. If there is any trend to be noted in scientist movie characters in the 2010s, it continues to be their narrative marginalization. They are supporting characters who provide necessary background information, gadgets, or plot points to the story and little else.

The horror genre in particular has shown a recent trend of not just putting scientists on the periphery but removing them entirely. In keeping with Andrew Tudor’s findings, science remains a major generator of horror, but while scientists used to be overwhelmingly present in key roles in either exacerbating or trying to combat the problems created by science, in the 2010s they are increasingly becoming absent figures. In Jordan Peele’s *Us* (2019), for example, it is explained that the doppelgängers known as “the Tethered” originated as a government research project that was then abandoned, with the Tethered left to live in the darkness of an extensive underground laboratory.<sup>194</sup> No scientist appears or is even mentioned by name over the course of the film, nor any suggestion given as to what happened to the ones who must have worked in

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<sup>193</sup> Ridley Scott, "The Martian," (20th Century Fox, 2015).

<sup>194</sup> Jordan Peele, "Us," (Universal Pictures, 2019).

these laboratories, abandoning their thousands and thousands of human test subjects and just as many test rabbits, leaving nary a lab coat nor a pair of glasses behind.

However, that is not to say that mainstream movies no longer maintain an important relationship with real-world science. In a certain regard, our current age of social media has perhaps even made this relationship more important. The best way to demonstrate this particular dynamic is through example, and recent news has provided an excellent one in the release of the first-ever image of a black hole—specifically, the supermassive black hole at the center of the M87 galaxy—via the Event Horizon Telescope Collaboration.<sup>195</sup>

Writing in 2011, David Kirby addressed the still in development film *Interstellar* (2014) in discussing the role of fictional film as a scientific modelling tool, as the film was developed from a script treatment from California Institute of Technology theoretical astrophysicist Kip Thorne, who was also heavily involved in the film's design of gravity fields and wormholes. Kirby notes:

“Currently, wormholes are only theoretical entities within the astronomical community; there is no direct evidence for their existence. Thorne is essentially designing these entities—as well as the scientifically based notion of traversable wormholes—based entirely on his theoretical models. When, and if, we are able to confirm that wormholes exist, they may indeed behave as in this film or they may look and behave completely differently.”<sup>196</sup>

Fast forward to April 2019, and the release of the first composite image of a black hole. Not only was the general consensus that *Interstellar*'s Gargantua, while not perfect, was not too far off,

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<sup>195</sup> Dennis Overbye, "Darkness Visible, Finally: Astronomers Capture First Ever Image of a Black Hole," *The New York Times*, 10 April 2019.

<sup>196</sup> Kirby, *Lab Coats in Hollywood: Science, Scientists, and Cinema*, 38.

but the film was also a key framing device in how the media reported the discovery.<sup>197</sup> The *New York Times* coverage of the image brings up the film in the second paragraph and a *WIRED* article mentions it in the first line.<sup>198</sup> Furthermore, the *Interstellar* connection made the image of the M87 black hole newsworthy for a number of prominent film and popular culture publications online, such as *IndieWire*—publications that would certainly not be reporting on the finding if it did not have a connection to a film, and particularly one made by a filmmaker with one of the largest and most active fanbases on the internet, Christopher Nolan.<sup>199</sup> As such, in the current age of digital media, depictions of science in popular culture can directly affect not only how real science news is reported, but how wide an audience that news reaches.

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<sup>197</sup> Christopher Nolan, "Interstellar," (Paramount Pictures, 2014).

<sup>198</sup> Overbye, "Darkness Visible, Finally: Astronomers Capture First Ever Image of a Black Hole."; Alex Baker-Whitcomb, "The First Black Hole Picture, Facebook Newsfeed Changes, and More News," *WIRED*, 10 April 2019.

<sup>199</sup> Zack Sharf, "Black Hole Photo Shows Christopher Nolan's 'Interstellar' Wasn't So Far Off from the Real Thing," *IndieWire*, 10 April 2019.

## Chapter Two

### **Space Science and Cinema: Predicting the Future, Framing the Past**

In an interview, Jet Propulsion Laboratory scientist Matt Golombek said that “Hollywood does a much better job of talking about NASA than NASA does itself.”<sup>200</sup> Of all scientific agencies, it is only NASA’s logo that has permeated popular culture in the way logos for major film and television franchises do, with NASA-branded products shelved alongside superheroes and merchandise for popular television shows at comic book stores. Perhaps one of the most recent examples that best demonstrates the way in which the NASA logo has permeated popular is that of British actor Jacob Anderson, who plays Grey Worm on the television series *Game of Thrones* and recently attended the BFI & Radio Times Television Festival to promote the highly anticipated final season of the series wearing a NASA shirt.<sup>201</sup> Consequentially, the numerous photographs and videos of Anderson at the festival that have since circulated online, shared by both fans on social media and various outlets writing coverage of the event, serve as the sort of product placement other companies might actively pay for—only, NASA gets it for free.

So how did NASA become so firmly embedded in popular culture? The following chapter will explore how fictional media, particularly film, has interacted with the image and progress of American space exploration—and therefore, NASA—over three periods. First, I will explore space exploration in cinema in the decades leading up to the founding of NASA until the conclusion of the US-USSR “space race” with the *Apollo 11* moon landing, emphasizing cinema’s function as what David Kirby refers to as a “diegetic prototype” of a manned lunar mission, “demonstrat[ing] to large public audiences a technology’s need, benevolence, and

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<sup>200</sup> Matt Golombek quoted in Kirby, *Lab Coats in Hollywood: Science, Scientists, and Cinema*, 53.

<sup>201</sup> "Game of Thrones Stars Jacob Anderson and Joe Dempsie at the BFI Radio Times TV Festival," British Film Institute, <https://www.youtube.com/watch?v=O6irWKgpeyU>.

viability.”<sup>202</sup> I will also look at the role of key “science boosters” and NASA-affiliated individuals as advisors to science fiction films throughout this period. In this section I will additionally address the establishment of a colonial conquest “outer space as frontier” analogy in science fiction from the first half of the 20<sup>th</sup> century, including the influential film *Destination Moon* (1950), that would go on to become a key feature of pro-space exploration and pro-NASA rhetoric.

Next, I will address NASA’s post-*Apollo 11* scramble for relevance and urgency following the conclusion of the “space race” and how the trajectory of the “space-frontier” mythos typical to science fiction, as seen in such films as *2001: A Space Odyssey* (1968) played a role in the pursuit of a space station/space shuttle program that has proven to be an impossible romantic vision. Last, I will address how the public relations goal of the ill-fated *Challenger* flight—to generate youth interest in NASA—has since the conclusion of the *Apollo* program been realized most successfully through fictional popular culture including cinema, putting particular emphasis on the five NASA history docudramas that have thus far received theatrical release in the United States: *The Right Stuff* (1983), *Apollo 13* (1995), *October Sky* (1999), *Hidden Figures* (2016), and *First Man* (2018). I will explore how these films have shaped and reshaped the myth of NASA as well as public memory of the organization’s history, making the case that celebratory depictions of NASA has consistently corresponded to better box office returns.

Overall, this chapter will elaborate on the two-way relationship between cinematic depictions of scientific topics and real-life scientific and technological developments, a trend addressed more generally in chapter 1. It will explore how fiction film has corresponded, and

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<sup>202</sup> David Kirby, "The Future Is Now: Diegetic Prototypes and the Role of Popular Films in Generating Real-World Technological Development," *Social Studies of Science* 40, no. 1 (2010), 43.

even in some small part contributed, to the development of American space exploration. I will discuss how film expresses some influence on the future of space travel by serving as a “diegetic prototype,” and how the overwhelmingly positive cinematic depictions of NASA, both in historical dramas and futuristic science-fiction contexts, play a key role in maintaining a positive public image of the organization.<sup>203</sup>

### **Lunar Missions from Fantasy to Reality**

The relationship between science fiction and real space science is multifold. In discussing the origins of human space travel, scholars debate whether to begin in the first half of the twentieth century with the theoretical work and nascent engineering work of such figures as Konstantin Tsiolkovsky, Robert Goddard, and Herman Oberth, or to trace these first practical entries back to their fictional roots—the fantastical stories of spaceflight written in the latter half of the 19<sup>th</sup> century, such as Jules Verne’s *From the Earth to the Moon* and H. G. Wells’ *The Men in the Moon*, that were the acknowledged inspirations for many who would go on to play key roles in making spaceflight a reality. Robert Goddard, who in 1926 became the first person to successfully launch a liquid-fueled rocket, credited Welles and Verne with sparking his interest in space travel.<sup>204</sup> With the invention of cinema, it too became one of the forms of fantasy that would go on to inspire real-life space scientists.

Within a decade of its invention, cinema took its first trip into space with Georges Méliès’ *A Trip to the Moon* (1902). For more than two decades, films occasionally travelled out of this world, but consistently as pure fantasy—and then in 1929 came *The Woman in the Moon* (*Die Frau im Mond*). An early example of a science-fiction film seeking expertise from scientific

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<sup>203</sup> *Ib id.*

<sup>204</sup> Howard E. McCurdy, *Space and the American Imagination*, 2nd ed. (Baltimore: Johns Hopkins University Press, 2011).

advisors—pioneering rocket scientist Hermann Oberth and popular science writer Willy Ley—*Woman in the Moon* also marks a key transition point in the relationship between space science and mainstream fiction film that continues to this day. The film’s director Fritz Lang, the most esteemed filmmaker in Germany following the groundbreaking spectacle of *Metropolis* (1927), set his sights on the moon and decided he wanted to bring in a technological expert with the thought that doing so would have significant promotional value.<sup>205</sup>

Oberth was initially hesitant, thinking that presenting his work in a fictional context might lead people to suspect its *impossibility* and not the reverse. However, he was soon swayed when the film production company Ufa offered him significant funding to build test rockets (before this time, lack of means had prevented Oberth from exploring the practical application of his theoretical work), imagining that these prototypes could be used in the film’s eventual promotion. He also figured the film’s premiere would provide him with prime opportunities to rub elbows with the *crème de la crème* of German society, as a Fritz Lang release, at that time, qualified as the event of the season.<sup>206</sup>

As Oberth’s interest was in rocketry, it was over the launch scene that he was most adamant about having final say. While there are many details about *Woman in the Moon*, and indeed, Oberth’s hypotheses, that would not hold up over time (the prototype rockets Oberth built with Ufa money failed), there is one aspect in which Lang’s fiction film inspired reality: introducing the backwards countdown to launch.<sup>207</sup> This addition was Lang’s, a choice made for the purpose of building suspense. As Bernd Brunner writes, “the film transcended its medium,

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<sup>205</sup> Ibid, 18.

<sup>206</sup> Kirby, "The Future Is Now: Diegetic Prototypes and the Role of Popular Films in Generating Real-World Technological Development."

<sup>207</sup> Marc Mancini, "The Future Isn't What It Used to Be," *Film Comment* 21, no. 3 (1985), 12; Bernd Brunner, *Moon: A Brief History* (New Haven: Yale University Press, 2010), 212.

popularizing the idea of rocket science, an effect that cannot be underestimated.”<sup>208</sup> The film was banned in Germany after the Nazi party came to power, as it was perceived to be a security threat to their rocket development program.<sup>209</sup>

That said, the perceived verisimilitude of Lang’s film did vary greatly. Distributed in the United States under the title *By Rocket to the Moon*, a review published in the April 1931 issue of *Movie Makers* referred to the film as “fanciful” to the degree that “since the whole idea is in the realm of fancy, there is no possible criticism arising from comparisons with actuality.”<sup>210</sup> Meanwhile, the review published in *Photoplay* that same month called the film scientific and dull, lamenting a lack of romance.<sup>211</sup> The brief review of the film listed in subsequent issues summarizes their verdict on the film as “the Germans present an interesting lesson in astronomy, if you like astronomy.”<sup>212</sup>

The *Photoplay* review reads something like a slight, but films like *Woman in the Moon* did help foster interest in space exploration. While the pioneering generation of rocket scientists were inspired by science fiction literature, the influence of science fiction film came into play by the second generation. As Walter McDougall writes, “Oberth’s work on Fritz Lang’s silent film classic, *Frau im Mond* (19[29]) and his 1929 book *Wege zur Raumschiffahrt* (Paths to Space Travel) helped to encourage young Germans to vault the engineering hurdles on the road to fulfillment of the dream.”<sup>213</sup> While these texts and films inspired individuals, a key turning point came when these dreams of space exploration began to unite these individuals together in so-called rocket societies that began to spring up across the Western world throughout the 1920s

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<sup>208</sup> *Moon: A Brief History*, 213.

<sup>209</sup> *Ibid.*

<sup>210</sup> Anonymous, "Critical Focusing," *Movie Makers*, April 1931.

<sup>211</sup> "The Shadow Stage: A Review of the New Pictures," *Photoplay*, April 1931, 134.

<sup>212</sup> "Brief Reviews of Current Pictures," *Photoplay*, May 1931, 10.

<sup>213</sup> Walter A. McDougall, *The Heavens and the Earth: A Political History of the Space Age* (Baltimore: Johns Hopkins University Press, 1997), 26.



and '30s, including the German Verein für Raumschiffahrt (VfR) in 1927 and the American Interplanetary Society (later known as the American Rocket Society, ARS) in 1930. These rocket societies differed from earlier space-related organizations in their central commitment to the achievement of human space flight.<sup>214</sup> Oberth's *Paths to Space Travel* served as a constitutional document for the highly influential VfR, with the author himself serving as the organization's first president; Oberth soon found a protégé in a young Wernher von Braun, also a member. Over in Great Britain, Arthur C. Clarke, who would go on to write the screenplay of *2001: A Space Odyssey*, was also involved in a rocket society.<sup>215</sup>

It was work placed firmly in the realm of science *fiction* that first inspired these rocket societies and brought founding members together, but once established they also often took pioneering real-world steps in practicalities of rocketry. By 1932, VfR had conducted 87 flights and made breakthroughs in the mechanics of liquid-fuel propulsion and regenerative cooling techniques. Many VfR members went to work for the German army, where they developed the V-2, the world's first large liquid-fuel launch vehicle. Following WWII, 125 members of this team would emigrate to the United States, where many of them ultimately helped bring the first Americans to the moon.<sup>216</sup>

The more fantastical endeavors of rocket societies and their members were not without consequence either. Beyond inspiring young people who would later go on to pursue aerospace careers, as briefly addressed earlier, cinematic depictions of future technologies can serve as what Kirby calls “diegetic prototypes,” “virtual witnessing[s]” of future technology within a film that “entail an additional visual and narrative rhetoric specifically framed so as to encourage

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<sup>214</sup> McCurdy, *Space and the American Imagination*, 22-33.

<sup>215</sup> *Ibid*, 24.

<sup>216</sup> *Ibid*, 24-26.

audience support for the development of the technology seen on screen” and also, in doing so, “contextualize emergent technologies within the social sphere.”<sup>217</sup> Through serving as technical consultants, science fiction films gave the likes of Hermann Oberth and Wernher von Braun, who consulted on the 1950 film *Destination Moon*, an opportunity to present their ideas and their versions of what a human future in space would look like to a mass audience, and helped those visions gain traction in the public imagination.<sup>218</sup>

*Destination Moon* makes a particularly compelling example. While manned space travel was already popular in all sorts of fiction, the impression seeing such a “realistic” lunar landing had on audiences was, at least in some cases, quite profound. As Wyn Wachhorst, who saw the film as a boy during its original theatrical run, recalled, “When that long silver ship set down on the surface of the moon and the crew descended in utter silence, it was as though the irrelevancies dimmed and essentials came clear. Viewing the first realistic depiction of a visit to another world (also the first in color) had an effect similar to the televised landing of Apollo 11, or to the dazzling NASA footage projected onto the five-story Imax screen in *Blue Planet* (1990).”<sup>219</sup>

The film can also be regarded as a precursor to Walt Disney’s three-part *Man in Space* television series, which has been widely regarded as playing a key role in convincing the general public of the feasibility of putting humans on the moon. As McCurdy writes, “To millions of Americans it portrayed human space flight as something real, as no longer related to the realm of fantasy.”<sup>220</sup> However, few commentators have noted how the educational cartoon echoes a scene

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<sup>217</sup> Kirby, “The Future Is Now: Diegetic Prototypes and the Role of Popular Films in Generating Real-World Technological Development,” 44.

<sup>218</sup> Irving Pichel, “Destination Moon,” (Eagle-Lion Classics Inc., 1950); McCurdy, *Space and the American Imagination*.

<sup>219</sup> Wyn Wachhorst, “The Dream of Spaceflight: Nostalgia for a Bygone Future,” *The Massachusetts Review* 36, no. 1 (1995).

<sup>220</sup> McCurdy, *Space and the American Imagination*, 48-49.

from a film released five years prior—*Destination Moon*—in which a team of scientists and engineers set on going to the moon convinces their prospective financiers with a Woody Woodpecker cartoon about the mechanics of manned space flight.<sup>221</sup> Considering how the real moon landing was ultimately funded publicly instead of privately, the parallels between the *Destination Moon* team using a familiar animated character to convince their roomful of investors and arguably the most iconic name in the animation business broadcasting a PSA for manned spaceflight to every household with a television set become all the more apparent.

The Woody Woodpecker skit from *Destination Moon* arguably set a much stronger precedent for Disney's "Man in Space" miniseries than anything that had been on television. While space would become a major news story after the *Sputnik* launches in 1957 and the creation of NASA in 1958, the predominant space-oriented presence in American television in the first half of that decade were space operas targeted for young audiences such as *Space Patrol* and *Tom Corbett, Space Cadet* (both 1950-55). There was one non-fiction science program, *The Johns Hopkins Science Review*, but it tackled the scientific concerns of the day in a dense lecture format that lacked mass appeal.<sup>222</sup>

In the introduction of *Space in the American Imagination*, Howard McCurdy writes that "The most pervasive images enlarge the ideas, customs, and beliefs held by the public at large—what is generally known as popular culture. Persistent ideas become part of the popular culture. They become part of the stories that communities of people tell about themselves, stories that help define who they are and the things in which they believe."<sup>223</sup> Beyond the potential influence of the speculative images of mankind's future in space on the development of actual working

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<sup>221</sup> Pichel, "Destination Moon."

<sup>222</sup> J. P. Telotte, "Animating Space: Disney, Science, and Empowerment," *Science Fiction Studies* 35, no. 1 (2008), 48.

<sup>223</sup> McCurdy, *Space and the American Imagination*, 3.

technology, the rhetoric and rationale behind space exploration as first developed in science fiction in the first half of the 20<sup>th</sup> century became central in the push for both the foundation of NASA and then the support and funding of NASA.

From film to television to the Disneyland theme park, rockets and space travel exploded into popular culture in the 1950s, fueled by the interests of major players in entertainment including Walt Disney and George Pal, as well as the efforts of “space boosters” like Robert A. Heinlein and aerospace engineer Wernher von Braun who put considerable stock in fostering public enthusiasm to boost political support for space science. Some of these science popularizers would go on to be involved in NASA, but even those who did not helped foster an image of humankind’s future in space—and why we should go there—that has a lasting legacy to this day.<sup>224</sup>

NASA officially got its start in 1958 with the National Aeronautics and Space Act, a year after the U.S.S.R. launched the *Sputnik* as part of the International Geophysical Year (IGY), an international effort which sought to bring together scientists worldwide for intensive and comprehensive studies of the planet and nearby space.<sup>225</sup> IGY planning began in 1952, and ultimately included an alliance of scientific teams from 67 nations.<sup>226</sup>

Following the October 1957 launch of *Sputnik I*, the U.S.S.R. achieved several other “firsts” in space. Within a month *Sputnik II* launched the first living creature, the dog Laika, into space. In January 1958 *Luna I* became the first man-made object to orbit the sun. *Luna II*,

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<sup>224</sup> Ibid.

<sup>225</sup> Iina Kohonen, "The Space Race and Soviet Utopian Thinking," in *Space Travel & Culture: From Apollo to Space Tourism*, ed. David Bell and Martin Parker (Malden: Blackwell, 2009).

<sup>226</sup> W. D. Kay, *Defining NASA: The Historical Debate over the Agency's Mission* (New York: State University of New York Press, 2005), 35-37.

carrying the Soviet flag, hit the surface of the moon that September. A little over a year later, in October 1959, *Luna III* orbited the moon and sent back the first images of the moon's far side.<sup>227</sup>

Where the U.S.S.R. celebrated, it would be perhaps more fitting to say that the U.S. *suffered* through several "space" firsts around this time, including the televised explosion of the *Vanguard* satellite during a December 6, 1957 test launch. It was, ironically, von Braun and his team that finally got the first U.S. satellite into space in January 1958, although the victory was especially tepid as *Explorer I* was technologically underwhelming in comparison to the Soviet developments.<sup>228</sup>

Eisenhower vehemently denied the existence of a "space race" between the US and the USSR and continued to insist on the superiority of American scientific and technological advancements even as public concerns skyrocketed following the *Sputnik*. The launch had not been a particularly secret endeavor. There had been several indications in the Soviet press, however, these were largely ignored by the Western media, and as such, the *Sputnik* was greeted by the U.S. public with no small degree of shock.<sup>229</sup>

The staunch belief in American technological superiority that prevailed since the development of the atomic bomb was suddenly shattered. The *Sputnik* launch also marked a new, heightened stage of the Cold War as the USSR provided irrefutable evidence that they had a rocket powerful enough to cross the Atlantic, meaning the US was theoretically vulnerable to a direct military attack. Not only was the threat of the USSR greater than ever, but officials ranging from congressmen to Eisenhower himself spoke around this time of the Cold War being a new, all-encompassing sort of conflict, one fought on every front save a battlefield.<sup>230</sup>

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<sup>227</sup> Ibid, 42.

<sup>228</sup> Ibid, 37, 49.

<sup>229</sup> Kohonen, "The Space Race and Soviet Utopian Thinking," 115.

<sup>230</sup> Kay, *Defining NASA: The Historical Debate over the Agency's Mission*.

The “Soviet threat,” Eisenhower said in his 1958 State of the Union, was singular “in its all-inclusiveness. Every area of human activity is pressed into service as a weapon of expansion. Trade, economic development, military power, arts, science, education, the whole world of ideas—all are harnessed to this same chariot of expansion.”<sup>231</sup> Everything from a chess match (Bobby Fisher defeating Boris Spassky in 1971) to a hockey game (the U.S. beating the U.S.S.R at the 1980 Winter Olympics in the midst of the Iranian hostage crisis) could be seen as a battle in an all-encompassing war. In this way, many efforts took on far heftier meaning and greater urgency than they might have otherwise. NASA was brought to fruition in 1958 not merely as a scientific endeavor or a matter of prestige, but of national security. Although official remarks and documents leading up to and in the early days of NASA prominently feature scientific interests and “the compelling urge of man to explore and discover” among the factors motivating the creation of the organization, concerns regarding Soviet progress in space exploration are the bottom line underscoring the vast majority of the rhetoric.<sup>232</sup>

While NASA got its start under President Eisenhower, his view of what a space program should be differed considerably from romantic frontier notions. He had little interest in manned missions, and refused to approve any manned space flight beyond the single-seat Mercury capsule. He considered the goal of a civilian space program to be more geared towards the scientific discoveries possible through satellite technologies and other unmanned programs than seeking engineering prestige and racing the USSR to put a man on the moon, referring to it as “a mad effort to win a stunt race,” and shortly before he left office his Science Advisory Committee dismissed the push for human space flight as motivated by “emotional compulsions.”<sup>233</sup>

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<sup>231</sup> Dwight D. Eisenhower quoted in *ibid*, 46.

<sup>232</sup> *Introduction to Outer Space* quoted in *ibid*, 58.

<sup>233</sup> Dwight D. Eisenhower, “Interview with Dwight D. Eisenhower.” *Saturday Evening Post* (August 6), 24; President’s Science Advisory committee, “Report of Ad Hoc Panel on Man-in-Space.” (14 November 1960), 5.

However, the prevailing endorsement of the space-frontier concept throughout popular culture and space explorations advocates widely undermined Eisenhower, and made it particularly easy for his successor John F. Kennedy to take NASA in a different direction. As McCurdy writes, “fiction and the imagination played no small part in building official support for Kennedy’s bolder approach.”<sup>234</sup> Roger D. Launius similarly comments, “The 1961 decision by President John F. Kennedy to send an American to the moon by the end of the decade [...] may have been readily accepted by everyone from the most jaded politician to the most romantic poet because it was the Moon.”<sup>235</sup>

Though the urgency and anxieties aggravated by the *Sputnik* were still in full swing, the idea of putting an American man on the moon brought back an upbeat, triumphant edge largely lacking from the space exploration rhetoric seen in the late 1950s. While referencing *Sputnik* and positing the lunar landing as playing a role in “the battle that is going on around the world between freedom and tyranny,” President Kennedy’s May 25, 1961 address to Congress returns to a language of achievement and dominance as opposed to the more pessimistic racing metaphors seen frequently in the post-*Sputnik* 1950s, which instead give a sense of just trying to keep up.<sup>236</sup>

Not only was outer space well-constructed as the final frontier in the American imagination well before *Star Trek* or John F. Kennedy referred to it in such terms, but looking to cinema, the pre-history and early phase of American space exploration—from the time Chuck Yeager first broke the sound barrier in 1947 to the flight of the last Mercury spacecraft, *Faith 7*,

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<sup>234</sup> Howard E. McCurdy, “Fiction and Imagination: How They Affect Public Administration ” *Public Administration Review* 55, no. 6 (1995), 501.

<sup>235</sup> Roger D. Launius, “Why Go to the Moon? The Many Faces of Lunar Policy,” *Acta Astronautica* 70 (2012), 166.

<sup>236</sup> John F. Kennedy quoted in *ibid.*, 166.

in 1963—lines up with the so-called “golden age” of movie Westerns, “that extended moment when the genre was most clearly associated with the themes of national identity.”<sup>237</sup>

The lasting space frontier analogy was not the only key argument utilized in the development of the American space program that had its roots in science fiction. Throughout the Cold War, the concept of the military importance of space was crucial in validating the huge budget bestowed upon the space program throughout the 1960s. Hollywood films played a role in presenting this argument to the general public through a number of popular and hugely influential science fiction films. In *Destination Moon* (1950), for example, a military general uses the following argument to convince wealthy investors to finance a private lunar mission by saying “the race is on and we better win it.”<sup>238</sup> Through science fiction vehicles including film, the vision of what humanity’s future in space would look like and the rhetoric that would be used to sway both politicians and the public to pursue said future were all well-established prior to NASA’s inception.

### **The Space Frontier After *Apollo 11***

In 1995, Johnson Space Center engineer Norman Chaffee commented, “I think NASA is a problem-solving organization... and if NASA doesn’t have a real problem to work on, NASA will make up a problem to work on, and that’s just part of the culture.”<sup>239</sup> The *Apollo 11* moon landing marked both a major victory for NASA and a worrisome turning point. When Neil Armstrong and Buzz Aldrin stepped on the moon and planted an American flag, the “space race” was won, and President Kennedy’s promise to put an American man on the moon before 1970

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<sup>237</sup> James Scott, "The Right Stuff at the Wrong Time: The Space of Nostalgia in the Conservative Ascendancy," *Film & History* 40, no. 1 (2010).

<sup>238</sup> Pichel, "Destination Moon."

<sup>239</sup> Qtd. in Brian Woods, "A Political History of Nasa’s Space Shuttle: The Development Years, 1972-1982," in *Space Travel and Culture: From Apollo to Space Tourism*, ed. Martin Parker and David Bell (Malden: Blackwell, 2009).



fulfilled. However, in completing their mission, NASA's greatest triumph also incited an existential crisis for the organization.

As McCurdy writes, "fiction can influence the choice of public policies and the methods for carrying them out, especially in areas where experts cannot agree."<sup>240</sup> In deciding what to push for next, two connected visions came to the forefront: a permanent space station and a space shuttle program to service it. This concept of a permanent human outpost in space aligns well with the space-as-frontier mythology and the process by which earth frontiers from the American West to the global poles have been treated after their initial discovery. Much like with the lunar mission, the blueprint came from science fiction, found everywhere from *2001: A Space Odyssey* to the Disneyland Space Station X-1 exhibit that opened in 1955, with a promotional publication claiming that "in the future, according to scientists, space stations similar to the one at Disneyland will have full living quarters for several score of men and its own gravitational field."<sup>241</sup> However, not all fantasies are equally suited to becoming reality. The grand space station serviced by a frequent, cost-effective shuttle program fit the romantic image of the human future in the space-frontier but proved entirely unsuited to the realities of space travel.

Some commentators have gone as far as to call the shuttle program an "unmitigated failure," even outside of the *Challenger* and *Columbia* disasters. Adam Keiper traces back the "fundamentally flawed" design of space shuttles to the fundamental problem that "the shuttle is a bastardized version of a concept that doesn't completely make sense," inspired by a dream of space colonization popularized by science fiction and science boosters ranging from Wernher von Braun to *2001: A Space Odyssey* as opposed to being a course of action suggested by any

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<sup>240</sup> McCurdy, "Fiction and Imagination: How They Affect Public Administration," 500.

<sup>241</sup> "Tomorrowland Built with Aid of Experts," *Disneyland News*, September 1955, 6.

scientific understanding of space or rocket engineering reality.<sup>242</sup> Homer Hickam, whose memoir *Rocket Boys* provided the basis for the film *October Sky*, compared the space shuttle program to “NASA’s Vietnam,” adding that “a generation of engineers and managers have exhausted themselves trying to make it work and they just can’t.”<sup>243</sup>

The complex relationship between science fiction and reality when it comes to space exploration is evident in looking at NASA’s space shuttle program. After much debate and considerable criticisms over necessity and priority, NASA finally produced its first shuttle in 1976. Originally dubbed the *Constitution*, an extensive write-in campaign to the White House by *Star Trek* fans culminated in President Gerald Ford informing NASA Administrator James Fletcher that he supported changing the name to *Enterprise* in a on September 8, 1976 meeting.<sup>244</sup>

Despite some initial concern within NASA, the public unveiling of the shuttle on September 17 leaned heavily into the association with the fictional franchise, with six cast members from the television series in attendance as the *Enterprise* emerged from its hanger to the tune of the *Star Trek* theme played by the Golden West Air Force Band. Ultimately, as Brian Woods writes, “The mythology of an American-led multinational corps of missionaries spreading peace by enterprise suited the post-lunar propaganda and served to justify the continuing exploitation of space.”<sup>245</sup> NASA’s official relationship with *Star Trek* might have begun with the successful *Enterprise* campaign, but it certainly has not ended there. Even the Smithsonian National Air and Space Museum has prominently featured *Star Trek* in its record of the history of US space flight.

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<sup>242</sup> Adam Keiper, "A New Vision for NASA," *The New Atlantis* 3 (2003), 7.

<sup>243</sup> Homer Hickam qtd. in *ibid*, 8.

<sup>244</sup> Constance Penley, *NASA/Trek: Popular Science and Sex in America* (New York: Verso, 1997).

<sup>245</sup> Woods, "A Political History of NASA’s Space Shuttle: The Development Years, 1972-1982."

## **The Post-*Challenger* Relationship Between NASA and Cinema**

NASA's worst public relations disaster to date occurred on the morning of January 28, 1986, when the Space Shuttle *Challenger* broke apart 73 seconds after take-off, resulting in the death of all crew members, including school teacher Christina McAuliffe. Viewed by school children across the U.S. in all schools in possession of a television set, the *Challenger* launch became a traumatic event for a generation of American children. As Constance Penley writes, with the *Challenger* disaster "NASA's attempt to make the space program popular with young people all across America literally blew up in its face."<sup>246</sup>

And yet, less than a decade later, NASA's public image was on a major upswing as the Apollo program hit milestone anniversaries and Ron Howard's *Apollo 13* took the box office by storm. "Even with NASA's myriad known failings—not to mention the ones it covers up—the space agency continues to represent, however improbably, creativity, cooperation, and perseverance. NASA's polysemous meanings can still be mobilized to rejuvenate the near-moribund idea of an ideal future toward which dedicated people could work," writes Constance Penley before going on to identify "the film industry's summer blockbuster approach" as one of the ways in which NASA keeps the bright side of its image alive.<sup>247</sup>

By the 1990s, the concept of humans on the moon was far enough removed to have regained some degree of mystery while having earned some degree of rose-tinted nostalgia with age, especially after the 25<sup>th</sup> anniversary of *Apollo 11* took place in 1994 with considerable fanfare. The following year, filmmaker Ron Howard brought a romantic vision of NASA to the

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<sup>246</sup> Penley, *NASA/Trek: Popular Science and Sex in America*, 41.

<sup>247</sup> *Ibid.*, 11-12.

big screen in *Apollo 13*, a Tom Hanks-starring based-on-a-true-story that “recreates an era when NASA appeared faultless and heroic.”<sup>248</sup>

Thus far, five films have been released that may be called “NASA history docudramas”: *The Right Stuff* (1983), *Apollo 13* (1995), *October Sky* (1999), *Hidden Figures* (2016), and *First Man* (2018). While both NASA as an organization and individuals within NASA have gotten significantly involved with scores of films over the years (not to mention upwards of a hundred documentary films per annum), it is worth addressing this particular collection of films independently due to their unique relationship to the public image and reputation of NASA.

The astronaut’s status as a revered 20<sup>th</sup> century icon owes as much to popular culture as it does to history. As Dario Llinares writes, “Innumerable media representations have contributed to an intertextual mythology which constructs the astronaut as an ideal embodiment of American identity.”<sup>249</sup> Beginning in the 1950s, the astronaut was an archetypal film protagonist of a kind with cowboys and war heroes. However, while individual astronaut “heroes” were largely generated by the news media throughout the course of the Apollo program, after manned spaceflight waned in the public eye, it became fictional media that began to generate key space-travelling icons as well as preserve the status of real historical figures through such major Hollywood films such as *Apollo 13* and *Hidden Figures*.

From the days of Hermann Oberth to the present, fictional media has been the most powerful tool available to generate youth interest in both the general field of space science and specific space science organizations. As generating early interest in space exploration is of considerable importance to ensuring an organization’s future, connecting with youth audiences is

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<sup>248</sup> Ibid.

<sup>249</sup> Dario Llinares, “Idealized Heroes of ‘Retrotopia’: History, Identity and the Postmodern in *Apollo 13*,” in *Space Travel & Culture: From Apollo to Space Tourism*, ed. David Bell and Martin Parker (Malden: Blackwell, 2009).

of considerable significance to such as NASA. As Albert A. Harrison writes, “Only if we can capture our children's interests can we assure continued progress into space.”<sup>250</sup>

As shall be addressed in more detail later, docudramas—fictional film interpretations of historical events—have been demonstrated to significantly influence viewers’ conceptions of the events depicted, and therefore of any films, the five NASA history dramas are of special note because they have a particular ability to shape public attitudes towards and perceptions of the organization and its history, and in this and other ways have arguably already made a non-negligible impact on the organizations future (an argument that will, once again, be further developed shortly). In the sense of fostering youth interest in space exploration and space science, the PR mission of the ill-fated *Challenger* has since been most successfully achieved through Hollywood intervention. School children across the country were gathered around television screens on January 28, 1986 with the goal of fostering interest in NASA, and instead watched a disaster unfold in nearly real-time, an experience that ultimately destroyed far more youth interest and enthusiasm for NASA’s activities than it created. However, in decades since, televisions have been wheeled into classrooms with similar goals and students have been shown popular space programs such as the 1980 PBS *Cosmos* series presented by Carl Sagan or even quite frequently movie docudramas of the history of space travel.<sup>251</sup>

The five theatrically released NASA docudramas are quite remarkable in the uniformity of their relative critical acclaim. On Rotten Tomatoes, only *First Man* has less than a 90% “Fresh” rating from critics, and even then, only just, with 87%.<sup>252</sup> *Apollo 13*, *October Sky*, and

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<sup>250</sup> Albert A. Harrison, *Spacefaring: The Human Dimension* (Berkeley: University of California Press, 2001), 266.

<sup>251</sup> Penley, *NASA/Trek: Popular Science and Sex in America*; ““Shadow of Terror” with Richard Fraser and Grac Gillern.”; James G. Goll, Lindsay J. Wilkinson, and Dolores M. Snell, “Teaching Chemistry Using *October Sky*,” *Journal of Chemical Education* 86, no. 2 (2009).

<sup>252</sup> “First Man: Tomatometer,” Fandango, [https://www.rottentomatoes.com/m/first\\_man](https://www.rottentomatoes.com/m/first_man).

*Hidden Figures* were all successful at the box office. *October Sky* was a moderate sleeper hit. *Apollo 13* proved to be the third highest grossing film of 1995 at the U.S. Box Office, beaten only by *Toy Story* and *Batman Forever*, while *Hidden Figures* was the 14<sup>th</sup> highest grossing film of 2016—the highest-ranking non-sequel live action film of that year.<sup>253</sup> The financial success of both was met with considerable surprise. On the other hand, *The Right Stuff* and *First Man* both underperformed in theaters relative to expectations, with *The Right Stuff* failing to earn back its production costs in spite of widespread critical acclaim.

Intriguingly, there is a notable feature that differs between these two groups: patriotism, or lack thereof. While all five films cover the Cold War era—albeit *Apollo 13* catches the tail end, after the “space race” was won with the success of Apollo 11—only *Apollo 13*, *October Sky*, and *Hidden Figures* fully embrace the earnest apple pie Americana, American-space-frontier brand of ideology that define NASA’s curated Apollo program “golden age” image. Collectively, these films have shaped and reshaped cultural memory of NASA and played a key role in keeping NASA firmly planted in the public imagination.

### ***The Right Stuff* (1983)<sup>254</sup>**

Considering its instant success, film producers took interest in Tom Wolfe’s book *The Right Stuff* the moment it hit shelves in 1979. However, the general consensus quickly became that the book really had two films in it—the story of Air Force test pilots starring Chuck Yeager and the tale of the Mercury Seven astronauts (Scott Carpenter, Gordon Cooper, John Glenn, Gus Grissom, Wally Schirra, Alan Shepard, and Deke Slayton)—and that one would have to be chosen over the other. While the lauded screenwriter William Goldman drafted a screenplay

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<sup>253</sup> "1995 Domestic Grosses," IMDb, <https://www.boxofficemojo.com/yearly/chart/?yr=1995&p=.htm>.; "2016 Domestic Grosses," IMDb, <https://www.boxofficemojo.com/yearly/chart/?yr=2016>.

<sup>254</sup> Philip Kaufman, "The Right Stuff," (Warner Bros., 1983).

which left Yeager on the cutting room floor, director Philip Kaufmann came in and insisted on Yeager's inclusion, and ultimately ended up writing his own screenplay that kept both stories in play, resulting in a film with an epic 3-hour runtime that doesn't so much mention Sputnik or the space race until well past the 40-minute mark.<sup>255</sup>

The media regularly framed the film's 1983 release in the context of former Mercury 7 astronaut John Glenn's bid for the Democratic nomination in the presidential election the following year, with *Newsweek* running a cover story entitled "Can a Movie Help Make a President?" Significantly, the magazine cover featured an image of actor Ed Harris in costume as Glenn, not Glenn himself.<sup>256</sup>

However, the film itself idolizes Chuck Yeager above all, an aspect of the film which has received a considerable critical attention.<sup>257</sup> While the astronauts have "the right stuff"—a commendable, if somewhat foolish, bravery—they are ultimately still depicted as glorified "monkeys" and "spam in a can," their all-American hometown hero images a press-generated fairytale with minimal basis in reality with the exception of self-described "Dudley Do-Right" John Glenn, an admirably wholesome family man with negligible cool factor. Overall, the film ultimately admires and ridicules the astronauts in equal measure, never missing an opportunity to poke fun at them, from embarrassing medical tests to Gus Grissom flailing gracelessly in the water after the *Liberty Bell 7*'s hatch malfunctioned after landing in the Atlantic Ocean. In comparison, Chuck Yeager personifies masculine cool, a throwback to 1960s rebel-heroes complete with leather jacket. Where Grissom gets fished out of the water as helpless as a trout,

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<sup>255</sup> Anthony Reveaux, "The Right Stuff," *American Cinematographer* November 1983.

<sup>256</sup> William C. Adams et al., "The Power of *the Right Stuff*: A Quasi-Experimental Field Test of the Docudrama Hypothesis," *The Public Opinion Quarterly* 49, no. 3 (1985), 330.

<sup>257</sup> Tom Carson, "The Wrong Stuff: Hero Worship in Late-Capitalist Hollywood," *The Baffler* 35 (2017).

Yeager emerges from the smoke and fire of a plane crash badly burned but still cool as a cucumber with all the swagger of James Dean.<sup>258</sup>

The Mercury 7 are depicted as brave, if over-hyped, guinea pigs. Meanwhile, NASA's scientists are more or less the standard inept egghead types and the press a swarm of locusts played by an actual physical comedy troupe. Both are hapless and no individual members are depicted as possessing any endearing qualities, although each group is ultimately depicted as serving a necessary purpose. On the opposite end of the spectrum from Chuck Yeager is the political establishment, which the film regards as a veritable slapstick routine of never-ending ineptitude. Any time a politician appears in a scene, it is a given that he will make a fool of himself at least once.

While the film depicts the astronauts as possessing at least a few admirable qualities, it subverts the popular image of the space race as a majestic endeavor and an American triumph. "Launched with a whole Alpha Centauri 's worth of hype" and gaining widespread critical acclaim, *The Right Stuff*'s failure at the box office was seen as quite unexpected.<sup>259</sup> Tom Carson cites *The Right Stuff*'s lack of starry-eyed hero worship in its depiction of the Mercury 7 astronauts and the space program as playing a role in the film's underwhelming box office performance: "Anyone expecting to see Glenn and his silver-suited coevals lionized as heroes or pining for a celebration of the space program as a gigantic national achievement got treated instead to an ambivalently derisive look at the whole shebang as a cavalcade of PR stunts, political posturing, and manufactured goals." The typical American moviegoer, he says, "wanted *The Right Stuff* to hail a famous victory, not denigrate it as a public-relations boondoggle," going on to elaborate that that's exactly what Hollywood has delivered when covering NASA's history

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<sup>258</sup> Kaufman, "The Right Stuff." DVD.

<sup>259</sup> Carson, "The Wrong Stuff: Hero Worship in Late-Capitalist Hollywood," 136.



since in movies like *Apollo 13* and *Hidden Figures*.<sup>260</sup> However, the ultimate indication that Carson's hypothesis holds water is that *First Man* (2018), which fails to glorify the space race and the Apollo astronauts much in the way *The Right Stuff* does the Mercury 7, similarly underperformed at the box office. (The similarities between the two films will be further analyzed later).

Even though the astronauts were not lionized in *The Right Stuff*, a study found that viewing the film seemed to positively influence audience's opinion of John Glenn even though he was depicted as admirable but bland. Williams C. Adams and colleagues carried out a "field test" of the "docudrama hypothesis"—the concept that fictionalized cinematic interpretations of real events can produce a marked influence on viewers' "conceptions of social and political reality"—in the context of the release of *The Right Stuff* and John Glenn's (ultimately unsuccessful) bid for the Democratic nomination in the 1984 presidential election.<sup>261</sup> By interviewing voting age moviegoers of both sexes and both Democratic and Republican political affiliations in two states and Washington, D.C. before, directly after, and a month after viewing *The Right Stuff* in theaters, they found that the film had a positive impact on viewers' perception of Glenn as both an individual and a politician in a statistically significant manner. In both categories, ratings of Glenn rose nearly 10% between the pre-film and immediate post-film groups, and post-movie endorsement of Glenn as a presidential candidate (answering the question "Who do you prefer as the Democratic nominee for president?" with Glenn's name) rose 7%. In the words of the authors, "the magnitude of that effect was not trivial—especially where presidential politics is concerned."<sup>262</sup> Furthermore, the delayed post-film responses

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<sup>260</sup> Ibid, 136.

<sup>261</sup> Adams et al., "The Power of *the Right Stuff*: A Quasi-Experimental Field Test of the Docudrama Hypothesis," 330.

<sup>262</sup> Ibid, 334.

indicated that these were long-term impacts. While I have not encountered similar tests involving the figures at the center of the far more glowing portrayals of *Apollo 13* and *Hidden Figures*, one would imagine the effects could potentially be even more marked.

While *The Right Stuff* has not directly reached audiences as widely as *Apollo 13* or *Hidden Figures*, its critical regard and legacy in cinematic circles are such that its indirect influence can be seen in later NASA docudramas, such as depicting the worried astronauts' wives back home and their struggles within the domestic sphere as a counterpart to their husbands' outer space escapades.

### *Apollo 13* (1995)<sup>263</sup>

While technically a failure, the safe return of the three members of the *Apollo 13* mission on April 17, 1970 from an aborted lunar mission has come to be remembered as “one of *the* shining moments of the Apollo program, and a defining event of the entire era.”<sup>264</sup> While media coverage of the astronauts' fraught journey home had already depicted the trio in a heroic light, much credit for how the incident continues to remain so prominent in the public imagination and remain as lionized as it is has been given to the enduring popularity of the Hollywood blockbuster *Apollo 13*, directed by Ron Howard and starring lifelong NASA enthusiast Tom Hanks as mission leader Jim Lovell.

*Apollo 13* fed off the “Apollo nostalgia” already inflamed by the celebrations surrounding the 25<sup>th</sup> anniversary of the Apollo 11 moon landing the year before. Dario Llinares defines the film's rendering of 1970s America as an “ideological mythologizing” that presents a “utopia of the past”—a “retrotopia.” As he notes, “On one level *Apollo 13* depicts a perspective of history; a rendering which offers a way of viewing the past. Yet its tools of production effectively go

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<sup>263</sup> Ron Howard, “Apollo 13,” (Universal Pictures, 1995).

<sup>264</sup> Tom D. Crouch, “Review: ‘Apollo 13’,” *The Journal of American History* 84, no. 3 (1997), 1180.

beyond mere representation. Its absolute precision visually shapes a past which becomes the authentic reality of the event.”<sup>265</sup> For those generations born after the conclusion of the Apollo program, the definitive narrative of Apollo 13 became Ron Howard’s.

The real-world impact of the film on NASA’s public image and presence in public consciousness was immediately apparent. Within weeks of its release in theaters, NASA was receiving an average of 15 calls and 25 emails a day on the subject of *Apollo 13* while Houston’s Johnson Space Center reported a 20% increase in mail and calls. *The Chicago Tribune* reported that the surge in public interest “couldn’t have been timelier for NASA,” with an unspecified spokesman for the organization commenting that “the film has been very helpful.”<sup>266</sup> Less than two months after the film’s release, Tom Hanks went to Washington, D.C. and spoke on behalf of the space station to a crowd of over 100 lawmakers the day before a House vote to kill the program. Though Hanks claimed he was not there “to influence policy any more than your average American taxpayer would want to,” the House subsequently voted against defunding the space station by “the widest victory margin for the station in years.”<sup>267</sup>

So significant is the film’s impact that when in 1997 Congressional staff members planned hearings on “NASA’s Mission and America’s Vision for the Future of Space Exploration,” the four panelists selected were Apollo astronauts Edwin “Buzz” Aldrin and Walter Cunningham, Hubble Space Telescope repair mission commander Story Musgrave, and Ron Howard. Indeed, Howard’s directorial chops have been widely lauded and pointed to as playing a key role in the film’s enduring legacy. That said, twenty years later the director brought the same bag of tricks to a similarly “based on a true story” survival tale involving an ill-fated

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<sup>265</sup> Llinares, "Idealized Heroes of 'Retrotopia': History, Identity and the Postmodern in Apollo 13," 166.

<sup>266</sup> *The Chicago Tribune* quoted in Crouch, "Review: 'Apollo 13'," 1181.

<sup>267</sup> Richard Stone, "Tom Hanks: NASA’s Secret Weapon," *Science*, no. 269 (1995).

voyage with *In the Heart of the Sea* (2015), which tells the story of the ill-fated *Essex* whaling voyage in 1820 that inspired *Moby-Dick*, but neither critics nor audiences took to the film half as well. Involving several key members behind the scenes that worked with Howard on *Apollo 13*, including producer Brian Glazer and editor Mike Hill, and not lacking in star power with Chris Hemsworth at the helm, it seems possible that part of the difference in reception between the two films might be that the iconography of NASA and the Apollo era of manned lunar voyages strike a particular chord in the popular imagination.<sup>268</sup>

Much attention and applause has been given to *Apollo 13*'s overall attention to detail in depicting NASA protocol and the events of the *Apollo 13* mission. Charles Murray, who spent five years interacting with and shadowing members of the Apollo program with his wife, Catherine Cox, to write the [book] *Apollo*, reviewed the accuracy of *Apollo 13* for *The American Enterprise* magazine. While he took slight issue with a handful of "nitpicks," he ultimately concludes, "Hats off to Ron Howard, who pulled off something that no one else has done in the last quarter-century: getting large numbers of Americans to appreciate the splendor of the Apollo program, the one achievement of this century that we can be sure will still be part of the history books a thousand years from now."<sup>269</sup> While the ways in which the film defies the historical record might be regarded as "nitpicks," comparing the historical event and the 1995 film does highlight some intriguing omissions from the cinematic rendering, particularly when it comes *Apollo 13*'s mission.

Both within NASA and in media coverage of the *Apollo 13* prior to launch, the distinction made between the upcoming launch and the two earlier moon landings was an

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<sup>268</sup> Ron Howard, "In the Heart of the Sea," (Warner Bros., 2015).

<sup>269</sup> Charles Murray, "Hollywood Gets One Right – Apollo 13 Directed by Ron Howard," *The American Enterprise*, September 1995, 14.

emphasis on being a mission of scientific import. *Apollo 11* and *Apollo 12* demonstrated that American engineering funded by the American government could put a man on the moon, and that it was not a fluke. *Apollo 13*, in comparison, would be the “first scientific exploration” of the moon. The degree to which this was viewed as the would-be third moon landing’s defining characteristic is evident in the uniform patch designed for the mission, which read “ex luna Scientia” (“from the moon, knowledge”).<sup>270</sup>

However, in spite of both the whispers of discontent and fading interest in the Apollo program, and multiple opportunities presented by early scenes in which Lovell is questioned about the utility of continuing to fund the program and whether or not *Apollo 13* simply represented a “routine” flight by politicians and the press, *Apollo 13*’s scientific mission is never stated in the 1995 film. The closest it gets is an allusion when Lovell mentions something about sample collection prior to launch. As the incredible success of Ron Howard’s *Apollo 13* continues to ensure the mission will remain engrained in the public imagination, it is worth noting what the film ultimately did and did not deem worthy of inclusion in that remembrance.

### ***October Sky (1999)***<sup>271</sup>

Adapted from NASA engineer Homer Hickam’s memoir *Rocket Boys*, *October Sky* presents Hickam’s story as a coming-of-age tale. Inspired by the *Sputnik* launch, the high-school aged Hickam and some classmates experiment with building backyard rockets in the mining town of Coalwood, West Virginia in 1957, encouraged by a supportive science teacher, Miss Riley. After his father is injured in a mining accident, Hickam leaves school and starts working down in the mine. However, he eventually has a change of heart, returns to school, and enters a

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<sup>270</sup> Susan K. Opt, "American Frontier Myth and the Flight of Apollo 13: From News Event to Feature Film," *Film & History* 26, no. 1 (1996).

<sup>271</sup> Joe Johnston, "October Sky," (Universal Pictures, 1999).

rocket he designed into a nationwide competition, which he wins, receiving congratulations from his scientific inspiration, Wernher von Braun (Joe Digaetano). Closing titles reveal Hickam's future as a NASA engineer.

Reviews of the film indicate the degree to which it fits the feel-good, celebratory docudrama formula. *Sight and Sound* magazine commented that "rarely has a movie in recent years been as blatantly flag waving as *October Sky*," going on to compare the film to "Norman Rockwell's rosy vision of folksy Americana."<sup>272</sup> Janet Maslin's tepid review in *The New York Times* also drew comparison to Rockwell, calling it an "earnest, nostalgic film" full of "gung-ho wholesomeness."<sup>273</sup> Roger Ebert's three-and-a-half star review admires the film's "deep values."<sup>274</sup> Stephen Hunter of *The Washington Post* calls the film a "zircon[] of feel-goodism" so full of '50s nostalgia that it seems to have "stepped out of a bomb shelter."<sup>275</sup> Writing for CNN.com, Paul Clinton went as far as to say, "there is no doubt this film could have been made by the public relations office at NASA."<sup>276</sup>

Perhaps even more than the other films featured here, *October Sky* appears to be a particularly popular choice to show in science classes, perhaps because the teenage protagonists are presumably more relatable for youth audiences. A 2009 *Journal of Chemical Education* article even lays out a basic lesson plan for using *October Sky* to help teach chemistry.<sup>277</sup> Its popularity in the classroom is such that Homer Hickam felt the need to publish his thoughts on the film's use in schools, urging teachers to "proceed with caution" because of concerns that the

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<sup>272</sup> Kevin Maher, "'October Sky'," *Sight and Sound* January 2000. 60.

<sup>273</sup> Janet Maslin, "'October Sky': Eyes toward the Stars, True to His Dreams," *The New York Times*, February 19 1999.

<sup>274</sup> Roger Ebert, "Review of 'October Sky'," <https://www.rogerebert.com/reviews/october-sky-1999>.

<sup>275</sup> Stephen Hunter, "'October Sky,' Soaring to the Stars," *The Washington Post*, Feb 19 1999, C1.

<sup>276</sup> Paul Clinton, "'October Sky' Best Offering of a Still-Young Year," Cable News Network, <http://www.cnn.com/SHOWBIZ/Movies/9902/18/review.octobersky/>.

<sup>277</sup> Goll, Wilkinson, and Snell, "Teaching Chemistry Using *October Sky*."

film glossed over the long-term “serious study” of math and engineering put into successfully building a successful high-altitude rocket.<sup>278</sup> He concludes that he thinks *October Sky*, and popular films in general, are first and foremost useful (“can and should be used”) to “inspire students to pursue the study of science”—that the films should not be used by teachers “as an end to themselves,” but as a “springboard to a serious discussion of science and scientists.”<sup>279</sup>

### ***Hidden Figures (2016)***<sup>280</sup>

In telling a fictionalized account of the work of mathematicians Katherine Goble and Dorothy Vaughn and engineer Mary Jackson at the Langley Research Center at the height of Project Mercury, *Hidden Figures* tackles the subject of *The Right Stuff* with all the triumphant nostalgia and emphasis on American ingenuity of *Apollo 13*. Both nostalgic and revisionist, *Hidden Figures* manages to lionize NASA’s space race efforts while also addressing institutionalized racism and sexism, keeping aspects of *Apollo 13*’s “retrotopia” while remaining palatable to 2016 sensibilities by centering the story around three Black women actively pursuing STEM careers against the odds. As A. O. Scott writes in his *New York Times* review, the film “expands the schoolbook chronicle of the conquest of space beyond the usual heroes, restoring some of its idealism and grandeur in the process.”<sup>281</sup>

Released as the lack of diversity in on-screen representation reached new heights as a hot button issue in the film industry, *Hidden Figures* was nostalgic and yet imbued with a sense of contemporary relevance and importance. This somewhat contradictory state expresses itself in a

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<sup>278</sup> Homer H. Hickam Jr., "A Reflection on Rocket Boys/October Sky in the Science Classroom," *Journal of College Science Teaching* 29, no. 6 (2000), 400.

<sup>279</sup> Ibid.

<sup>280</sup> Theodore Melfi, "Hidden Figures," (20th Century Fox, 2016).

<sup>281</sup> A. O. Scott, "Review: 'Hidden Figures' Honors 3 Black Women Who Helped Nasa Soar," *New York Times*, December 22 2016.; Melfi, "Hidden Figures."

film that presents certain elements of the Black experience more adroitly than is typical of Hollywood while elsewhere falls into dated formulas that undermine the agency of its protagonists. One regard in which the film excels, for example, is its depiction of the friendship between the three leads and the way in which it demonstrates how such connections “served as a source of resilience and way of coping and resisting oppression” for Black women.<sup>282</sup> However, for all the areas in which the film goes against typical clichés, there are other areas in which the film fulfills classical Hollywood tropes at the expense of historical accuracy, such as when Gobel’s supervisor Al Harrison (Kevin Costner) is given a “white savior” moment in which he tears down the “whites only” sign hanging above the women’s bathroom on her behalf, or how the film significantly changes the timeline of Gobel’s relationship with Jim Johnson (Mahershala Ali) to give her a romantic subplot when in reality the two had married long before the events depicted in the film.

### ***First Man (2018)***<sup>283</sup>

In a certain regard, *First Man* gives the Apollo program the *The Right Stuff* treatment, in the sense that it refuses to follow the usual nostalgic glorious space race narrative or feed any notion of American exceptionalism, instead going to considerable lengths to view the *Apollo 11* mission instead as a universal “human” achievement.<sup>284</sup> This actually became a significant point of controversy before the film even made it to theatrical release after festival screening audience members reported that the film omitted the planting of the American flag on the lunar surface.

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<sup>282</sup> Miriam Lieway et al., "*Hidden Figures*: Calculated Responses to Sexism and Racism in 1960s America," *Journal of Family Theory & Review* 10, no. 3 (2017), 610.

<sup>283</sup> Damien Chazelle, "First Man," (Universal Pictures, 2018).

<sup>284</sup> Zack Sharf, "Ryan Gosling Addresses 'First Man' Critics Upset the Film Leaves out American Flag Being Planted on the Moon," *IndieWire*, 31 August 2018.; Dave McNary, "Neil Armstrong's Sons, Director Damien Chazelle Defend Absence of Flag-Planting Scene in 'First Man'," *Variety*, 31 August 2018.



President Donald Trump called the omission a “terrible thing” while Senator Marco Rubio referred to it as “total lunacy” in an irate tweet.<sup>285</sup> The pun appears to be unintentional.

*First Man* does, however, differ significantly from *The Right Stuff* in terms of tone, lacking Kaufman’s caustic comedy, or indeed, much in the way of humor at all. It’s a distinctly sober drama that puts considerable stock in not just being accurate in terms of effects and the technicalities of the *Apollo 11* launch, but characterization, with Ryan Gosling playing Neil Armstrong with a consistent stone-faced reticence. While there is considerable support for the historical accuracy of such a depiction, with Matthew Hersch describing the overall attitude of the Apollo astronauts as “sphinx-like and impenetrable even to their own families, rarely excited, seldom given to self-expression, and at times, distant.”<sup>286</sup>

Of the four NASA docudramas that feature astronauts, *First Man* is the only one to characterize astronauts in a way that reflects this remark. Ultimately, the film met a similar fate to *The Right Stuff*: critical success and a lackluster box office performance, further supporting Tom Carson’s claim that what the typical moviegoer wants in a NASA docudrama is a tale of laudable American ingenuity featuring lionized heroes.

### **Conclusion**

Throughout the history of space exploration, from the founding of the original rocket societies to the present, popular film has served as what David Kirby terms a “diegetic prototype” for space exploration, allowing scientists to share their visions of the future with a wide audience, and helping these visions gain traction towards becoming reality. Furthermore, through its regular use in Hollywood films—particularly those Hollywood docudramas like

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<sup>285</sup> Marina Koren, "The Absurdity of the 'First Man' Flag Controversy," *The Atlantic*, 12 October 2018.

<sup>286</sup> Matthew H. Hersch, "Return of the Lost Spaceman: America’s Astronauts in Popular Culture, 1959-2006," *The Journal of Popular Culture* 44, no. 1 (2011), 77.

*Apollo 13* that have now become *the* definitive accounts of major events in NASA history—the positive image of NASA presented in fiction film has become widely conflated in the popular imagination with the real organization and its history.

### Chapter Three

#### Heroic Renegades and “Strange Birds”: A History of Scientific Minds in American Biographical Film

While fictional portrayals of real historical figures date back to the silent era<sup>287</sup>, it was only with the introduction of sound that the biographical film<sup>288</sup> not only truly established itself as a genre, but as a genre with many of the connotations it still retains to this day. The introduction to a directory of “Stars, Players, and Directors” released by Warner Bros. in 1937 credits their string of George Arliss starring biopics starting with *Disraeli* with more or less single-handedly bringing legitimacy to the film industry:

And with George Arliss' entrance into the films, the Warners — possibly unwittingly — broadened the field of motion pictures. They proved that the flaxen-haired doll of the movies, and Ol' Devil Sex, was not the All Powerful in luring gold into the land of the jumping gelatines. Arliss was a smash hit. He won converts to the movies. People who had never darkened the bars on a box-office window came, and saw, and came again. The Warners and Arliss educated them and proved that movies could be GOOD. Could be dignified entertainment.<sup>289</sup>

Though other sources trace the biopic's “prestige picture,” legitimacy-bestowing reputation all the way back to 1912, when “Adolph Zukor presented Sarah Bernhardt as Queen Elizabeth as movie bait for middle-class audiences,”<sup>290</sup> the biopic generally came to prominence with the

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<sup>287</sup> Including: *The Execution of Mary Queen of Scots* (1895), *Queen Elizabeth* (1912), *Anne Boleyn* (1920)

<sup>288</sup> For the purposes of this essay, biopic/biographical film will follow the definition of a film depicting “the life, or the portion of a life, of a real person whose real name is used,” as stated in George F. Custen, *Bio/Pics: How Hollywood Constructed Public History* (Rutgers University Press, 1992), 6.

<sup>289</sup> *Silhouettes of Stars, Players, and Directors of Warner Bros. Pictures, Inc.*, (Warner Bros., 1937), 2-3. The introduction later re-emphasizes Warner's history of biographical films, making sure to mention on the next page that biopics “actually made money!”.

<sup>290</sup> Dennis Bingham, *Whose Lives Are They Anyway?: The Biopic as Contemporary Film Genre* (Rutgers University Press, 2010).

studio system that saw the genre as its ticket to the hearts of middle class audiences still concerned with the respectability of the movies.

Emphasizing the educational veneer worn by biopics—their “based on a true story”-ness—remains key to the way biopics are marketed and positioned, in spite of their fictionality. As such, though scholars may debate extent and degree, they generally agree that biopics have played a major role in “creating and sustaining public history,”<sup>291</sup> which is in turn a key component in the creation and maintenance of national identity, a “politically consequential fiction based on a selective remembering and forgetting.”<sup>292</sup> Though there are a handful of exceptions, as most scientists depicted in biopics do not have the sort of self-generated celebrity presence of the majority of other common biopic subjects—politicians, entertainers, artists, even particularly infamous criminals—the ability of biographical films to shape the public image of historical or, in some cases, contemporaneous scientific figures is especially profound.<sup>293</sup> As stated by Dennis Bingham, the biopic is an important film genre that “narrates, exhibits, and celebrates the life of a subject in order to demonstrate, investigate, or question his or her importance to the world; to illuminate the fine points of a personality; and for both artist and spectator to discover what it would be like to be this person, or to be a certain type of person”

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<sup>291</sup> Custen, *Bio/Pics: How Hollywood Constructed Public History*, 2.

<sup>292</sup> M. Lane Bruner quoted in William H. Epstein, “Biopics and American National Identity—Invented Lives, Imagined Communities,” *a/b: Auto/Biography Studies* 26, no. 1 (2011), 4.

<sup>293</sup> For the purposes of this chapter, “scientific figure,” “scientist,” and “scientific mind” all refer to individuals whose lifework included contributions to the fields that fall underneath the “STEM” umbrella—that is, science, technology, engineering, and math. In the biopic context, these individuals must be depicted as experts but need not hold any particular sort of degree if they gained this expertise through other means (e.g. Thomas Edison, Elizabeth Kenny). The work these individuals do must be in some way experimental (i.e. a medical doctor would only be included if he or she also pursues research). Doctors focused exclusively on non-experimental patient treatment as well as accredited individuals who are only shown working in a teaching capacity were not considered. So long as they are depicted as working in a research capacity, I also included social scientists (psychologists, sociologists, etc.).

and ultimately serves to “enter the biographical subject into the pantheon of cultural mythology, one way or another, and to show why he or she belongs there.”<sup>294</sup>

As biopic subject selections, in the words of A. Bowdoin Van Riper, are “not made in a vacuum,” but instead “reflect the broad contours of the history of science and technology and—more significantly—the American public’s awareness of it,”<sup>295</sup> the relationship between public memory and biographic film can be seen as a sort of bi-directional feedback loop.

That said, I disagree with Van Riper that even the “broad contours” of the history of science and technology can be gleaned from looking at biopics of scientific figures, as the individuals immortalized in scientist biopics in particular seem to be influenced by factors that have little to do with the actual extent of the individual’s contributions to society, or even their popularity. For example, neither Edward Jenner, pioneer of the smallpox vaccine, nor Jonas Salk, who developed the first safe and successful polio vaccination, rendering him a national hero and public figure in his own lifetime, have received any sort of fictional biographical treatment on film.

Generally, the early days of the biopic were predominated by depictions of royalty, which remains a popular biopic subgenre to this day. The story of the scientist biopic, meanwhile, does not really begin until 1936 with *The Story of Louis Pasteur*, making it somewhat of a late arrival.<sup>296</sup> It was also a highly dramatic entry—an unexpected success in spite of incredible odds, much like Pasteur’s own tale as depicted in the film. Though George F. Custen’s *Bio/Pics*, perhaps *the* seminal text of the history of the biopic, emphasizes the classical biopic as a

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<sup>294</sup> Bingham, *Whose Lives Are They Anyway?: The Biopic as Contemporary Film Genre*. 10

<sup>295</sup> A. Bowdoin Van Riper, *A Biographical Encyclopedia of Scientists and Inventors in American Film and Tv since 1930* (Scarecrow Press, 2011). xiv

<sup>296</sup> Van Riper, 2011: “Released by Warner Brothers in 1936, *The Story of Louis Pasteur* was Hollywood’s first attempt to make a feature film *about* the life of a historical scientist,” 89.

producer-driven and controlled genre with a particular emphasis on Daryl Zanuck's incredible degree of creative control at Fox, the story of *Louis Pasteur*'s production is well documented as being in total disagreement with this narrative.<sup>297</sup> Jack Warner rejected the script, but star Paul Muni loved it, and his incredibly atypical contract gave him final say. Warner didn't think audiences would have any interest in the story of a "milkman," but he was overruled. In his displeasure, he had the film produced under the worst possible conditions: minimal budget, a rushed schedule, re-used sets, and minimal publicity.<sup>298</sup> The studio still had no faith in the project and sold it to exhibitors at a reduced rate. The film went on to be a commercial success and win three Oscars—Best Actor, Best Story, and Best Screenplay. It ended up on many yearly "best of" lists, including that of *The New York Times* and the annual *Film Daily* poll of over 500 film critics. Mae Tinee of the *Chicago Daily Tribune* ended her review by commending, "Let the movies give us more of this sort of thing! And we shall know, understand, and immeasurably benefit by association with the great of all ages!"<sup>299</sup>

As the film domestically grossed \$665,000 and sold an estimated 13 million tickets, it is not surprising that, at least for a little while, the studios very much did give audiences "more of this sort of thing."<sup>300</sup> Warner Bros. continued on their scientist hero kick with the production of *Dr. Ehrlich's Magic Bullet* (1940), another tale of a scientist working more or less all hours of the day and night to advance the human condition while fighting an outdated bureaucracy. Twentieth Century Fox jumped on the bandwagon with *The Story of Alexander Graham Bell* in 1939 while MGM went for Thomas Edison and opted for two films instead of one: *Young Tom*

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<sup>297</sup> Custen, *Bio/Pics: How Hollywood Constructed Public History*.

<sup>298</sup> Robert Haas, "The Story of Louis Pasteur and the Making of Zora Neale Hurston's *Their Eyes Were Watching God*: A Famous Film Influencing a Famous Novel?," *Literature/Film Quarterly* 32, no. 1 (2004).

<sup>299</sup> Mae Tinee, "Review of 'the Story of Louis Pasteur'," *Chicago Daily Tribune*, March 17, 1936.

<sup>300</sup> Domestic gross not adjusted for inflation, Haas, "The Story of Louis Pasteur and the Making of Zora Neale Hurston's *Their Eyes Were Watching God*: A Famous Film Influencing a Famous Novel?."

*Edison* and *Edison, The Man* (both 1940). The scientist biopic boom came to an end in the 1940s, with the last major title being *Madame Curie* (1943).

While the biopic has maintained a constant presence in American film, trends in the subjects of biopics and the nature of biopics themselves, at least according to the argument most frequently encountered in the scholarship, have evolved over time. The standard narrative goes that the nature of the content of biographical films has shifted significantly over time, going from a highly regulated, structured, almost cookie-cutter-like narrative form in the studio era to an “auteurist” genre in the post-studio era, beginning with the 1967 *Bonnie and Clyde* and continuing to the present.<sup>301</sup> However, particularly in biopics centered around historical individuals who worked in STEM fields, such as *The Theory of Everything* and *The Imitation Game*, various dramatic elements associated with the “cookie cutter” shape of studio biopics are still alive and well, as this chapter will explore.

#### General Trends of the Scientific Biopic Subgenre

In the wake of the incredible success of *The Story of Louis Pasteur*, a dramatization of the life and accomplishments of the 19<sup>th</sup> century French chemist and biologist sometimes hailed as the “father of microbiology,” it is unsurprising that many of the scientist biopics that followed chose subjects who met similar criteria: Paul Ehrlich and his quest to cure syphilis (*Dr. Ehrlich’s Magic Bullet*, 1940), Dr. William T. G. Morton and his discovery of the use of ether as a general anaesthetic (*The Great Moment*, 1944), the nurse Elizabeth Kenny and her innovative approach to treating poliomyelitis (*Sister Kenny*, 1946). Even the 1943 biopic of physicist and chemist Marie Curie, *Madame Curie*, emphasizes the medical potential of radiation in cancer therapy.

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<sup>301</sup> Bingham, *Whose Lives Are They Anyway?: The Biopic as Contemporary Film Genre*.

Outside of these medicinally-charged biopics, the remaining scientist biopics produced by Hollywood within this period can all be classified as depicting mechanical “tinkerers” and their world-changing inventions: Alexander Graham Bell and the telephone (*The Story of Alexander Graham Bell*, 1939), Thomas Edison and the lightbulb (*Young Tom Edison* and *Edison, The Man*, both 1940), Robert Fulton and the first successful steam-powered ship built in America (*Little Old New York*, 1940), the Manhattan Project and the atom bomb (*The Beginning or the End*, 1947). The scientist biopic subgenre fell by the wayside when the Hollywood studio system lost its steam over the course of the 1950s.

In the 1970s biographical narratives of scientists made something of a comeback through made-for-television movies, with engineers and inventors taking center stage. In the aftermath of the Space Race, aviation and aerospace engineering emerged as new popular topics, with the 1970s producing two made-for-TV biopics about the Wright Brothers, *The Wright Brothers* (1971) and *The Winds of Kitty Hawk* (1978), and one about the Apollo 13 mission, *Houston, We've Got a Problem* (1974). The National Aeronautics and Space Administration (NASA), quite possibly the government agency whose cinematic depictions trend most positive of any government agency in the U.S., has a particularly stellar track record when it comes to biographical film. The only truly critical depiction the organization has faced in biographical film is the TV film *Challenger* (1990), about the explosion of the space shuttle of the same name. Celebratory biographical depictions of the organization and the scientific minds therein have been far more numerous, including *Moonshot* (2009) on the smaller screen and several cinematic releases starting in 1983 with *The Right Stuff*, detailing Project Mercury, the first manned spaceflight program in the U.S. In 1995 came the hugely successful *Apollo 13*; in 1999 there was *October Sky*, a biographical film about NASA engineer Homer Hickam. The 2010s



have added two more NASA history biopics the 2016 release *Hidden Figures*, detailing the work of female African-American mathematicians and engineers at NASA during the Space Race, and *First Man* (2018), a biopic of Neil Armstrong culminating with the Apollo 11 moon landing.<sup>302</sup>

The medically themed *scientist* biopic narrative died out in the 1940s and has never truly returned to cinemas, though it did make a small screen resurgence beginning in the 1980s. In 1988, *Glory Enough for All*, depicting the discovery and isolation of insulin by Frederick Banting and Charles Herbert Best, aired on PBS; in 1993 HBO (and NBC in 1994) aired *And the Band Played On*, depicting the rise of AIDS in the U.S. from the perspective of epidemiologist Don Francis, which went on to win three Emmys; earlier this year HBO aired *The Immortal Life of Henrietta Lacks*, depicting the isolation of the HeLa cell line, the first immortalized cell line, which would go on to revolutionize cancer research, from a biopsy from cancer patient Henrietta Lacks.

However, the medically themed biopic following underdog-fighting-the-system formula—a category to which several classic Hollywood scientist biopics fall, including *Dr. Ehrlich's Magic Bullet*, *Sister Kenny*, and the seminal *The Story of Louis Pasteur*—has made a return to the big screen in the past few decades, but as the stomping ground of *non-experts*. The 1992 biographical film *Lorenzo's Oil* depicts concerned parents Augusto and Michaela Odone's search for a cure for their son's adrenoleukodystrophy (ALD) and eventual formulation of the olive and rapeseed oil derived mixture known as Lorenzo's oil, which the film's conclusion postures as an effective treatment<sup>303</sup>. The narrative is structured such that the principal antagonist

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<sup>302</sup> Anthony D'Alessandro, "Universal's Damien Chazelle-Ryan Gosling Moon Landing Pic 'First Man' to Set Down in Fall 2018," *The Hollywood Reporter*, 7 March 2017.

<sup>303</sup> In reality, subsequent clinical trials have consistently found no evidence that Lorenzo's oil reverses or slows the progression of ALD in symptomatic patients, though results of trials involving asymptomatic ALD patients have suggested dietary therapy with Lorenzo's oil helps prevent or delay the onset of ALD symptoms.

is arguably not ALD but the medical and scientific establishments who often act as the “roadblocks” the Odone must overcome in the pursuit of their goal.

The Oscar-winning *Dallas Buyers Club* (2013) features a similar trajectory: in 1985, working-class everyman Ron Woodruff is diagnosed with AIDS and given a month to live. Much like the Odone, he does not accept this prognosis. The doctor supervising his treatment informs him about clinical trials of the antiretroviral drug zidovudine (AZT). She also explains that, par for the course of clinical trials, only half of the patients will receive the actual AZT while the remaining half receive placebos. Woodruff refuses to accept this as well, and instead obtains AZT himself through illegal means, but finds it ineffective. He travels to Mexico in search of treatment and meets Dr. Vass, who has had his American medical license revoked due his use of non-FDA approved drugs with AIDS patients, who calls AZT “poisonous” and provides Woodruff with a drug cocktail that has not yet been approved for trial in the U.S.<sup>304</sup>

The remainder of the film becomes a battle between Woodruff and the FDA, with the FDA filling the antagonistic role of the medical establishment in *Lorenzo’s Oil*, while the medical establishment is depicted as being a largely powerless body whose members either blindly follow the FDA or secretly support Woodruff. AZT and the FDA’s reluctance to test other potential treatments becomes symbolic of the organization’s ineptitude and even what might be called villainy in terms of the narrative, while the necessary measures taken to perform clinical trials in keeping with the scientific method and maintaining the falsifiability required of empirical experimentation are conflated with the anti-gay machinations of the Reagan administration. Though released to general critical acclaim, some commentators noted that the

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<sup>304</sup> Jean-Marc Vallée, "Dallas Buyers Club," (Focus Features, 2013).

film's approach to the AIDS crisis and the drug trials process is "perilously close to endorsing pseudoscience."<sup>305</sup>

Narratives of scientists going against attitudes upheld by the larger scientific establishment and ultimately emerging triumphant are still ultimately narratives about the triumph of science—the victory of a ridiculed truth over an accepted falsehood through the accumulation of undeniable empirical evidence. This is not the case with this newer strain of medical fight-the-system dramas, which are posited as victories over science and the scientific method. That said, this is how the trend has evolved when looking for a continuation of the "find a treatment" narrative shared by *The Story of Louis Pasteur*, *Dr. Ehrlich's Magic Bullet*, and *Sister Kenny*. The 1946 *Sister Kenny* can even be seen as something of a precursor to the fundamentally non-expert protagonists of *Lorenzo's Oil* and *Dallas Buyer's Club*, as Elizabeth Kenny was accepted as a volunteer nurse in World War I without any formal training and afterward continued to work in medical caregiving, developing her controversial polio treatment after the war ended without ever receiving formal training.<sup>306</sup>

A particular variant of the medically themed lone scientist fight-the-system narrative does still exist within the biopic genre if we allow for a different kind of motivation—that is, not a search for a cure. Instead, when scientists have been the protagonists of more recent medically themed fight-the-system biographies, they have been whistleblowers seeking to raise public awareness of particular health threats against the wishes of large and powerful industries: the exposure of the carcinogenic and addictive properties of cigarettes (*The Insider*), the connection between football and chronic brain damage (*Concussion*).

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<sup>305</sup> Daniel D'Addario, "'Dallas Buyers Club's' Narrow View of the AIDS Crisis," *Salon* 2013; Vallée, "Dallas Buyers Club."

<sup>306</sup> Harold Ellis, "Elizabeth Kenny: An Early and Controversial Physiotherapist," *Journal of Perioperative Practice* 19 (2009).

However, although the scientist biopic subgenre was originally founded by a narrative about a biologist and chemist, since the resurgence that has taken place following 2001's *A Beautiful Mind*, chemistry and biology have become the least represented fields within the genre. Instead, the triad of mathematics, computer science, and engineering/inventing, often overlapping within a single narrative, have become the real-life scientist stars of the silver screen: mathematician John Nash in *A Beautiful Mind* (2001), engineer Robert Kearns in *Flash of Genius* (2008), the ancient Greek mathematician Hypatia in *Agora* (2009), computer programmer Mark Zuckerberg in *The Social Network* (2010), inventor and computer entrepreneur Steve Jobs in *Jobs* (2013) and *Steve Jobs* (2015), theoretical physicist Stephen Hawking in *The Theory of Everything* (2014), computer scientist Alan Turing in *The Imitation Game* (2014), mathematician Srinivasa Ramanujan in *The Man Who Knew Infinity* (2015), and mathematicians Katherine Johnson and Dorothy Vaughn and engineer Mary Jackson in *Hidden Figures* (2016).

A second subcategory within scientist biopics that has maintained a consistent presence throughout the genre's 21<sup>st</sup> century resurgence is the social scientist biopic. Though John Nash was a mathematician, the rise of scientific biopics dealing with psychologists and sociologists can also be traced back to *A Beautiful Mind*, which was lauded, debated, and analyzed primarily not for its depiction of mathematics but schizophrenia, and how it handles the protagonist's abnormal psychology. Biopics of social scientists that deal heavily with sexuality have been especially common, including the Albert Kinsey biopic *Kinsey* (2004), the Carl Jung biopic *A Dangerous Method* (2011), and the William Moulton Marston biopic *Professor Marston and the Wonder Woman* (2017), which heavily emphasizes the role of Marston's polyamorous relationship with his wife Elizabeth and Olive Byrne.

Though multiple investigations regarding general trends in fictional depictions of scientists have similarly concluded that positive and in some cases even heroic depictions of scientists have been on the rise since the 1990s, it is interesting to note that one of these investigations specifically focused on mathematicians, with author Roslynn D. Haynes writing that, “[s]ince the 1990s, there has been an increasing number of fictionalized biographies and novels exploring the complex inner and outer lives of mathematicians” and calling “mathematicians, both real-life and fictional... representative of scientists now being depicted empathically.”<sup>307</sup> Especially in discussing public attitudes and popular depictions of scientists in the past few decades, it might be worth looking at the mathematicians, physicist, and social scientists who have been subject to increasingly positive portrayals separate from biologists (especially geneticists) and chemists, who are most often discussed in the context of the figure of the mad scientist due to a more direct connection to both alchemy and Frankenstein, and whose disciplines contain many of the most contentious and high-profile ongoing scientific controversies (GMOs, stem cell research, vaccine usage).

This makes the portrayal and inherent implications of the portrayal of movie scientists a valuable subject of study, and a more pressing matter than looking at fictional media portrayals of, for example, practicing physicians, because scientists are real people who frequently depend on public and government funding to support their work but whom, for the majority of the American general public, are an entirely foreign demographic known only, or at the very least primarily, through media representations. While biographical films are fictional, their basis in real people and events—almost always reemphasized through the repeated blazoning of “based

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<sup>307</sup> Roslynn D. Haynes, "Whatever Happened to the 'Mad, Bad' Scientist? Overturning the Stereotype," *Public Understanding of Science* 25, no. 1 (2016); Susan C. Losh, "Stereotypes About Scientists over Time among Us Adults: 1983 and 2001," *ibid.* 19, no. 3 (2010).

on a true story” across promotional materials and the film itself—makes scientist biopics and their reception by wide audiences a particularly intriguing barometer of sorts regarding public attitudes towards science and scientists.

### Case Studies: Two Taste-Makers and Their Progeny

After the proliferation of scientist biopics in the 1930s and 1940s, the subgenre nearly disappeared in the 1950s. From the 1960s through the 1990s, biographical films depicting the lives of scientists were mostly relegated to the world of television specials, with no decade producing more than three scientist biopics that received U.S. theatrical release. By comparison, 1940 alone featured four wide-release biographical films about scientists—*Dr. Ehrlich’s Magic Bullet*, *Young Tom Edison*, *Little Old New York*, and *Edison, the Man*. These sorts of numbers were not seen again until 2015, which saw the release of *Steve Jobs*, *Experimenter*, *The Stanford Prison Experiment*, *The Man Who Knew Infinity*, and *Concussion*.

In both the case of the 1930s/40s and the 2000s/10s, these scientist biopic “booms” began with a critically and commercially successful bellwether—*The Story of Louis Pasteur* in 1936 and *A Beautiful Mind* in 2001—that set various thematic, narrative, and structural precedents maintained by many of the films that followed. In the following two sub-sections, I will analyze both of these seminal films as well as, in each case, two later releases (released in the same year) which took considerable influence from these progenitor films. Though there are some differences between the two sets of films, their narrative approaches, as well as how and when they choose to differ most significantly from the historical record, are consistent in their desire to keep the subject framed in a positive light by minimizing or erasing any features with strong “Frankensteinian” connotations, as well as highlighting attributes that are “anti-Frankensteinian,” even if these attributes were introduced as a matter of creative license.

By “Frankensteinian,” I refer to any personality trait or narrative event (i.e. plot point) deemed dangerous due to its relation to the obsessive spiral Frankenstein follows leading to his creation of the monster, further embedded as a moralistic tale within American popular culture through its frequent reoccurrence throughout the influential works of Nathaniel Hawthorne, as discussed in the introduction of this thesis. “Frankensteinian” traits include the pursuit of knowledge for the sake of knowledge or power, research conducted in isolation (indoors) at the cost of interpersonal relationships, especially romantic and familial, or an interest in tampering with life beyond the treatment of disease.<sup>308</sup> “Anti-Frankensteinian” traits include the steady presence of the “humanizing woman” (usually a wife), active and consistent family involvement (“family man”), the pursuit of knowledge for altruistic reasons (e.g. for the good of the nation), a healthy lifestyle (time spent outdoors, etc.), and a regard for clearly stated “boundaries” of their work, with plainly expressed contempt for those who would cross them (i.e. try to play God).

As stated by Custen, the use of a public trial, or some other situation highly reminiscent of a public trial, was a popular narrative device among all kinds of Hollywood era biopics because it allowed “the specifics of a tale [to] be rendered more universal” by “laying bare the narrative device” and explicitly “telling the audience what the film is really about.”<sup>309</sup> In a sense, scientist biopics voluntarily and consistently put their subjects on trial for being Frankenstein in order to officially and irrevocably clear them of the crime. I will also substantiate the claim made earlier in this chapter that the selection of subjects for scientist biopics has been significantly determined by sociopolitical currents at the time of the films’ development as opposed to being

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<sup>308</sup> It is worth noting that no biographical film receiving a U.S. theatrical release has ever been made about a geneticist, though genetics and therefore geneticists are extremely popular in science fiction film, from *Gattaca* (1997) to *Jurassic Park* (1993) and sequels to *The Fly* (1958) and its progeny to *Blade Runner* (1982) and *Blade Runner 2049* (2017) to a number of *Frankenstein* inspired narratives such as *SplICE* (2009).

<sup>309</sup> Custen, *Bio/Pics: How Hollywood Constructed Public History*.

reflective of the relative impact of their subject's discoveries in their fields nor the prestige these individuals accrued in their lifetimes, either within their disciplines or as public figures.

Take One: *The Story of Louis Pasteur, Dr. Ehrlich's Magic Bullet, and Edison, the Man*

***The Story of Louis Pasteur (1936)***<sup>310</sup>

As mentioned before, *The Story of Louis Pasteur* did not just set the stage for the scientist biopic subgenre, but also remains one of its greatest success stories from both a critical and commercial perspective.<sup>311</sup> Starring Paul Muni, the film was released with low expectations from the studio and went on to be both a critical and box office success, being seen by an approximate ten percent of the U.S. population during its theatrical run.<sup>312</sup>

It was previously mentioned in this chapter that *The Story of Louis Pasteur* started the scientist biopic subgenre off with a bang, but it also literally starts off with a bang: the shooting of a Parisian doctor in his office in 1860. In his less than a minute of screen time his incompetence is introduced and reinforced as he is depicted as being behind schedule, clumsily grabbing almost-forgotten medical instruments and then rubbing them against the sleeve of his jacket to “clean” them, ultimately dropping one tool on the floor but simply picking it up and throwing it back in his bag. A man in a top hat shoots the doctor from the shadows.

The film then cuts to the killer's trial. When accused of murder, the man cries out “no, justice!” and accuses the doctor of killing his wife through his unhygienic methods (“with his dirty hands he gave her fever”). When told he cannot hold a doctor responsible for such a thing, the man pulls out a notice signed by Louis Pasteur. When the official interrogating the murderer

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<sup>310</sup> William Dieterle, "The Story of Louis Pasteur," (Warner Bros., 1936).

<sup>311</sup> It is, however, interesting to note that currently, of the three classic scientist biopics featured in this section, *The Story of Louis Pasteur* is now the hardest to acquire, though it was the most successful of the three upon its release. Though released on VHS, it has not yet received an authorized DVD or Blu-Ray release and is not available on any streaming platform.

<sup>312</sup> Ross England, "Louis Pasteur: A Light That Brightens More and More," *The Objective Standard* (2013).



asks the question, “Louis Pasteur... now who is he?” a dissolving side-wipe transitions to a medical boardroom, where a standing member delivers an answer: “he is a menace to science.” The film soon transitions once more to a new place and new people, once again discussing Pasteur’s pamphlet on microbes. “He isn’t even a doctor, sire, he’s a mere chemist,” a surgeon, Dr. Charbonnet, tells Napoleon III, before going on to describe the doctrine of spontaneous generation (which Pasteur will go on to disprove). Empress Eugénie interrupts her the rant against Pasteur, saying that she too has read the pamphlet and disagrees with his critique. She turns the tables on the surgeon by making a pointed comment regarding high hospital mortality rates, inspiring her husband to ask Dr. Charbonnet to explain that trend.

The film then cuts from the emperor of France to the view field of a microscope, and the voice of Louis Pasteur answers, “because our criminal disregard of germs and their power to invade the bloodstream is causing a death rate in child birth alone of three out of every ten mothers. Or in the city of Paris, over twenty thousand innocent and helpless women annually.” The film finally reveals the protagonist of the story. He turns to face the camera and it pulls back, revealing Pasteur is dictating this solemn message to his wife Marie, who carefully writes down his every word. It becomes clear that he is dictating is a letter to the medical governing body shown earlier, a defense of the pamphlet which resulted in the death of the doctor in the opening scene. Pasteur angrily tells his wife that he knows that the board will respond to his message by demanding proof of his claims. “Proof!” he scoffs, “as if the dead and dying weren’t proof enough of their stupidity!”

“But Louis, you can’t be sure,” Marie calmly replies. “You haven’t found the germ.” Pasteur does not respond, but his tone is significantly calmer when he crosses the room to ask his research assistants about his progress.

Within the first several minutes, *The Story of Louis Pasteur* has already identified Louis Pasteur as “special”—different in the sense that he is a crusader fighting against the system—while also making it explicitly clear he lacks any Frankensteinian tendencies. The film highlights that Pasteur’s work is not done in isolation, like in Shelley’s novel, nor in the company of a single companion (and destructive enabler), as has been the case of a number of influential *Frankenstein* adaptations, such as James Whale’s 1931 film of the same name, that gives Frankenstein a hunchbacked assistant by the name of Fritz. Instead, Pasteur’s research is done in the company of multiple colleagues and the calming, humanizing presence of wife Marie. Most importantly, the ideology behind Pasteur’s work is clearly stated: he is motivated by an unyielding and utterly altruistic desire to help people and save lives from the unintended but often irrevocable damage caused by ignorance and misinformation. This message is not only introduced early in the film but frequently reemphasized thereafter, with a number of scenes also validating Pasteur’s attitude by supporting not just his argument but the life-or-death significance of the work he is doing.

Unlike Frankenstein leading up to the creation of his creature, Pasteur does not thirst for knowledge for the sake of knowledge or seek personal power or glory through his work. Pasteur’s attitude, which is only about power in the sense that he seeks to bestow power upon everyday people by giving them the knowledge needed to defend themselves from ignorance and misinformation, is established as being just about as far from Frankenstein’s as possible. Furthermore, *The Story of Louis Pasteur* characterizes Pasteur as being duty-driven in all things, going so far as to chastise a young physician who approaches him in order to express his support once he realizes that the young man is the assistant of one of his primary detractors, Dr. Charbonnet. The young man refers to Charbonnet as a “fool,” at which point Pasteur indignantly

reminds the physician that “it is your duty to respect him then, not to ridicule him!” This is similarly in a direct contrast to Victor Frankenstein, who lets his duties as a son, brother, friend, and eventually husband fall by the wayside in his pursuit of creating life and later his pursuit of the creature he created. It is worth noting that Pasteur’s being quickly and explicitly established as anti-Frankensteinian is particularly salient as the film introduces him specifically as a *chemist*, the same term Shelley uses to describe Victor Frankenstein.<sup>313</sup>

Beyond the fact that even contemporary audiences would have largely been aware that spontaneous generation had been disproven, *The Story of Louis Pasteur* firmly establishes Pasteur as being in the right because he is the true expert, above and beyond any of the others around him. His genuine and superior expertise is demonstrated empirically—he is often shown observing phenomenon and then logically explaining them, with the viewer usually also getting the opportunity to observe what he does and “see through his eyes”—and reinforced through Pasteur’s way of explaining things, which often relies heavily on not just his numerous accumulated experiments but the published research of others, further emphasizing the scope of his knowledge.

Pasteur’s social graces are depicted as somewhat lacking as is stereotypical of the scientist figure. He is quick to disparage those he disagrees with, referring to individuals or groups of individuals as “idiots” or other comparable intelligence-based insults on over twenty occasions throughout the film, and at one point grabs a midwife’s unsanitary hand towel and tosses it into the fire before instructing her to “use a clean one.” However, the high stakes of his work and selfless nature of his dedication for the good of the nation and common people—

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<sup>313</sup> “From this day philosophy, and particularly chemistry, in the most comprehensive sense of the term, became nearly my soul occupation,” Shelley, *Frankenstein: Annotated for Scientists, Engineers, and Creators of All Kind*, 31.

“benefits of science are not for scientists, Marie, but humanity”—make his interpersonal shortcomings not a sign of his being socially clueless, but indicate he is a passionate moral crusader with his priorities straight. Counterbalanced by his dedication to his family and upright morals, Pasteur’s quirks do not add up to make him an “other.” Narratively he remains a relatable figure, and structurally his relatability is compounded by how the camera often shows Pasteur’s point of view in order to allow the audience to experience observations and discoveries along with the scientist, particularly when observing specimens under a microscope.<sup>314</sup>

Regarding the real, historical Pasteur, evidence from various records indicates his motivations for pursuing science were far more in line with Victor Frankenstein than *The Story of Louis Pasteur* would indicate. “Once one is used to working [in science], one can no longer live without it. And of course, everything in the world depends on it; in science, one is happy; in science one rises above all others,” Pasteur wrote in a letter to his family while studying for his Bachelor of Science.<sup>315</sup> “None but those who have experienced them can conceive of the enticements of science... in a scientific pursuit there is continual food for discovery and wonder,” Victor Frankenstein similarly insists in *Frankenstein*.<sup>316</sup>

While Pasteur’s dedication to his family and involvement with his wife and children are shown with a consistency that has been rarely matched in any of the scientist biopics that have been made since, the film nonetheless establishes several common scientist biopic tropes regarding the scientist’s dedication to science coming at great personal cost. One such trope is, as described by Van Riper, the “hero-scientist collapsing from overwork” scene.<sup>317</sup> This scene is

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<sup>314</sup> While the film shows a number of other individuals using microscopes, it is only on occasions when Pasteur is viewing something under a microscope that the film ever cuts to a point of view shot enabling the audience to see the microscope’s view field.

<sup>315</sup> Pasteur quoted in England, “Louis Pasteur: A Light That Brightens More and More,” 50.

<sup>316</sup> Shelley, *Frankenstein: Annotated for Scientists, Engineers, and Creators of All Kind*, 32.

<sup>317</sup> Riper, *A Biographical Encyclopedia of Scientists and Inventors in American Film and Tv since 1930*, 89.

often preceded by others in which the scientist neglects basic needs, namely food and sleep, for the sake of his or her work. Rarely in *The Story of Louis Pasteur* do Louis and Marie share a scene in which she does not comment on his neglecting sleep or failing to attend meals due to his work. Ultimately, Pasteur works himself into a stroke, though he is shown to recover more or less completely.

“Science, science, everything’s science!” Pasteur’s daughter Annette sobs to her mother in another scene, feeling as if she rarely ever sees her husband, an assistant of Pasteur’s. She soon calms down, gets to see her husband, and then appears to genuinely consider her earlier outburst something of an overreaction. This sort of outburst, though usually from the scientist’s significant other, has remained an incredibly popular trope of the scientist biopic, though few feature such a clean resolution or the involvement of a third party who takes the scientist’s side (Pasteur’s wife Marie) like in *The Story of Louis Pasteur*. Moving away from the theme of work-life balance, another dramatic element introduced by Louis Pasteur that has become a standard of the scientist biopic subgenre is the “triumphant speech about the value of science to mankind.”<sup>318</sup> As is frequently the case in scientist biopics, this triumphant speech occurs at the very end of *The Story of Louis Pasteur* and is delivered by an aged Pasteur to a large, cheering audience, and concludes with the line, “Say to yourselves first, ‘what have I done for my instruction?’, and as you gradually advance, ‘what am I accomplishing?’, until the time comes when you may have the immense happiness of thinking that you have contributed in some way to the welfare and progress of mankind.”

As mentioned before, one interesting aspect of *The Story of Louis Pasteur* that later scientist biopics have not maintained is the consistent role of Pasteur’s wife and children. To this

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<sup>318</sup> Ibid.

day, the featuring of the central scientist's love interest and family tends to be front-heavy, with the scientist's courtship of his or her spouse prominently featured early in the film to humanize the central scientist figure and provide the Hollywood standard romantic subplot<sup>319</sup>, with the spouse then relegated to a peripheral presence. Of the six scientist biopics analyzed in this chapter, this general pattern is followed at least to some degree in three: *Edison, the Man* (1940), *A Beautiful Mind* (2001), and *The Theory of Everything* (2014).

Overall, while Pasteur's personality and scientific motivations are significantly modified in ways that minimized similarities to Victor Frankenstein or more generally an archetypal "mad scientist" character, the majority of the events of *The Story of Louis Pasteur* have at least some historical basis, including a personal letter sent by Joseph Lister and the use of an experimental rabies vaccine on nine-year-old Joseph Meister that had only been successfully tested on dogs, though the timeline of various events were greatly altered.<sup>320</sup>

#### ***Edison, the Man* (1940)<sup>321</sup>**

The title of *Edison, the Man* is ultimately quite telling. Though it serves the utilitarian function of differentiating it from its companion *Young Tom Edison*, it also serves to indicate the main priority of the film—"humanizing" Thomas Edison: depicting the Wizard of Menlo Park, the inventor, the great innovator, as first and foremost a *man*—a likeable, relatable figure—no matter the cost. After all, with his lack of formal scientific training, huge output of practical inventions, and "genius is one percent inspiration and ninety-nine percent perspiration" attitude, Edison is, at first glance, the ideal *American* scientific hero—practical-minded, hard-working,

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<sup>319</sup> *The Story of Louis Pasteur* manages to still have a romantic subplot without featuring Louis and Marie's courtship through the relationship that develops between their daughter Annette and Dr. Jean Martel, an admirer of Pasteur's who goes on to become one of his research assistants.

<sup>320</sup> England, "Louis Pasteur: A Light That Brightens More and More."

<sup>321</sup> Clarence Brown, "Edison, the Man," (Metro-Goldwyn-Mayer, 1940).

and unblemished by the elitist, intellectual-aristocratic (and therefore European) shadow imposed by training in the ivory towers of academia. He has been referred to “America’s favorite inventor.”<sup>322</sup> However, the image of the generous, charming family man established in *Edison, the Man*, further emphasized by the casting of Hollywood A-lister Spencer Tracy as Edison, strays so far from historical records of Edison it would much more accurately be called *Edison, the Myth*.

In his comments on a screenplay draft for *The Story of Alexander Graham Bell*, producer, studio executive, and overall titan of the studio era Daryl F. Zanuck noted the need to normalize Bell’s genius, writing “A scientific person can be a strange bird.” Their film could not portray Bell as a “freak.” He had to be “so real, so human, so down to earth and such a regular guy.”<sup>323</sup> *Edison, The Man* does much the same with Thomas Edison. A handful of especially mild true-to-life quirks, such as Edison’s primarily pie-based diet, were allowed to remain (further specified to *apple* pie to make his unhealthy diet “wholesome” in a patriotic sense), but most were smoothed away entirely. The historical record of Edison is far from Tracy’s quirky-charming portrayal. For example, the real Edison did not like taking off his clothes, so he slept in them. As this might suggest, he was also averse to bathing. The film focuses on Edison’s work on the phonograph and electric light, skipping over the torpedo and the electric chair. The real-life Edison was married twice. His first wife, Mary Stillwell, provided the name for Rita Johnson’s character but little else. Whereas Johnson’s Mary is a seemingly endless well of support and rationality—the voice of reason who pulls Tracy’s Edison away from a research binge and whose continued presence keeps him a safe distance away from the dangers of a Frankensteinian spiral—the real Mary Stillwell was equally irresponsible in terms of finances and management,

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<sup>322</sup> Riper, *A Biographical Encyclopedia of Scientists and Inventors in American Film and Tv since 1930*, 123.

<sup>323</sup> Daryl Zanuck quoted in Custen, *Bio/Pics: How Hollywood Constructed Public History*, 90.

self-medicated her depression with over a pound of chocolate a day, and died at the age of twenty-nine.<sup>324</sup> MGM went to such lengths to make Edison's character supremely likable as to intentionally cast the most well-liked male stars in their retinue according to audience polls, Spencer Tracy and Mickey Rooney, as Edison in *Edison, the Man* and its companion film *Young Tom Edison* respectively.<sup>325</sup>

Turning to the sociopolitical currents underlying the production of *Edison, the Man*, the “technological unemployment” debates of the Great Depression still lingered in public memory. *Edison, the Man* can be seen as a direct counter-argument. Opening with a quote from Ralph Waldo Emerson and heavily laden with “Americana”—defined by Michael Böhnke and Stefan Machura as an emphasis on American identity and values, such as patriotism and “a strong belief in the Protestant work ethos”—the film concludes with a montage of Edison's various inventions superimposed over the visage of Spencer Tracy as Edison and featuring prominent block text, including, “CREATING JOBS, INDUSTRIES, WEALTH.”<sup>326</sup> Meanwhile, throughout the film Edison is depicted as being a poor bookkeeper and often running into trouble with debt, in part because he does not try to weasel maximum profits off of his work, in one scene selling an invention to a wealthy financier who, once Edison leaves the room, admits he would have been willing to spend several times that amount had Edison looked to haggle instead of simply accepting. As stated by Böhnke and Machura, “To an audience that has just survived an economic disaster, Edison's money problems may have appeared very sympathetic. The overall message is that Edison does not strive for riches but uses money to realize his ideas.”<sup>327</sup>

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<sup>324</sup> “The Talk of the Town: Edison, the Man,” *The New Yorker* 1990.

<sup>325</sup> Michael Böhnke and Stefan Machura, “Young Tom Edison—Edison, the Man: Biopic of the Dynamic Entrepreneur,” *Public Understanding of Science* 12, no. 3 (1940).

<sup>326</sup> *Ibid*, 320.

<sup>327</sup> *Ibid*, 329.



Significantly, there is a certain type of elitist undertone present in all five other scientist biopics analyzed in this chapter that is notably absent in *Edison, the Man*: the use of “idiot” or other pejoratives attacking the intelligence of the target as the ultimate insult. Muni’s Pasteur, Crowe’s Nash, and Cumberbatch’s Turing use them with incredible frequency. Robinson’s Ehrlich and Redmayne’s Hawking are somewhat less abrasive, but when, on the rare occasion, they do look to say something disparaging of another person, they primarily attack said individual’s intelligence.

***Dr. Ehrlich’s Magic Bullet (1940)***<sup>328</sup>

*Dr. Ehrlich’s Magic Bullet* is the most direct descendent of *The Story of Louis Pasteur*. Featuring the same director, William Dieterle, and centered around a scientist, Paul Ehrlich, with highly similar aims to Pasteur, the treatment of disease, and a similar devotion to this goal. The film makes Ehrlich’s attitude clear even faster than *The Story of Louis Pasteur* did Pasteur’s, opening with a title card superimposed over an illustration of Ehrlich’s face which reads, “This picture is dedicated to the memory of Dr. Paul Ehrlich whose dream it was to create out of chemicals ‘Magic Bullets’ with which to fight the scourges of mankind... and this is the story of his devotion to that ideal.”

Though the audience is told that Ehrlich is looking to discover new cures through chemistry, he is introduced as a physician, diagnosing a patient with syphilis and prescribing a course of treatment which he knows is of little use. The patient commits suicide almost directly afterward; the film cuts to Ehrlich relaying his frustrations to his wife Hedwig, who serves as a sounding board and voice of reason, much like Marie Pasteur does in *The Story of Louis Pasteur*. Ehrlich laments how “we know so little in science—very little,” a sentiment which closely

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<sup>328</sup> William Dieterle, “Dr. Ehrlich’s Magic Bullet,” (Warner Bros. Pictures, 1940).

matches ones voiced by Pasteur in his own biopic. Ehrlich's children are then introduced, and serve the same humanizing, levity-bringing role as Pasteur's children, providing the film with an excuse to show Ehrlich in a warm, playful light for the first time as he happily gives one of his daughters a piggyback ride. Unlike Pasteur's children, however, Ehrlich's disappear from the narrative more or less entirely following this early introductory scene.

Working primarily as a physician, Ehrlich makes use of a laboratory belonging to a man by the name of Sensenbrenner, who chastises him for not cleaning up properly the last time he made use of the space, implying Ehrlich is at least somewhat absent-minded, a trait often attributed to scientific types ("absent-minded professor"). Working in the borrowed laboratory space one night, Dr. Emil Von Behring stops by looking for Sensenbrenner, but ends up staying to discuss Ehrlich's experiments. Ehrlich shows the other scientist his experiments dyeing microscopic specimens. Like *The Story of Louis Pasteur*, the film makes repeated use of point of view shots displaying a microscope's view field, but unlike *The Story of Louis Pasteur*, the film does not limit these shots to when Ehrlich is the one looking into a microscope.

Though shown to be highly dedicated, Ehrlich's motives or methods are not depicted as staunchly anti-Frankensteinian as Pasteur's are. Though his focus does narrow to his search for a "magic bullet," with a motive of trying to reduce human suffering above all, Ehrlich's experiments early in the film are perhaps best described as dabbling—done out of curiosity and general desire to discover new things than in service of some ultimate specific goal. He is not as disciplined as Muni's Pasteur, but his moral compass points just as straight. To quote a contemporaneous review from the *Daily Boston Globe*, Ehrlich is "delicate, restrained and sensitive... a human being who lives and works and suffers, and has no resemblance to the

monstrosities that Hollywood once offered as heroes of its medical films” (21).<sup>329</sup> Then again, not being a labelled chemist, unlike Pasteur, Ehrlich does not need to absolve himself of the sins of mad science in the same way. The Frankenstein/”mad scientist” stereotype is older than the word “scientist” and it has been especially linked to chemistry and chemists for just as long.<sup>330</sup> Furthermore, Ehrlich is depicted as a much softer character than Pasteur and his razor-sharp tongue, with attributes like “humane” and “kind” being amongst the most common used in reviews to describe his disposition, and generally much more sociable, and so further removed than Pasteur from another negative scientist stereotype. Being so far removed from a Frankensteinian in personality traits enables Ehrlich a little more freedom regarding vaguely Frankensteinian behaviors, such as doing most of his research in relative isolation<sup>331</sup>, without beginning to seem unappealingly Frankenstein-like.

While Pasteur’s unhealthy work habits—skipping meals, going multiple days without sleep—are implied to be responsible for the deterioration of his health in *The Story of Louis Pasteur*, the scientist working him or herself into ill health takes reaches a whole new level in *Dr. Ehrlich’s Magic Bullet*, in which Ehrlich accidentally contracts tuberculosis through his work. He is also similarly depicted as missing meals and sleep for the sake of his research, and much like Marie Pasteur, his wife Hedwig repeatedly brings up this complaint over the course of the film. Hedwig is further removed from Ehrlich’s work than Marie, who would sometimes assist her husband in his lab in *The Story of Louis Pasteur* or discuss his research with him on a conceptual level. Instead of ever joining in on the “science talk,” as Marie sometimes does,

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<sup>329</sup> "Review of ‘Dr. Ehrlich’s Magic Bullet’," *Daily Boston Globe*, 1 March 1940, 21.

<sup>330</sup> Joachim Schummer, "Historical Roots of the “Mad Scientist”: Chemists in Nineteenth-Century Literature," *Ambix* 53, no. 2 (2006).

<sup>331</sup> That said, once Ehrlich is awarded his own research institute in the wake of his Nobel prize, he is shown working much more frequently in the company of assistants.

Hedwig is sent off on domestic tasks like fetching coffee or providing entertainment like playing the piano while her husband and his colleagues discuss scientific matters.

*Dr. Ehrlich's Magic Bullet* is a film laden with subtext, and not just regarding venereal disease. Ehrlich's Judaism is made abundantly clear without being explicitly stated, with one early scene featuring a doctor at Ehrlich's hospital telling a superior that "I have nothing against Dr. Ehrlich personally, although I must confess to a certain feeling against people of his faith in our profession," to which the supervisor immediately replies, "I quite understand." When the next scene features Ehrlich in that same office, being told off for various procedural breeches and culminating in the warning that "men like you usually have a very difficult time in this world because they do not know how to conform. You must learn, Ehrlich, it's conform, or suffer," it is evident that this warning is about Ehrlich's faith as much if not more than him not following the usual diagnostic protocol or losing track of time in the lab. Ehrlich's outsider status is also signaled in other ways, such as in a scene where he arrives at a Koch Institute event and hangs up his hat—the lone bowler in a row of top hats.

In addition to the underlying sociopolitical commentary on anti-Semitism and venereal disease, American viewers would find the huge diphtheria outbreak depicted around the midpoint of the film, spreading like wildfire and flooding hospitals with sick children, with many dying mere days after being perfectly healthy, extremely reminiscent of the polio outbreaks that would periodically ravage various areas throughout the country, primarily affecting children.

The various prejudices sometimes obliquely coded for in the film are also underscored through the explicit racism presented against an Asian man Ehrlich hires as a research assistant. "We do not approve of his employment when a man of pure German blood could fill the place," critiques one member of the government budgeting committee sent to inspect Ehrlich's lab.

“What has race to do with science?” Ehrlich asks. In response, the other man accuses Ehrlich of being “un-German,” to which Ehrlich responds, “in science, truth is master, not the state,” a considerable contrast to both *The Story of Louis Pasteur* and *Edison, the Man* in which the scientific search for truth and the patriotic goals of the nation are conflated to the point of becoming synonymous, with “for science” and “for country” being one and the same.

Thematically, another connection between the three biopics is the fundamental importance of sight and seeing. *The Story of Louis Pasteur* and *Dr. Ehrlich’s Magic Bullet* both feature heavy use of microscopes and microscopic field of view insert shots, enabling the audience to engage with the central scientist’s reasoning and discovery processes alongside the character, with the scientists demonstrating their arguments to those who doubt them (or those who simply wish to learn) by showing them and instructing them *how* to see (i.e. the seeing skill that is proper microscope usage). Furthermore, before Ehrlich starts the quest for his “magic bullet,” he is shown primarily working on developing methods of staining microscopic specimens. Large swathes of *Dr. Ehrlich’s Magic Bullet’s* can be summarized as various people asking various other people to look at this or that under a microscope. Whenever a new discovery is made over the course of the film, it then goes through the systematic ritual of being verified through sight. This is the case both for new knowledge Ehrlich discovers himself and for things he learns from others. For example, when Ehrlich is sent a paper announcing the discovery of the cause of syphilis for peer review, he immediately asks one of his assistants to contact the laboratory involved and request a sample. The scene then transitions via a dissolving side-wipe to Ehrlich looking in a microscope and excitedly muttering, “it’s true, it’s true!” The film then cuts to his point of view, allowing the audience to see a number of wriggling bacteria

that match the description from the research paper that he read aloud to his assistants in the earlier scene.

While not abrasive in the way of Muni's Pasteur, Ehrlich does have a moment of scientific social ineptitude at an important formal dinner, Ehrlich's one opportunity to secure the money he desperately needs after the government cut his funding by convincing a wealthy banker's widow, Mrs. Speyer. Another guest asks Ehrlich what his current research is about, to which Ehrlich bluntly replies, "syphilis," drawing sharp glares from the entire table—apart from Mrs. Speyer, who luckily is not quite so easily flustered. When asked to explain the principles behind his hypothesis, Ehrlich pushes his soup course aside and begins to draw a diagram on the tablecloth. His wife Hedwig is appalled but Mrs. Speyer is not, and ultimately ends up funding Ehrlich's research.

Ehrlich's quest for a "magic bullet" to cure syphilis does not go particularly well. After 606 attempts he discovers Salvarsan, but when moved to clinical trial, the drug proves more dangerous than anticipated, and a number of patients die. Ehrlich is put on trial, and though he is ultimately exonerated, the stress proves too much for his fragile health, and he dies shortly thereafter. On his deathbed, he delivers a concluding speech on the values of science, in standard scientist biopic form, though its tone is relatively solemn and cautionary in light of the limited success of his "magic bullet" search.

Take Two: *A Beautiful Mind*, *The Theory of Everything*, and *The Imitation Game*

Dennis Bingham's *Whose Lives Are They Anyway: The Biopic as Contemporary Film Genre* defines the 21<sup>st</sup> century biopic resurgence as being somewhat reactive, even somewhat antagonistic, to the biopics of the studio era, particularly when dealing with male subjects,

writing that “films about men have gone from celebratory to warts-and-all to investigatory to post-modern to parodic.”<sup>332</sup>

While the biopic genre more broadly might follow this trend, the celebratory tone of the studio era biopics has been largely preserved within the scientist biopic subgenre, as have many of the strategies undertaken by scientist biopic filmmakers in their handling of narrative structure, character development, and the historical record.

While the midcentury Hollywood biopics discussed in the prior section and the 21<sup>st</sup> century releases being discussed in this one emphasize how their protagonists are significantly *different*, the identification and posturing of this difference differs considerably between the films made in these two different periods. In the studio era, the “difference” highlighted by the biopics analyzed in the prior section was established through fight-the-system narratives. Louis Pasteur and Paul Ehrlich are lone crusaders fighting against a bloated and inept scientific bureaucracy, while Tom Edison is an idealistic tinkerer who fights both the looming, unseen nay-sayers of the “scientific community” and wealthy financiers with selfish intentions. The genius which enables their scientific discoveries and groundbreaking inventions also enables them to see the error of popular thinking.

Meanwhile, qualities that made them different as individuals—unflattering or “odd” personality traits, quirks, or aspects of their personal lives—are almost entirely glossed over with the intention of making the central scientist figures as likeable and relatable as possible. The three films analyzed in the previous section posit Louis Pasteur, Paul Ehrlich, and Thomas Edison as different—“special”—but not *fundamentally* “other.” In other words, they normalize

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<sup>332</sup> Bingham, *Whose Lives Are They Anyway?: The Biopic as Contemporary Film Genre*, 10.

the scientific genius and obsessive drive of these three figures by following the Daryl F. Zanuck formula and making them “so human, so down to earth and such regular guy[s].”<sup>333</sup>

In all three of the recent scientist biopics I analyze in this section—*A Beautiful Mind*, *The Theory of Everything*, and *The Imitation Game*—scientific genius and fundamental otherness are explicitly linked. John Nash is schizophrenic, Stephen Hawking has ALS, and Alan Turing is gay in a time and place where homosexuality is held as a punishable crime. These aspects of these three particular scientist-heroes enable the films in question to make themselves socio-politically relevant through aligning themselves with three politically charged, high-profile human rights campaigns—mental health awareness and advocacy, ALS and disability rights, and gay rights—an angle which all three made heavy use of in awards season campaigning, and with considerable success.<sup>334</sup>

Recent biopics are not merely more willing to accept the “strange birds” of science instead of reshaping them into a cookie-cutter preconception of a “relatable” person, the “strange birds” are now the ones they are most interested in displaying, and for that exact reason. While the attitude has changed since Zanuck’s day, the underlying belief has not: a scientist, on some fundamental level, *is* a strange bird. The warts and flaws that these three biopics embrace do not serve to make their central figures recognizably human, but emphatically different and “other.” Elements of their personalities or personal lives that would depict them as flawed in ways that would not also contribute to them being characterized as being fundamentally strange or unusual are still polished away in studio era-like fashion. While the scientist hero of the studio era is a relatable revolutionary, the scientist hero of the 21<sup>st</sup> century is a fundamentally strange creature.

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<sup>333</sup> Custen, *Bio/Pics: How Hollywood Constructed Public History*, 90.

<sup>334</sup> *A Beautiful Mind* won four Academy Awards (Best Picture, Best Director, Best Adapted Screenplay, Best Supporting Actress) while *The Imitation Game* and *Theory of Everything* each won one (Best Adapted Screenplay and Best Actor, respectively).



### *A Beautiful Mind* (2001)<sup>335</sup>

The story of scientist biopics in the 21<sup>st</sup> begins with the 2001 critical and commercial success *A Beautiful Mind*, documenting the life of mathematician John Nash. In its portrayal of Nash's "flawed" personality and schizophrenia, it has been elsewhere claimed that the film suits Bingham's classification of a "warts-and-all" depiction.<sup>336</sup> However, both the concepts of "warts-and-all" and depiction of a "flawed" character contain a subtext of relatability. As real people are flawed, this terminology suggests that *A Beautiful Mind* (and its progeny) present scientist figures that are *more* relatable to an audience than the highly sanitized, normalized portrayals presented in the biopics of the studio era. However, upon closer inspection, the opposite trend is actually visible. In several regards, *A Beautiful Mind* sanitizes Nash and his personal life in ways reminiscent of studio era biopics to make him more appealingly heroic, but unlike studio era biopics these efforts seek to emphasize Nash as being fundamentally different (abnormal) instead of relatable.

*A Beautiful Mind* is quick to set up Nash as a hero, in the sense that the film begins with a Princeton professor telling his class that, "mathematicians won the war," and then introduces college student John Nash, a math prodigy. In doing so, the film appeals to a connection between scientific achievement and military heroism that has been frequently featured in scientist biopics since *The Story of Louis Pasteur*, which covers the course of the Franco-Prussian War with a title card overlaid on top of a superimposition of Pasteur looking into a microscope and the microscope's view field reading "While men fought and killed one another, Pasteur was fighting microbes—the real enemy of all mankind." Ultimately, this appeal strongly suggests the

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<sup>335</sup> Ron Howard, "A Beautiful Mind," (Universal Pictures, 2001).

<sup>336</sup> Ellen Cheshire, *Bio-Pics: A Life in Pictures*, Short Cuts (New York: Wallflower Press, 2014), 83.

following chain of inductive reasoning: mathematicians are heroes and John Nash is a mathematician, therefore John Nash is a hero.

While *A Beautiful Mind* does not shy away from Nash's schizophrenia—though it does take considerable liberties with it, making his hallucinations visual and therefore far more cinematically appealing than the auditory hallucinations Nash actually suffered—it sanitizes other elements of his personality and personal life.<sup>337</sup> The “warts-and-all” of Nash's personality that would not contribute to him being a “strange bird” but merely a flawed human being are smoothed away, as Cynthia Rockwell explains when comparing Sylvia Nasar's Pulitzer Prize-winning biography with the film it inspired:

“The book delivers a John Nash who is arrogant, selfish, unkind and unrepentant—traits that are either removed from or made charming in the film. The film does not, for example, include the fact that Nash often belittled students and colleagues as stupid if they merely asked him to clarify something: the film instead gives us a few playfully arrogant quips intended to make Nash seem endearingly socially inept rather than cruel.”<sup>338</sup>

Furthermore, in real life, John Nash had an illegitimate son by another woman, Eleanor Stier, whom he refused to marry, allegedly on the grounds that she was socioeconomically beneath him.<sup>339</sup> This entire aspect of Nash's life is cut from *A Beautiful Mind* entirely in the service of idealizing Nash's relationship with his wife Alicia. The film features their meeting and courtship as a key subplot, but is also, much like *Edison, the Man*, the area where it takes the greatest degree of creative license. And again, much like in *Edison, The Man*, while John Nash's

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<sup>337</sup> Ibid, 84-85.

<sup>338</sup> Rockwell quoted in *ibid*, 85

<sup>339</sup> John Sutherland, "Beautiful Mind, Lousy Character," *The Guardian*, 18 March 2002.

character is sanitized towards this end, Alicia Nash's story and personhood are more or less entirely stripped away.

In *A Beautiful Mind*, Alicia Larde (Jennifer Connelly), later Nash, is portrayed in a loving, supporting, steady light highly similar to Rita Johnson's Mary Stillwell. The film's Alicia is a constant supportive presence who saves John from a more dangerously Frankensteinian isolation—a necessary humanizing agent. In reality, Alicia and John Nash divorced in 1963, later reconciling and eventually remarrying in 2001. However, in order to fulfill this necessary supporting woman role that has been a staple of the scientist biopic subgenre since *The Story of Louis Pasteur*, Alicia's individual is stripped away to the point where film critics reacting to the film upon its initial release commented on it. "The major drawback is Alicia," Kirk Honeycutt criticized in his review for *The Hollywood Reporter*. "While Connelly gives a grounded, effective performance, she is written sketchily by Goldsman. We never even learn that Alicia is an immigrant from El Salvador or what her work entails. And following the couple's marriage, hers becomes a totally reactive role."<sup>340</sup>

There are a number of parallels to be made between the wives of *A Beautiful Mind* and *Edison, the Man*, both in their narrative roles within the films and in how their cinematic depictions relate to the historical record. Connelly's Alicia follows more or less the exact trajectory of Rita Johnson's Mary Stillwell in *Edison, the Man*. First introduced as clever, independent women—Mary working in the same building as Edison, Alicia a student in one of Nash's classes—following their marriages they are relegated entirely to the domestic sphere, never mentally or physically engaging in their husbands' work, even though in real life Alicia

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<sup>340</sup> Kirk Honeycutt, "Review of 'a Beautiful Mind', Directed by Ron Howard," *The Hollywood Reporter*, 17 December 2001, 6.

Nash worked as a physicist, aerospace engineer, and system programmer before eventually becoming a full-time mental healthcare advocate.<sup>341</sup>

While both *A Beautiful Mind* and *Edison, the Man* take considerable pains to show their scientist heroes as family men, covering the courtship of their wives and the resulting children, once it is established that they have indeed followed those social norms of marriage and reproduction, their families, having served their narrative purpose, are shafted off to the side. John Nash's son is never even referred to by name in *A Beautiful Mind*, even though he is named in honor of his father, the very same man the film celebrates.

I described earlier how 21<sup>st</sup> century scientist biopics have embraced Zanuck's 1938 comment that "a scientific person can be a strange bird," but it is important to note that this is not just in terms of extrapolating consistent underlying themes, but the steady presence of vocalized self-diagnoses. Modern scientist biopics are full of scientists calling themselves strange birds. In *A Beautiful Mind*, Nash calls himself and Alicia "a couple of odd ducks," and the exact same terminology will come up again in *The Imitation Game*. With its prevalence throughout films of this nature, it is unsurprising that this phrase also shows up repeatedly in reviews and commentary. "John is an odd bird from the start," Kirk Honeycutt comments in his review of *A Beautiful Mind* for *The Hollywood Reporter*.<sup>342</sup> Correlation does not imply causation, but repeated coincidence *does* imply correlation. Zanuck wrote that scientific people *can be* strange birds; the host of scientist biopics released in the 21<sup>st</sup> century thus far do not merely suggest that scientists can be, but that they definitively *are* strange birds. While these films are on the whole celebratory where Zanuck's comment was made disparagingly, both re-emphasize the same underlying concept that scientists are somehow fundamentally different from an average person.

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<sup>341</sup> Donna Fultz-Key, "Media Watch: 'A Beautiful Mind'," *The Lancet Neurology* 1 (2002).

<sup>342</sup> Honeycutt, "Review of 'a Beautiful Mind', Directed by Ron Howard," 20.

As Mary W. Gray writes in an article for *The Mathematical Intelligencer*, “mathematicians featured in film tend to be more than a bit weird.”<sup>343</sup> It is worth considering the possibility that this shift to an emphasis on weirdness within the scientist biopic subgenre occurring in conjunction with a move away from subjects working in the Frankensteinian fields of biology and chemistry and towards scientists whose work does not directly interfere with the stuff of life—chalkboards and machines instead of microscopes and specimens—might not be purely coincidental.

### ***The Theory of Everything* (2014)<sup>344</sup>**

*The Theory of Everything* opens briefly in the late 1980s, with Stephen Hawking (Eddie Redmayne) about to receive an unspecified honor. It then flashes back to Hawking’s university days, and from there on the majority of the film moves forward in a generally linear narrative before reaching the first scene once more, at which point it concludes with a climactic montage. Structurally, *The Theory of Everything* is a relatively close descendant of *Edison, the Man*. The film begins with the aged scientist-hero getting ready to receive an honor, then rewinds to his youth and the courtship of his wife, and ultimately returns to the opening scene the scientist-hero receiving that honor and the delivery an emotional speech before a large adoring crowd, before ending with an extended montage.

Redmayne’s Hawking has a quirky-charming persona not unlike Edison’s in *Edison, the Man*. When the film moves to Hawking’s university days, it introduces him as racing his bicycle against best friend Brian down the winding streets of Cambridge. Their destination is soon revealed to be a house party. As Stephen Hawking would more likely be known to audiences, at least by vague reputation, than any of the other biopic subjects in this essay save Thomas Edison,

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<sup>343</sup> Mary Gray, "Review of 'Math Goes to the Movies'," *The Mathematical Intelligencer* 38, no. 1 (2015), 90.

<sup>344</sup> James Marsh, "The Theory of Everything," (Focus Features, 2014).

the film is quick to establish him as being as far from a Victor Frankenstein or any such negative scientist stereotype as possible—he’s active, sociable, up for a party. Of all of the three 21<sup>st</sup> century scientist-heroes investigated in this section, Redmayne’s Hawking is the only one who never refers to himself as an “odd duck,” though when Jane sees Stephen for the first time at this house party and asks her friend Diana about him, she immediately responds that he’s “strange” and “clever.”

Of all of the publications that have been written by or about Stephen Hawking, *The Theory of Everything* was primarily adapted from Jane Hawking’s memoir *Travelling to Infinity: My Life with Stephen*.<sup>345</sup> Though the film does not restrict itself to Jane’s perspective, it is more grounded in her perspective than her husband’s, even though the film, much like her life, is centered around him. As such, while Jane’s trajectory as an individual possessing unique goals and interests falls by the wayside once she gets caught in Hawking’s orbit, like many a scientist-hero’s wife before her, she remains a consistent presence throughout the film. It is perhaps because of its basis in Jane Hawking’s memoir instead of Stephen Hawking’s works or a biography of Stephen Hawking that *The Theory of Everything* actually depicts the disintegration of the Hawking marriage while *A Beautiful Mind* skips over John and Alicia Nash’s divorce and *Edison, the Man* ignores Mary’s death and Edison’s second marriage.

Overall, *The Theory of Everything* depicts its central scientist-hero as relatable and accessibly human in a way that is quite unlike either *A Beautiful Mind* or *The Imitation Game*, though certain elements typical of a scientist biopic still remain, particularly in the film’s centering of the courtship of the scientist-hero and his wife to make him a more relatable figure.

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<sup>345</sup> Colin Macilwain, "And the Winner Is: Not Science," *Nature* 518 (2015), 132.

### *The Imitation Game* (2014)<sup>346</sup>

*The Imitation Game* begins with Alan Turing being interrogated, but unlike Pasteur in *The Story of Louis Pasteur*, he is not being interrogated about his work, but a break-in at his home. From there, *The Imitation Game* follows the pattern of a retrospective bookended narrative like *Edison, the Man* and *The Theory of Everything*, where the film begins with the aged scientist looking back for one reason or another before it jumps back to the earlier period upon which the older scientist is reflecting. The film then moves in a generally linear fashion, before concluding with the aged scientist, usually more or less where it began. *The Imitation Game* somewhat breaks up the linearity of the central Bletchley circle narrative by interspersing flashbacks of Turing's schooldays and short flash-forward sequences featuring the inquiries of one of the detectives interrogating Turing, Detective Nock, after the mathematician piques his interest.

In personality, Turing is depicted as even more arrogant than Crowe's John Nash. However, unlike Nash or Muni's Pasteur, who could also be abrasively acerbic, these key facets of Turing's personality—his genius and his rudeness—are established entirely outside of the context of his field of study. He insults the detectives who show up to his home after a reported break-in, and then proceeds to accuse one of the detectives of being hungover before explaining how he reached that conclusion via Sherlock Holmesian deduction. Alan Turing is characterized in *The Imitation Game* as more or less a Sherlock Holmes avatar, particularly Sherlock Holmes as characterized in the popular BBC series *Sherlock*, an interpretation further suggested through the casting of *Sherlock*'s Sherlock Holmes, Benedict Cumberbatch, as Turing. Much like the casting of Spencer Tracy as Edison maximizes Edison's credibility as a likable everyman in

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<sup>346</sup> Morten Tyldum, "The Imitation Game," (The Weinstein Company, 2014).

*Edison, the Man*, the casting of Benedict Cumberbatch further reinforces Turing as not just a socially challenged genius but a psychologically *abnormal* genius.<sup>347</sup> And once again, Cumberbatch's Turing self-diagnoses himself as having that archetypal disease described by Zanuck. "Mother says I'm just an odd duck," young Turing confesses to his one friend, Christopher, in a schooldays flashback.

While Turing is depicted as an isolated, obsessive genius, *The Imitation Game* still highlights anti-Frankensteinian tendencies of Turing, such as a preference for jogging and general exercise. The film also ignores a key Frankensteinian element of Turing's life—his work in (theoretical) biology, that other Frankenstein-associated science besides chemistry.

*The Imitation Game* separates Turing from the crowd beyond his intelligence on not one but two fronts: his sexuality and his interpersonal skills. The film uses childhood flashbacks to more emphatically code Turing as being somewhere on the autism spectrum, with one particular flashback exchange featuring young Turing saying to a friend, "When people talk to each other they never say what they mean. They say something else. And you're supposed to just know what they mean. Only, I never do."<sup>348</sup> Thematically, Turing's inability to connect with others or socialize normally is given far more significance than his homosexuality. When he interviews to join the Bletchley circle in their efforts to crack encrypted German messages, much is made of

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<sup>347</sup> Cumberbatch has arguably been typecast with more frequency in high-profile "abnormal genius" roles that any other actor working currently; he now brings such connotations to any genius role he plays. The "abnormal" aspect of his characters' genius has been everything from him being the product of genetic engineering (*Star Trek Into Darkness*), having supernatural powers (*Doctor Strange* or *The Hobbit* trilogy, in which he plays the riddle-loving dragon Smaug), or abnormal psychology (*Sherlock*, in which Sherlock Holmes repeatedly diagnoses himself as a "high-functioning sociopath"); he also alternated between playing Dr. Frankenstein and the Monster in the highly successful premiere production of the Nick Dear adaptation of *Frankenstein* at the Royal National Theatre in London, which ran from February to May 2011.

<sup>348</sup> Turing's comments about his inability to connect with people frequently resemble comments made by schizophrenic mathematician John Nash in *A Beautiful Mind*, such as the scene in which Nash tells roommate and lone friend, Charles—later shown to be a hallucination of Nash's schizophrenic mind—that "I don't like people much and they don't like me."



how Turing, for all his mathematical genius, does not understand sarcasm or humor. Just a handful of scenes later, when Turing is shown having just joined the Bletchley team, an invite out to lunch from colleague Hugh Alexander becomes a drawn-out exchange when Turing fails to understand the invite, and Alexander's repeated attempts at clarification only deepen the misunderstanding. Though Turing was alone and isolated in a sense by his sexuality, historical records suggest he was far more amicable and sociable than *The Imitation Game* suggests.<sup>349</sup>

At the end of the day, *The Imitation Game* is perhaps the most paint-by-the-numbers "Great Man" biopic the 21<sup>st</sup> century has produced thus far. Though he is shown as part of a team at Bletchley, they remain strictly peripheral, with Turing's already extraordinary accomplishments overstated by the film: "Fault can be found with the 'Eureka' moment of discovering the usefulness of cribs, something long obvious to cryptographers, but the fact that Turing did construct a machine was certainly the key to speeding up the process."<sup>350</sup>

The most prominent supporting role is given to Joan Clarke, who fills a slightly modified version of the humanizing woman role on account of Turing's homosexuality. Though she only comes as close to being Turing's wife as participating in a short-lived sham engagement, Joan Clarke plays the role of humanizing woman more or less beat-for-beat. She's the person who makes Turing leave the isolation of his work to go for a drink and serves as a sort of interpersonal interpreter for him, helping him build some level of comradery with his co-workers. "If you really want to solve your puzzle then you're going to need all the help you can get, and they are not going to help you if they do not like you," she warns.<sup>351</sup> In another scene she

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<sup>349</sup> "there seems to be no real evidence... that Turing was autistic as some might infer from the present film," Mary Gray, "The Imitation Game," *The Mathematical Intelligencer* 38, no. 1 (2015), 88.

<sup>350</sup> Ibid.

<sup>351</sup> In the next scene Turing looks to mend fences by bringing his co-workers apples and attempting to tell a joke, once again re-emphasizing Turing's supposed inability to understand humor, which appears to have no basis in historical accounts of Turing.

smooths over ruffled feathers when Turing reacts to a colleague's breakthrough in a typically blasé manner, to said colleague's irritation, with a joke that such a response is how Turing says "thank you." In the film, this is repeatedly the nature of Clarke's most important contributions—not revelations brought about by her being a highly skilled and well-trained mathematician in her own right, but by filling in for Turing's non-existent interpersonal skills.

Interestingly, it is reported that the real Turing told a work colleague, Don Bayley, that if he was to ever actually marry, it would have to be to "someone who was not a mathematician but could instead look after his domestic needs."<sup>352</sup> Within the scientist biopic subgenre, this has been the exact depiction of the scientist's wife from *The Story of Louis Pasteur* to *Dr. Ehrlich's Magic Bullet* to *Edison, the Man* to *A Beautiful Mind* and *The Theory of Everything*, regardless of the truth of the couples' actual relationship dynamics, which tended to be far more varied. Ironically, though such reasoning ruled out Joan in real life, her role in *The Imitation Game* is decidedly domesticized in this vein. She is even brought back for one of the final scenes of the film to fuss over Turing and express shock and horror at the consequences of his hormone treatments, enabling those sentiments to be clearly vocalized while allowing Turing to maintain a decided air of martyrdom, and delivers a concluding speech emphasizing Turing's contributions to science and society, a subdued version of the trend found across all six scientist biopics analyzed in this chapter.

Again, following the 21<sup>st</sup> century scientist biopic film trend of highlighting difference over relatability, the horror of the court-mandated hormone therapy Turing is forced to undergo is depicted in *The Imitation Game* as affecting Turing's otherworldly mind, rendering him unable

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<sup>352</sup> G. S. Voss, "It Is a Beautiful Experiment': Queer(Y)ing the Work of Alan Turing," *AI & Society* 28, no. 4 (2013), 571.

to even solve a crossword puzzle. Historically, the treatments had a far more profound and discomfiting impact on Turing's body, causing him to, among other things, grow breasts. The film posits the hormone therapy caused loss of mental function for Alan Turing as a sort of singular punishment no one else could hope to understand because Turing is in possession, as the audience is repeatedly reminded, of a singular and unparalleled mind, when the reality involved a loss of familiarity and dissociation with his own body, an ordeal similarly horrible but far more relatable.<sup>353</sup> Most people do not have a mind like Alan Turing, but they do possess a body susceptible to changes through hormone therapy.

As discussed previously, Turing's sexuality is not depicted as an important aspect of his character in *The Imitation Game*, but it took center stage for the film's award season campaign strategy, with Todd McCarthy of *The Hollywood Reporter* commenting that, "Attaching a movie to a worthy cause has, of course, become de rigueur among modern-day Oscar campaigns."<sup>354</sup> Prior to Harvey Weinstein's fall from grace following the October 2017 *New York Times* report which revealed a decades-long history of sexual abuse, he was widely known as Hollywood's most aggressive and affective awards season campaigner. In addition to releasing promotional videos interspersing images of Turing with modern-day gay rights demonstrations, the promotional campaign heavily featured pull quotes endorsing Turing or *The Imitation Game* from the presidents of human rights organizations such as the Human Rights Campaign and GLAAD, as well as popular gay celebrities such as Anderson Cooper, instead of prioritizing endorsements from film critics.<sup>355</sup> Overall, much like in the case of *A Beautiful Mind* and *The*

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<sup>353</sup> Andrew Robinson, "The Enduring Enigma of Alan Turing," *The Lancet* 384 (2014), 1420.

<sup>354</sup> Todd McCarthy, "The Imitation Game Finally Plays the Gay Card," *The Hollywood Reporter*, 6 February 2015. 40

<sup>355</sup> Hunter Schwarz, "The Imitation Game Isn't Really About Gay Rights, but Its Oscar Campaign Is," *The Washington Post*, 21 February 2015.

*Theory of Everything, The Imitation Game* overwhelmingly conforms to the narrative patterns and tropes established in the traditional Hollywood biopic, even at the cost of historical accuracy.

## Chapter Four

### **The Scientist Goes to the Remakes: *The Thing* and *The Fly***

Why remake a film? Hollywood has been retelling the same stories over and over again since its nascent days for a range of reasons. In the case of these two sets of narratives, the rationale behind remaking films released in the 1950s were twofold: the first, the newfound freedom with regards to explicit content, the second, technological advancements that unlocked new possibilities for stories involving shapeshifting and mutagenesis.

The reasoning for focusing on these two sets of narratives is multifold. John W. Campbell's *Who Goes There?*, from which both versions of *The Thing* were adapted, and George Langelaan's "The Fly," were both short fiction published in magazines that first made it to screens in the 1950s science fiction cinema boom. As such, the films are both remakes and adaptations, and therefore each of these two sets of narratives form distinctive triangular relationships between the remake, the original film, and the corresponding literary source.<sup>356</sup> Both sets of narratives feature scientist characters in major roles, and both received prominent 1980s remakes from horror auteurs, John Carpenter and David Cronenberg.<sup>357</sup> In both cases, the 1950s films were commercial successes. *The Fly* (1986) was critically well-received and remains Cronenberg's most commercially successful film to date, and while *The Thing* (1982) was infamously panned upon initial release and a box-office flop—Carpenter's first after a string of hits—it has since been re-evaluated and considered among Carpenter's finest work.<sup>358</sup>

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<sup>356</sup> Thomas Leitch, "Twice Told Tales: The Rhetoric of the Remake," *Literature/Film Quarterly* 18, no. 3 (1990).

<sup>357</sup> It is worth noting that while several texts try to make distinctions between the horror and science-fiction genres, for the purposes of this chapter all four films in question are being regarded as belonging to both genres at once; any distinctions between the two, if there are any to be had, are not relevant for the purposes of this thesis.

<sup>358</sup> Kendall R. Phillips, *Dark Directions: Romero, Craven, Carpenter, and the Modern Horror Film* (Carbondale: Southern Illinois University Press, 2012), 5.

Furthermore, both films were part of a wave of 1950s remakes that occurred in the late 1970s and 1980s, which also featured such titles as *Invasion of the Body Snatchers*, and both are among the most prominent “body horror” films released in that period, as well as the two films Ernest Mathijs names “perhaps the most prominent” examples of how horror special effects became a defining genre element in the 1970s and ’80s.

Beyond being science-fiction, all four films are considered as falling under the purview of the horror genre. As Stephen Prince writes of the unique features of the genre, “only horror goes straight to the deepest unease at the core of human existence. And because it does so, the genre corresponds more profoundly with our contemporary sense of the world than do the others.”<sup>359</sup> With such a thought in mind, horror films can be particularly useful markers of public opinion, and specifically public fears, regarding contemporary events, including scientific discoveries and technological advancements.

### ***Who Goes There? – The Thing (1951) – The Thing (1982)***

#### *Who Goes There?*

John W. Campbell’s 1938 novella *Who Goes There?* has been adapted into two major films, the 1951 *The Thing from Another World* and the 1982 *The Thing*, the latter of which eventually spawned a prequel released in 2011, also entitled *The Thing*. As an author, Campbell was generally regarded as pro-science and pro-technology, once claiming that he specifically liked stories “in which the protagonist solves a technical problem through scientific or engineering training or outwits one or more aliens because humans are the toughest, smartest kids on the block.”<sup>360</sup>

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<sup>359</sup> Prince, Stephen. *The Horror Film*. “Introduction,” 3.

<sup>360</sup> Dennis Barbour, “The Evolution of *the Thing*,” *Popular Culture Review* (2011).

In the novella, a scientific expedition to the Antarctic discovers an alien lifeform frozen in ice. After some debate, the men bring the alien, which they believe to be dead, back to their base so that the camp biologist, Dr. Blair, can dissect it and collect samples for further study. Once thawed, the “Thing” proves to be both alive and incredibly dangerous, capable of perfectly assimilating and impersonating any other lifeform it encounters. The scientists scramble to find a way to determine who among them is still human and who has been replaced by a Thing. The hero of the story, camp meteorologist McReady, ultimately comes up with a solution in the form of a blood test. Nearly half the men fail and are revealed to be Things. One, mimicking Blair, nearly escapes, but the surviving scientists stop him in the nick of time, and the story ends triumphantly.<sup>361</sup>

*Who Goes There?* may display the heroics of (some) scientists, but the conflict between Dr. Blair and everybody else is almost as important to the narrative as the fight between man and Thing. In addition to insisting on bringing the alien back to camp, Blair participates in unleashing the creature, hacking away at the ice that encases it. As such, he actively helps create the problem that forces the story’s hero into action, a role traditionally filled by a villain. Furthermore, the Blair-Thing serves as the final monster the heroes must battle to save the rest of humanity from the alien threat.

In featuring both good scientists and evil scientists in prominent roles, the novella makes no overwhelming value judgements on either science nor scientists overall. On one hand, scientific curiosity in the form of Blair’s desire to investigate the alien’s anatomy catalyzes the story’s central problem. On the other, scientific ingenuity made possible through specialized knowledge is also what saves the day: Campbell makes a point of informing the reader that

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<sup>361</sup> John W. Campbell, “Who Goes There?,” in *Science-Fiction Classics: The Stories That Morphed into Movies*, ed. Forrest J. Ackerman (New York: TV Books, 1998).

McReady trained as a medical student before switching professions to meteorology and indicates that this training is what enabled him to come up with the blood test to distinguish between man and Thing. Overall, the novella suggests that while individual scientists (Blair) may go astray and present the risk of catastrophe, the scientific community at large can be trusted to counteract these threats before the general public is put at risk.

### *The Thing from Another World (1951)*<sup>362</sup>

The rise of alien invasion films in the 1950s did not occur spontaneously, but in the aftermath of multiple highly publicized UFO sightings that took place in the United States in the late 1940s. Kenneth Arnold reported sighting several crescent-shaped objects flying at great speed near Mount Rainer, Washington in June 1947, and reports of a flying saucer crash landing by an Air Force base in Roswell, New Mexico caught worldwide media attention the following year. Through the late 1940s and entirety of the 1950s, hundreds of UFO sightings were reported annually in the United States. In 1952, for instance, there was an average of four sightings reported per day.<sup>363</sup>

Regarding the status of science, as Melvin Matthews writes, “Both the atomic age and the flying saucer craze of the postwar era signified a popular unease about where science had brought humanity.”<sup>364</sup> And yet, amidst science-related scandals such as the Rosenberg trial, the 1950s were also an age of great scientist humanitarians like Jonas Salk, who developed one of the first successful polio vaccines. Science was at the center of popular news and culture to a degree that has never been repeated since, either the harbinger of doom or the savior of mankind,

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<sup>362</sup> Nyby, "The Thing from Another World."

<sup>363</sup> Melvin Matthews, *Hostile Aliens, Hollywood and Today's News: 1950s Science Fiction Films and 9/11* (New York: Algora Publishing, 2006), 11; Kendall R. Phillips, *Projected Fears: Horror Films and American Culture* (Westport: Praeger Publishers, 2005), 18.

<sup>364</sup> Matthews, *Hostile Aliens, Hollywood and Today's News: 1950s Science Fiction Films and 9/11*, 12.



depending on the story and the angle one happened to be facing. While the average American would be bombarded with messaging presenting both of these adamant and fundamentally contradictory views, including films that stood on both sides of the argument, no movie of the period really seems to acknowledge both these stances.

In the direct aftermath of World War II, there was a considerable incentive to justify and support the development of the atom bomb. However, as addressed in chapter one, after the Soviet Union detonated their own atomic bomb in 1949, criticisms of nuclear weapons that had been present in some small capacity since 1945 came rushing to the forefront as the possibility of an all-out nuclear war became increasingly real.

There were still both pros and cons—1951, the year *The Thing* was released, was also the year the first nuclear-powered generator started producing electricity—but public favor began to also sour against scientists, who, once again as previously addressed, had actually risen in popular opinion around the end of the war only to find that stardom quickly give way to suspicion. Ultimately, though, public opinion regarding science and its practitioners remained highly polarized, as can be seen from the two most iconic science-fiction films of 1951—*The Day the Earth Stood Still*, which lionizes the Albert Einstein-like scientist Professor Bernhardt as “the greatest living person,”<sup>365</sup> and *The Thing*, which critiques scientific reasoning in the dangerously shortsighted Dr. Carrington.

Howard Hawks was well established in Hollywood with such box-office hits such as *Scarface* (1932) and *His Girl Friday* (1940) already to his name by the time he optioned *Who Goes There?* through his independent production company Winchester Pictures. The filmmaker saw the skyrocketing popularity of science fiction magazines such as *Astounding Science*

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<sup>365</sup> Evans, *Celluloid Mushroom Clouds: Hollywood and the Atomic Bomb*.

*Fiction*, in which *Who Goes There?* was published, and had the foresight to realize the trend would catch on sooner or later at the movies, too. In a press release, Hawks noted:

The advent of this type of film opens a vast story market. Because the subject matter is involved with that which is unknown, science fiction stories permit the use of new and different plot structures in the writing of screenplays. Clever writing enables one to hold interest by the presentation of a scientific background which adds a lot of authenticity to the story as it progresses.<sup>366</sup>

He then elaborates that it is important that his film should not be mistaken for a “*Frankenstein* type of film”—an interesting comment for reasons that will be discussed later—and makes a point of emphasizing the “credibility” that will be bestowed on his film through “the use of scientific facts which parallel that which the viewer is asked to believe.” He also claims that “almost every Hollywood studio” has added science fiction titles to their production slates, and that this encroaching boom is a matter of acknowledging the “ever-increasing demand” demonstrated by the popularity of the sci-fi magazines.<sup>367</sup>

*The Thing* was not the first of these science fiction films to make it to screens. Kurt Neumann’s *Rocketship XM*, Mikel Conrad’s *The Flying Saucer*, and producer George Pal’s career-making film *Destination Moon* (all 1950), directed by Irving Pichel, made it to screens before *The Thing*—and the last in vibrant Technicolor. Still, *The Thing* is widely regarded as a “seminal” (Sobchack) science fiction film, and a trendsetter within the alien-invasion subgenre, “serving as something of a prototype” even though the actual arrival of the alien from space

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<sup>366</sup> George Turner, "The Thing from Another World: 1951's Prize Fight," *American Cinematographer*, January 1991, 35.

<sup>367</sup> *Ibid.*, 36.

occurs prior to the action of the film and is more of a prerequisite for the narrative than a central feature in itself.<sup>368</sup>

Though Hawks' predictions of a "vast story market" proved highly accurate, he took no part in it himself after *The Thing*, which remained his one and only science fiction title. While Christian Nyby is credited as the film's director, others who worked on the film reported it was Hawks who called all the shots, with the directorial credit mostly being an honorary title offered to Nyby as a token of thanks for his editing work on Hawks' earlier film *Red River*.<sup>369</sup>

Both Hawks and his hired screenwriter, Charles Lederer (*Kiss of Death*, *Gentlemen Prefer Blondes*) felt that the novella was too complex. Over a reported "half-dozen" drafts of the film, they moved further and further away from Campbell's original concept.<sup>370</sup> None of Campbell's characters ultimately remain in Hawks' film. Medical-student-turned-meteorologist McReady is swapped out for Air Force Captain Patrick Hendry—not a member of the Arctic research mission but sent to check in on them by a superior. The leader of the research mission, Noble laureate Dr. Carrington, accoladed for unspecified work in nuclear science ("the fellow who was at Bikini?"), is a clear proxy to Dr. Blair—the only clear proxy to any of Campbell's characters found in the film—and becomes Hendry's main adversary over the fate of the Thing. Otherwise, the most significant feature of the film that remains overwhelmingly true to the original story is the discovery of the alien ship buried in the ice.

However, once the Thing defrosts and wakes from hibernation, the nature of the ensuing monster hunt is drastically different. Early versions retained a monster similar to Campbell's, but Hawks and Lederer ultimately concluded that a metamorphosing alien was beyond their

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<sup>368</sup> Keith M. Booker, *Historical Dictionary of Science Fiction Cinema* (Scarecrow Press, 2010).

<sup>369</sup> On this subject, it is also worth noting that Hawks' name in the opening credits has a larger font size than Nyby's; Phillips, *Projected Fears: Horror Films and American Culture*.

<sup>370</sup> Turner, "The Thing from Another World: 1951's Prize Fight," 36.

technological capabilities and budgetary restrictions. Instead, they settled on a shuffling humanoid resembling the James Whale version of Frankenstein's monster cast in chrome, with the "exaggerated forehead, dark eyes, [and] cadaverous bone structure" and a staggering gait, that is fundamentally vegetal instead of animal ("an intellectual carrot, the mind boggles").<sup>371</sup> The ensuing monster hunt is therefore considerably streamlined compared to that of Campbell's novella, involving a clear distinction between "self" (humans) and Other (Thing). As Vivian Sobchack writes, "instead of the ambiguity of watching an alien walking around in human form, we have an extremely recognizable 'other,' something definitively detached from Man, something concretely different to be afraid of."<sup>372</sup>

In the film, Hendry's love interest, Dr. Carrington's secretary Nikki, comes up with the winning idea for destroying the alien—if it's a vegetable, "boil it"—though the cooking method that ultimately proves successful is electrical surge instead of hot water. One final major divergence from the novella takes the form of Ned Scott, a newspaper reporter who tags along with Hendry and delivers the film's closing monologue in a radio broadcast:

"One of the world's greatest battles was fought and won today by the human race. Here at the top of the world a handful of American soldiers and civilians met the first invasion from another planet. A man by the name of Noah once saved our world with an ark of wood. Here at the North Pole a few men performed a similar service with an arc of electricity. The flying saucer which landed here, and its pilot, have been destroyed, but not without casualties among our own meager forces. [...] And now, before giving you the details of the battle, I bring you a warning. Every one of you listening to my voice,

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<sup>371</sup> Skal, *Screams of Reason: Mad Science and Modern Culture*. P 206; Christian Nyby, "The Thing from Another World," (1951).

<sup>372</sup> Sobchack, *Screening Space: The American Science Fiction Film*, 23.

tell the world. Tell this to everybody wherever they are: watch the skies, everywhere.

Keep looking. Keep watching the skies!”

Whereas *Who Goes There?* ends on a note of reflection with a sense of containment—the public at large will never know how close they came to facing an alien invasion, and thankfully will never have to—*The Thing* ’51 ends by raising a public alarm.

Hawks and his producing partner, Edward Lasker, expected to have government assistance in the making of *The Thing*, including use of United States Air Force (USAF) personnel and equipment, as was relatively standard at the time, but their request was denied. Donald E. Baruch, the Pentagon’s principal liaison to the film industry, rejected the request on the grounds of the film revolving around flying saucers, as the Air Force “has maintained the position for some time that there are no such objects as flying saucers and does not wish to be identified with any project that could be interpreted as perpetuating the myth of the flying saucer,” going further to say that the Air Force “seriously objects” any mention or representation of the Air Force in the film at all, and ending with the vaguely threatening “we request every consideration be given to the Air Force objection in the interest of maintaining goodwill and relations.” In further negotiation, Baruch relented somewhat, offering support but only if the story was “presented as a dream.” Hawks and the studio refused, and so had to make the film without military support, which is decidedly ironic when one considers the significant pro-military subtext with which Hawks imbued his version of the story.<sup>373</sup>

In *Who Goes There?*, Dr. Blair is at the root of the alien problem. In *The Thing* ’51, a scientist, Dr. Carrington, is once again key in creating and exacerbating the extraterrestrial threat. But in Campbell’s version it is the scientific community, working collaboratively, that addresses

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<sup>373</sup> Turner, “The Thing from Another World: 1951’s Prize Fight,” 36-37.

and defeats the threat produced by one of its own; in *The Thing* '51 the military (Hendry) steps in to save the day, implying that the dangers presented by science must be negated by outside forces—specifically, military ones. While not all the other scientists are depicted as being as misguided as Carrington, they are shown as only being useful in the fight against the Thing as organized and utilized by Hendry. Hawks' film suggests that the best scientist is one who can be used like a tool by non-scientist others, whether that be to answer science-related questions when asked or apply their specialized skill sets as directed. In short, while scientists can be useful, their judgement cannot and should not be trusted, as they are “foolishly curious” and “their abnormal desire for knowledge dangerous to the whole human race.”<sup>374</sup> Carrington is the only scientist character who independently comes up with his own course and puts it into action, and these actions lead directly to the only human casualties in the film. The audience is introduced to Carrington as a lauded and accomplished member of the scientific community, but every single judgement call he makes in the film proves catastrophic.

While Nikki comes up with the idea of cooking the vegetable, it is a scientist—“the electrical specialist”—who actually sets up the trap that fries the Thing, but his contributions are minimized by the film, which does not deem his character notable enough to even be clearly named. Furthermore, his winning suggestion is only given after Hendry seeks out his expertise for another matter and then approves the scientist's request to propose an idea, showing deference to military authority.

Regarding the iconography and character of scientists in *The Thing* '51, while Carrington wears neither a typical lab coat nor glasses, he fits cleanly within the visual lexicon of a “mad scientist” in other ways. For instance, he is introduced in the way typical of 1930s mad scientists

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<sup>374</sup> Sobchack, *Screening Space: The American Science Fiction Film*, 23.

seen in films such as *Frankenstein* (1931), *Dr. X* (1932), and *Werewolf of London* (1935): another character (Hendry) is looking for him and is told he is in his laboratory, found at the bottom of a set of stairs—at the bottom of a descent, much like Hell or a dungeon.<sup>375</sup> And in this science-dungeon, chock full of cross-disciplinary science paraphernalia, Carrington is first seen staring into a piece of equipment, gathering data, only coolly acknowledging Hendry’s presence after his acknowledgement is directly requested. In this first shot of Carrington, he is shown with his back to camera, indicating his unsociable nature, and while the radar device he uses associates him most firmly with physics, the shot also features a periodic table (chemistry) in the background and a microscope (biology) in the foreground, and therefore associates him with these other sciences as well.

The stereotypical white lab coat and glasses of the movie scientist do not just allow the audience to immediately pin the character within a framework well established by Dr. Frankenstein and colleagues, but also function as a mark of Other-ness, a uniform that separates scientists from “normal” people. Though he may lack these traditional markers, Carrington’s difference is visually indicated in other ways. With his greying hair and beard, he contrasts with the otherwise youthful and clean-shaven group. This is worth particular emphasis as the actor portraying Carrington, Robert Cornthwaite, was only 34 at the time—the same age as Kenneth Tobey, who played Hendry, and seven years younger than Ned Scott actor Douglas Spencer—and had to undergo significant age makeup in order to achieve this look.

There is also at least one homage to the most famous mad scientist of all: the scene where Carrington observes the severed Thing hand. On the table, the hand begins to move—Carrington’s dictated note is that “the hand became alive”—a clear parallel to the iconic birth of

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<sup>375</sup> This is particularly odd in context, as elsewhere the laboratories at the research site appear to be level with the hallways.

Frankenstein's monster scene in James Whale's *Frankenstein*, where Henry Frankenstein notices the twitching hand of his creature and shouts, "it's alive!"

As far as how Carrington fits within the archetype of the "mad"—more accurately, inhuman—scientist as a character, he embodies several key characteristics of this trope:

1. He is sexually dysfunctional. Within the archetype, this characteristic tends to manifest in one of two ways: staunch asexuality or unrequited sexual obsession. Carrington is the former, and openly disparaging of those who are not, repeatedly attributing the Thing's superiority to its asexual reproductive cycle, free of physical or emotional intimacy.
2. He demonstrates a total lack of social skills. Carrington never speaks *with* people, he lectures *at* them. This distinction is particularly noticeable in the context of the quippy, overlapping dialogue for which Hawks' films are known; Carrington never engages in this sort of conversation—he is fundamentally incapable of it, as he has no sense of humor.
3. He shows an utter disregard for the value of human life. It is not simply that Carrington does not see the threat presented by the Thing, but that he does not care if it is dangerous.

Beyond Carrington, most of the other scientist characters are largely interchangeable and indistinguishable, bodies in a room or bit players with one scene to shine. The only other scientist with a consistent presence throughout the film is Dr. Chapman, Hendry's greatest ally among the scientists. He is also notably the least "scientist-like" scientist—he is never shown working in a lab or doing science work in the field; furthermore, he is the only scientist who is not only confirmed to be married but have a spouse present at the research base; in fact, Chapman appears on screen directly *after* his wife is introduced.



As addressed previously, sexual dysfunction and a retreat from social company—and female company in particular—are a staple of mad scientist narratives well established in 19<sup>th</sup> century publications ranging from *Frankenstein* to several works of Nathaniel Hawthorne. With this in mind, the presence of Mrs. Chapman, brief though it proves to be, is significant in distinguishing Dr. Chapman as a breed apart from the “mad scientist” mold. Furthermore, it is worth noting that, based on his role in the film, it is actually quite possible that Chapman might be the camp physician instead of a research scientist.

Collectively, the scientists in the film are depicted as inept and generally incapable of handling their own affairs. Scientists are collectively described as children in not one but two separate scenes throughout the film—once by Hendry and once by Nikki—and the film implies that much like children, scientists require monitoring and discipline from more sensible (non-scientist) authority figures for the safety of both themselves and others.

While the shortcomings of Blair and Carrington are largely the same, Blair’s dangerous faults reflect back only on him as an individual. All of these traits dangerously connected to the destruction of self and others as seen in Carrington are indicated as being emblematic of scientific reasoning. Whereas Blair is simply *a* scientist, Carrington is introduced as a revered member of the scientific community, and therefore an embodiment of what that community represents. That he should be interpreted thusly is emphasized through the film describing him as not just the winner of the Nobel prize, but the recipient of “every kind of international kudos a scientist can attain.” The nature of the work that won him this honor is never specified, though perhaps in nuclear physics, as the discussion in the opening scene describes him as “the fellow who was at Bikini”; still, the point of bringing up the award is to indicate that he is not a renegade or rogue agent, but emblematic of a larger scientific way of thinking and set of

standards. He is he not just a member of the group known as “scientists,” but an exemplary member, singled out for his achievements. That Carrington represents a general critique of a scientific mindset in a way Blair does not is also emphasized in how *The Thing*, as mentioned, features a scientist prominently as an antagonist but not a protagonist, unlike in Campbell’s version.

In a 2011 article for *Cineaction*, Tony Williams claims that, “As anybody who has seen the film will know, *The Thing* does not fall into the characteristic anti-intellectual Cold War opposition between military and mad scientist, but presents unified mobilization against a dangerous threat facing everyone, one in which all representatives of the community [...] become involved.”<sup>376</sup> However, a glance through the literature that has been written in the six decades since the film’s release will reveal that this claim is decidedly inaccurate. For one, the “mad scientist” aspect Williams claims the film lacks was apparent enough to contemporary viewers to make the headline of the *Chicago Tribune*’s review of the film: “Mad Scientist Goes Modern in this Movie.”<sup>377</sup> Furthermore, as also mentioned previously, Carrington aligns himself with Dr. Frankenstein at least once throughout the course of the film. While some of the scientists are on Hendry’s side, they are consistently depicted as the exception, not the rule. Carrington, who the films sets up as a paragon of scientific values, is the rule. As addressed in Chapter 1, disaster-driven interactions between scientific and military parties are a common feature in 1950s sci-fi films, and when these interactions are antagonistic one party plays the role of villain and the other the role of hero. As Bruce Kawin writes, *The Thing* posits the army as

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<sup>376</sup> Tony Williams, “Encountering the Thing from Another World,” *Cineaction* 84 (2011).

<sup>377</sup> Mae Tinée, “Mad Scientist Goes Modern in This Movie – “the Thing”,” *Chicago Daily Tribune*, June 11, 1951.

being in the right while “the scientist is an obsessive visionary who gets in the way of what obviously needs to be done.”<sup>378</sup>

That the military must be called in to control the situation, and that the reporter brought in to share the story with the general public never speaks with Carrington and therefore does not let him participate in the shaping of the narrative, iterates and reiterates that scientists lack the judgement to moderate their own work. Monitoring and intervention from outside sources—the military first, the media second—is needed to keep them in check, for fear of “Things” being let loose. In *Who Goes There?*, scientists can solve problems just as well as they create them, in *The Thing* ’51, they only create them.

### ***The Thing* (1982)<sup>379</sup>**

*The Thing* ’82 draws far more closely on Campbell’s short story than *The Thing* ’51, and looking specifically at what it emulates, and indeed what it does not, demonstrates a particular methodology.<sup>380</sup> John Carpenter’s remake takes most of the narrative components that Hawks’ version left on the cutting room floor, while omitting those elements of the original story that the earlier film did include. The scene in which the researchers find the Thing frozen in ice, which features prominently in Hawks’ film and is among the scenes in the film that correspond most closely to Campbell’s novella, is not just omitted from *The Thing* ’82 but rendered irrelevant, as the American research team does not discover the Thing—it discovers them.

After a brief opening shot of a flying saucer crashing to earth and a title card styled in homage to Hawks’ film, *The Thing* ’82 begins with a chase sequence of a helicopter pursuing a dog across a frozen Arctic landscape—the helicopter manned, as the film will reveal in time, by

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<sup>378</sup> Bruce Kawin, "Children of the Light," in *Shadows of the Magic Lamp: Fantasy and Science Fiction in Film*, ed. George Slusser and Eric S. Rabkin (Carbondale: Southern Illinois University Press, 1985), 21.

<sup>379</sup> John Carpenter, "The Thing," (Universal Pictures, 1982).

<sup>380</sup> Prince, "Dread, Taboo, and *the Thing*: Towards a Social Theory of the Horror Film," 123.

the last surviving members of the Norwegian research team that discovered the alien in a manner in keeping with the earlier versions of the tale, and the innocuous looking dog none other than the Thing. Enough of the details surrounding the original discovery of the alien are left to the imagination to entirely remove, or at the very least strongly diminish, any link between the threat posed by the Thing and scientific curiosity.

In spite of this drastic change in inciting incident and the introduction of the monster, the major plot points of Carpenter's film generally line up well with Campbell's story—until the ending, which diverges sharply. The shape-shifting monster of the original tale is restored and rendered with horrific aplomb, with the metamorphosing, tentacled creature aligning not always, but quite often, with descriptions from the novella, such as “the Thing screamed in feral hate, a lashing tentacle wiping at blinded eyes,” and, in the case of a blood sample that failed the “Thing test,” the blood “shrank from the hot platinum wire, and struggled to escape the tube [...] the Thing in the test-tube screamed with a tiny, tinny voice.”<sup>381</sup>

The human characters and group dynamics also bear much greater resemblance to Campbell's version than Hawks, including in name. A biologist named Dr. Blair features in *The Thing* '82, portrayed by Wilford Brimley (from here on, Brimley-Blair). Early in the film, his role is far more passive than that of his novella counterpart (novella-Blair) or Dr. Carrington due to the different manner in which the Thing is introduced, as discussed earlier. After that, however, he does follow the same narrative beats as his novella counterpart, including a mental breakdown sparked by his realization of the Thing's potential to spread exponentially—each Thing cell is independently viable, and capable of separating and multiplying to mimic another being of any given size—and subsequent holding in isolation that culminates in a final

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<sup>381</sup> Campbell, "Who Goes There?," 438, 441.

showdown between the human survivors and a Thing mimicking Blair, attempting to escape in a spaceship constructed of scavenged parts. While Brimley-Blair follows the novella Blair's narrative arc quite closely, his characterization is notably distinct from Campbell's version of the character, overall bearing less resemblance to either earlier version of the character than Carrington and novella-Blair do to each other.

Specifically, the biologist in Carpenter's film remains a more empathetic figure than his earlier counterparts in several key regards. First and foremost, he does not actively fight for the dissection of the Thing, but is instead instructed by mission leader Commander Garry to "start an autopsy, right away." Brimley-Blair does as commanded, but he is just as disgusted and unsettled by the alien creature as all the other men at the research base. He performs the task with none of the relish displayed by novella-Blair or Dr. Carrington. Judging from the footage retrieved at the Norwegian camp, the Thing *was* unearthed by a scientific expedition, but this element of the narrative is once removed and somewhat obscured—it is not science that brings the Thing to US Station 4, but pure happenstance.

Looking to the other characters, the protagonist of *The Thing* '82 is once again named MacReady—now with an extra "A"—but looking to *Who Goes There?*, Kurt Russell's MacReady (Russell-MacReady), a pilot, is most accurately described as a fusion of McReady and Van Wall, a supporting pilot character from the novella. While Russell-MacReady still plays largely the same role within the narrative as McReady—he takes charge of the mission after the original leader, Commander Garry, steps down and eventually comes up with the successful human/Thing blood test—he is presented as having no scientific background. While the novella emphasizes McReady's medical school experience in how he manages to come up with the idea for the blood test, the film indicates MacReady comes up with the idea through sheer ingenuity.

*The Thing* '82 on the whole sees no value in specialized knowledge, and therefore scientific training. Scientific curiosity, training, and specialized knowledge are not suggested to be fundamentally immoral or dangerous to society, as they are in *The Thing* '51, just not particularly helpful or, at worst, mildly harmful to one's self. As described by Stephen Prince, cinematic horror on the whole depicts a breakdown of boundaries and structures that form the basis of both society and the self: "The horror film may be regarded as a visualization of the dialectic between linguistic and socially imposed systems of order and the breakdown of those systems through their own contradictions."<sup>382</sup> In *The Thing* '82, scientific curiosity is not the source of horror, but as Prince goes on to state in his own analysis of the film, with Brimley-Blair's breakdown in the face of the "epistemological and material" threat posed by the Thing, "science capitulates first, becoming not the manifestation of the careful work of a disciplined team but the blind rage of a man who would be a mass murderer."<sup>383</sup> Brimley-Blair studies samples collected from the Thing in his laboratory, presumably to better understand the alien threat and therefore make it less frightening, but instead what he finds—a considerable threat to humanity worldwide, as the model he runs on his computer concludes—causes him to crack and act out irrationally, thinking to murder all his other team members to eliminate the alien threat.

Elsewhere in the film, another attempt to utilize specialized knowledge and training, in this case medical, backfires when camp physician Dr. Copper's attempt to resuscitate Norris leads directly to the doctor's death. The prone man turns out to be a Thing and not a heart attack victim, as the doctor had resumed. Norris's chest gives way underneath the defibrillator paddles,

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<sup>382</sup> Prince, "Dread, Taboo, and *the Thing*: Towards a Social Theory of the Horror Film," 122.

<sup>383</sup> *Ibid.*, 126, 127.

opening up into a yawning chasm that promptly snaps shut like a bear trap. Copper finds both his arms severed for his efforts.<sup>384</sup>

MacReady is depicted as an exceptionally good survivor, and what sets him apart from the crowd is a mixture of ingenuity and practically preternatural instincts—for instance, when he somehow becomes suddenly aware there is trouble in the kennels whilst in the kitchen, seemingly not needing to see or hear anything out of the ordinary to somehow just *know* something is amiss—two skills which cannot be taught in school. Science is neither fundamentally good nor evil so much as relatively unimportant, and therefore so are scientists. Whereas *The Thing '51* turns Campbell's pro-science stance on its head, *The Thing '82* takes the novella's plotline and either dilutes the scientific themes or scraps them entirely.

“The Fly” – *The Fly* (1958) – *The Fly* (1986)

**“The Fly”**

George Langelaan's short story “The Fly” was first published in the June 1957 issue of *Playboy* magazine, known in these early days as much for publishing “high level” science fiction stories as well as its depictions of female nudity.<sup>385</sup> Told from the first-person perspective of French industrialist François Delambre, it recounts events surrounding the death of his brother André, whose wife, Héléne immediately admits to murdering him but refuses to give up any further details about the killing. She is declared insane and sent to a sanitarium. Eventually, Héléne reveals everything in a confession letter she entrusts to François: André, a scientist

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<sup>384</sup> Furthermore, it's worth noting that Blair's “lab work” appears to involve loading a sample into a computer model that both creates and analyzes that data for him; as depicted in the film, being a scientist does not require specialized knowledge so much as it does the use of specialized tools.

<sup>385</sup> Brode, Douglas. *Fantastic Planets, Forbidden Zones, and Lost Continents: The 100 Greatest Science-Fiction Films*; U of Texas Press, 245.

financed by the Air Ministry, had been obsessively pursuing a dangerous line of research in secret, culminating in the invention of a matter transmitter.

After a series of test runs involving an ashtray and the family pets, André tested the machine on himself and ended up mashing himself with a fly that had also been hiding in the transmission chamber. Horrified, André, now with a human-sized fly head and fly leg in place of an arm, recruited Hélène to try to find the fly (with a fly-sized human head and arm), hoping that re-transmitting himself and the fly might unscramble them. Her search turned up empty-handed, and André, refusing Hélène's suggestion of seeking help from other scientists or medical professionals, turned to suicide, convincing his wife to help him crush himself under a steam hammer, destroying the evidence of his misbegotten invention. After reading the confession, François turns it over to the police, who inform him Hélène has committed suicide and dismiss the contents of her confession as proof of her insanity. By chance, François stumbles upon the fly with his brother's face and arm caught in a spider's web and kills it.

### ***The Fly (1958)***<sup>386</sup>

As Jackie Stacey writes, *The Fly* '58 was "perhaps the first film to explore the mixing of human and nonhuman molecules using technical experimentation."<sup>387</sup> To put into context, the film, which came just a year after the publication of Langelaan's story, was released just 14 years after Oswald Avery, Maclyn McCarty, and Colin MacLeod demonstrated that DNA housed the genetic material of the cell and a mere four years after James Watson, Francis Crick, Maurice Wilkins, and Rosalind Franklin discovered the DNA double helix.<sup>388</sup>

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<sup>386</sup> Kurt Neumann, "The Fly," (20th Century Fox, 1958).

<sup>387</sup> Jackie Stacey, *The Cinematic Life of the Gene* (Duke University Press, 2010).

<sup>388</sup> Bernard D. Davis, *The Genetic Revolution: Scientific Prospects and Public Perceptions* (Baltimore: Johns Hopkins University Press, 1991).



In terms of relation to literary source material, Kurt Neumann's *The Fly* is the most faithful adaptation of the four films discussed in this chapter. The setting is switched from France to Canada, but the only character name changed is that of Hélène and André's son, who is here called Philippe instead of Henri. The order in which the events that take place on the night of André's death are revealed is somewhat swapped—the short story begins with François receiving a telephone call about his brother's death and then follows him to the scene of the crime while the film opens at the Delambre factory with a night watchman discovering André's corpse and then cuts to François receiving a call—but the events themselves play out as described in Langlaan's story.

*The Fly* '58 moves André's laboratory from an abandoned backroom of the family factory to the basement of his home, aligning him more firmly with the mad scientist archetype codified in the 1930s. While a connection between his research and the Air Ministry is mentioned, it is minimized in the film in comparison to the short story. While various characters only vaguely mentioned in the short story (e.g. a nurse who swats a fly, sending Hélène into hysterics) are given expanded roles in the film, the Air Ministry and its representatives remain passing mentions; as such, while the 1950s sci-fi trend of depicting government/military-scientist connections is technically followed, it is a peripheral feature instead of being of central importance. Overall, in the film's focus on an isolated scientist working in a basement and its general sense of containment, with the monster-victim first and foremost a danger to himself and the sanctity of his family, *The Fly* '58 is more akin in its narrative form to a 1930s mad scientist horror film than any of the major trends present in 1950s science fiction film.

The basic trajectory of André's story remains the same as in Laangelan's original, though in the film far more emphasis is given to the (supposed) happiness of his and Hélène's marriage

prior to his fateful experiment. The biggest addition to the narrative comes in the form of a pseudo-love triangle between André, Héléne, and François—François is in love with Héléne and has been for many years, but she does not know (presumably, André did not either); he stepped aside when her feelings for his brother became clear and has admired her from a distance ever since. Again, this modification most strongly echoes mad scientist films of the 1930s, where such a dynamic was a reoccurring trope seen in films such as *The Werewolf of London* (1935) and *The Invisible Ray* (1936). Particularly after 1934, when the morality-minded production code began to be enforced more vigorously, Hollywood films were carefully monitored and nitpicked for any content that could be considered morally objectionable. As the mad scientist is a fundamentally amoral figure, these films had to demonstrate a functioning moral compass through having their central madman meet a fitting end (almost always death). But in addition to depicting wrongdoers being punished for their crimes, mad scientist films, with almost no exceptions, also feature at least one morally upstanding character who is conversely rewarded for their good deeds before the end credits roll, and overwhelmingly that reward is the usual Hollywood prize of “getting the girl,” so to speak.

Of course, this requires there being a woman present, and in 1930s mad scientist films two of the most frequent categories of love interests are scientists’ daughters—usually daughters of the mad scientist’s colleagues as opposed to the villain himself<sup>389</sup>—and the neglected mad scientist’s wife (as discussed in the context of Dr. Carrington, mad science, sex, and romance never make for happy bedfellows). In such scenarios, like the two films mentioned earlier, the miserable spouse shares a mutual attraction with a morally upstanding man, but as she is a morally upstanding woman, the two yearn from afar while she suffers her unfortunate

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<sup>389</sup> See: *Doctor X* (1932), *The Invisible Man* (1933)

matrimonial circumstances with nary a complaint. Eventually, though, her husband gets his comeuppance for his misdeeds, freeing her to follow her heart.

There are enough similarities to warrant comment, but it must be noted that *The Fly* '58 does not follow this formula exactly. Hélène actually does want André's attention and affection, her issue is that she has to compete with his science experiments for it and quite often loses the battle; she has no desire to be rid of him until after she sees what he has become after his accident, at which point she switches to calling him a "thing." While she appears fond of François, whether or not that fondness could grow into something more on her part is never addressed explicitly, though the film's final scene in which she, son Pierre, and François look every bit the picture of a perfect nuclear family, strongly suggests this possibility.

In the film, François' secret love of Hélène is introduced before André finally shows up on screen—or, more precisely, André as a living man as opposed to a mutilated corpse—which does not happen until nearly thirty minutes into the film's runtime, when Hélène's flashback begins. André is first shown in the living room of his home, playfully interacting with his wife and child.<sup>390</sup> But it is a momentary respite; he has something he wants to show Hélène down in his laboratory—a "disintegrator-reintegrator" capable of transmitting matter.

To place greater emphasis on the Delambres' presumed marital bliss, the nondescript ashtray André uses to demonstrate his machine to Hélène in the short story becomes instead a plate received as a wedding gift, complete with anecdote. André's dreams for his "disintegrator-integrator" are much the same as in the story as well, although bestowed with an extra philanthropic flare. Not only will his teleporters replace all other forms of transport for goods

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<sup>390</sup> Notably, this is the only time in the film he is seen interacting with his child.

and people, but they will mean “there will never be a need of famine—surpluses can be sent instantaneously at almost no cost, anywhere. Humanity need never want nor fear again.”

When police suggest to François that Héléne and André might have had marital troubles leading up to his brother’s death, he adamantly refuses to believe it, insisting that “André loved two things: his family and his work.” However, while Héléne’s flashback indicates she genuinely did love her husband, it also demonstrates that of André’s two loves, she played second fiddle. After André teleports the wedding plate to demonstrate his invention to his wife, she discovers a flaw in his invention—the machine has scrambled the letters in the “Made in Japan” label on the back of the plate; as soon as she shares this information with him, he turns his back on her, refusing to so much as acknowledge her existence—or her repeated attempts to get his attention—as he returns to scrutinizing his notes.

André isolates himself in his lab, ignoring his wife and children in his search to fix the flaw Héléne found. It takes weeks but eventually he figures it out. Flush with victory, an opportunity to move on to a new round of tests presents itself in the family cat, Dandelo, who presumably stops by in search of affection or perhaps some milk but instead gets disintegrated-reintegrated—or, more accurately, disintegrated, as the cat never reappears. Before experimenting on the cat he stares at it for a long while, suggesting an internal struggle. Namely, that André knows he should not do it, but ultimately cannot keep himself from succumbing to the temptation.

While André does appear quite anguished once he realizes what has become of the cat, the scene then fades to black, with the next scene, presumably some days later, featuring a frazzled Héléne on the telephone mentioning, among other things, about how Phillippe has been acting up over his missing pet and how André has shut himself up in his lab again. Only here

comes André now, happy and sociable once more, with promises of a nice dinner out and opera tickets—he's in a celebratory mood. But even at the opera, André's thoughts end up drifting back to his laboratory; he ends up scrawling formulas on his program, much to Hélène's displeasure. André is not merely besieged by obsessive tendencies, he is characterized like an addict, and science is his drug of choice.

After the opera, André brings Hélène down to his laboratory again to show her what exactly has put him in such a celebratory mood. After some significant flirtation that strongly implies the couple, for whatever faults their relationship may have, are sexually compatible—as Bill Warren notes, “unusual in science fiction films”—when André can be lured away from his experiments, that is. André demonstrates his newly improved disintegrator-reintegrator by transporting a bottle of champagne and then a guinea pig.<sup>391</sup> Hélène, who had previously regarded the machine first and foremost with wonder, quickly balks at the idea of testing live subjects. While she ultimately does not try to stop her husband, she watches the animal demonstration from across the room instead of standing by his side, as she had previously. After the successful transmission of the critter her rebukes soften somewhat, although she remains clearly concerned, and these qualms are most certainly not assuaged when her husband proceeds to reveal in a distinctly offhand manner what became of the family pet, referring to it merely as his first unsuccessful test subject and then letting Hélène put two and two together.

She calls his invention “frightening” and warningly compares it to “playing God”—once again, this particular phrasing has much stronger connections to 1930s movie scientist trends than 1950s ones—but André vehemently disagrees with her, stating that “God gives us intelligence to uncover the wonders of nature,” and, as such, would hardly see fault in his

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<sup>391</sup> Warren, *Keep Watching the Skies! American Science Fiction Movies of the Fifties*.

uncovering of these wonders. However, the film, much more so than the short story, sides firmly with H el ene in this regard. “Oh Andr e, I get so scared sometimes, the suddenness of our age. Electronics, rockets, earth satellites, supersonic flight, and now this,” she says, “it’s not so much who invents them, it’s the fact they exist”—a line which basically serves as the film’s thesis.

When Andr e’s accident occurs and H el ene first sees his mutated fly arm, the film emphasizes horror and disgust in her reaction more than fear, having her scream at the sight of her husband’s transformed arm (and then later, his face) instead of burst into tears. One of the two clearest indications of the film’s staunch alignment with H el ene in comparison to the short story, which treats her quite dismissively, comes along when, much like in the original, she desperately pleads with Andr e to try going through the disintegrator-reintegrator again—even though they have not found the fly that has Andr e’s face and arm—a distinctly irrational notion, but one that Andr e humors anyway. However, unlike in the short story, her attempt does not make Andr e’s condition worse by introducing Dandelo molecules into the mix, turning the scientist into an even more woeful human-fly-cat chimera, it merely fails to fix the existing problem. However, it is only after Andr e steps out of the teleporter following this last-ditch attempt that H el ene finally removes the cloth sack covering his face seeing his fly-head for the first time (she screams and faints).

While in Langelaan’s story, Andr e’s deformities appear fundamentally cosmetic, in the film it is indicated that he is also gradually losing his mental capabilities. After seeing what has become of his face, and his diminishing mental capacities evidenced by perhaps one of the most dramatic chalkboard writing scenes to ever grace cinema, H el ene becomes convinced to help Andr e commit suicide—though, as she repeatedly protests, this fly-man is not her husband, but a “thing,” and it is “not wrong to kill a *thing*.”

The second indication of the film's alignment with H el ene comes in the form of the changes it makes to the ending. Unlike in Langelaan's story, H el ene does not commit suicide. Instead, she gets a happy-ish ending which strongly suggests a future romance with her brother-in-law—a man who loves her and who will not require her to compete with science for his affection. However, just before H el ene, Fran ois, and Phillippe walk off into the sunset comes the most (in)famous scene in the film, in which Fran ois and the police inspector stumble upon the human fly that evaded H el ene for so long, trapped in a spider's web, about to become said spider's lunch. The two men stare in horror for a several seconds as the Andr e fly struggles, screaming "help meeee!," until the policeman cannot take the screeches any longer and crushes the miserable creature with a rock. While movie mad scientists overwhelmingly end up dying as recompense, Andr e is unique in that he suffers not one but two gruesome death scenes before *The Fly* comes to an end.

While many of the of the narrative tropes present in the film bear the greatest resemblance to cinematic trends from the 1930s, there is one major regard in which *The Fly* fits cleanly within its late 1950s context, and that is its depiction of the scientist as a helpless figure. In early 1950s films, scientists frequently contribute to creating whatever problem it is that the film's heroes must face, whether that be an alien on the loose or a swarm of giant insects, but they were also not merely capable, but almost always necessary, to solve whatever problem they helped create. As mentioned, even in *The Thing '51*, which features military man Hendry as the hero and posits chief scientist Dr. Carrington as a villain, it is the nameless "electrical specialist" who rigs the trap that ultimately kills the alien invader. But by the mid-1950s, more and more science-fiction films begin to doubt the ability of scientists to clean up their messes, as seen in films such as *The Fly* and *The Incredible Shrinking Man* (1957), in which scientists, for all their

efforts, are not able to reverse or even halt protagonist Scott Carey's shrinking away to nothing, a condition caused by accidental exposure to nuclear radiation and a subsequent, equally accidental, spraying with pesticides.<sup>392</sup>

Aesthetically, *The Fly* also shows particular indications of its late 1950s release date. Science fiction films from earlier in the decade largely take their cues from film noir—overwhelmingly black-and-white and featuring stark, high-contrast lighting—with the notable exceptions of George Pal's films (*Destination Moon*, *The War of the Worlds*, *The Naked Jungle*, *Conquest of Space*) and MGM's *Forbidden Planet* (1956). The timing, along with the particular emphasis on the brilliant-red blood at the scene of the crime, suggests the possibility that the visual style of *The Fly* was influenced by the international success of *The Curse of Frankenstein* (1957). Andrew Tudor's observation that *The Fly* '58 was the first mad scientist film released in color and CinemaScope produced by a major Hollywood studio further supports this possibility.<sup>393</sup>

André's narrative arc still overall most strongly resembles that of a 1930s mad scientist: he is warned about playing god, does anyway, and eventually realizes the error of his ways—but it is too late, and he dies as a consequence of interfering with things that should not be interfered with. Admittedly, he is treated with more sympathy than the typical crazed experimenter of the 1930s. When Phillipe asks his uncle in the coda about why his father died, François tells him it was “because of his work,” but then also goes on to laud the importance of that work, calling it “searching for the truth,” which he then goes on to describe as “the most important work in the whole world, and the most dangerous.” Phillipe claims that he would like to follow in his father's

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<sup>392</sup> Jack Arnold, "The Incredible Shrinking Man," (Universal Pictures, 1957).

<sup>393</sup> Tudor, "Seeing the Worst Side of Science," 591; some might argue that *Forbidden Planet* actually holds this honor, but Dr. Morbius is a PhD in philology and therefore is an academic but not a scientist.



footsteps, and neither François nor Hélène show any indication of disapproval at this pronouncement.

Though horrifying conceptions of human-animal hybrids already had a long history—most famously, *The Island of Dr. Moreau*, filmed in the classical horror period of the 1930s as *The Island of Lost Souls*—previous human-animal chimeras were the result of surgical efforts. André’s fusion with fly represents something unique in the sense that it occurs at the molecular level *and* that it occurs by accident, as the animal-human hybrids of mad scientist films from past decades were overwhelmingly intentional creations.

In contrast to other movie mad scientists that had appeared on screen by the time *The Fly* was released, André is unusual in that he is presented as an “altogether decent” sort, with the picture painted by the Delambre family at the start of the film “stereotyped, but it’s a different kind of stereotyping than we are used to in science fiction films.”<sup>394</sup> Even though the façade of André as a loving family man is ultimately pulled back to reveal a number of familiar mad scientist tendencies, his romantic nature still makes him something of an anomaly among the scientists of the 1950s science fiction film boom—compare, for example, Dr. Carrington and his admiration of the “superiority” of the vegetal Thing—but it’s not really a departure from the mad scientist archetype so much as a callback to a bygone era. Regarding Shelley’s novel, Roslynn Haynes notes, “Frankenstein is simultaneously both the scientific rationalist and passionate idealist.”<sup>395</sup>

Ultimately, that André appears different from the typical scientist character proves more of a red herring than an actual departure from the norm. Considering that both the original short story and especially the Neumann film were crafted firmly within the Cold War era, the fear of

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<sup>394</sup> Warren, *Keep Watching the Skies! American Science Fiction Movies of the Fifties*

<sup>395</sup> Haynes, *From Faust to Strangelove: Representations of the Scientist in Western Literature*.

espionage, of people not being who they appear to be, is highly relevant, particularly with regards to scientists; the conviction of physicist Karl Fuchs for passing along atomic secrets to the USSR in 1950 lead to the infamous trial and ultimate executions of Julius and Ethel Rosenberg. That a mad scientist could appear in the guise of a normal, loving husband and father not only feeds into the same base stereotype, but adds a new twist by indicating that this threat could present itself under a seemingly benign guise. This concept of false pretense is especially relevant to *The Fly* considering author George Langelaan was himself a spy in World War II.<sup>396</sup>

### *The Fly* (1986)<sup>397</sup>

In looking at depictions of scientists, the films of David Cronenberg are particularly intriguing to study as he is one of a relatively small number of filmmakers who once considered pursuing a career in the sciences. Cronenberg found himself interested in science, particularly biology and chemistry, from a young age. “I was fascinated by the way that people dig around to discover how things work, and the way they codify and organize that knowledge,” he writes in *Cronenberg on Cronenberg*, “I interpreted that interest to mean that maybe I should be a scientist.” When he started university, he found himself facing a “very schizophrenic future,” split between his interests in science and literature. He actually entered focusing on science—“I thought you couldn’t be taught how to write, but you needed to be taught science”—but once actually at the University of Toronto found he was spending far more time on “the arts end of campus,” and switched gears late in his first year.<sup>398</sup>

Fox Studios hired Edward Pogue to script the remake of *The Fly*, but Cronenberg later came on board with a different vision in mind, leading to extensive rewrites. Two key elements

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<sup>396</sup> Bruce Clark, “Mediating the Fly: Posthuman Metamorphosis in the 1950s,” *Configurations* 10, no. 1 (2002).

<sup>397</sup> Cronenberg, “The Fly.”

<sup>398</sup> *Cronenberg on Cronenberg* (London: Faber and Faber, 1992).

from Pogue's original script that differ from previous versions of *The Fly* that made it to David Cronenberg's finished film include the idea that the scientist's monstrous transformation being gradual instead of immediate, and the scientist's love interest—Veronica (Geena Davis), the scientist's girlfriend, not wife, in this case—realizing that she is pregnant with a baby that may also potentially be a monster.

While *The Fly* '58 waits over half an hour to introduce its ill-fated scientist, *The Fly* '86 takes mere seconds to introduce Seth Brundle. A close-up of his face is the second shot in the entire film and he delivers the first line: "What am I working on? I'm working on something that'll change the world and human life as we know it." The setting is a gala hosted by his employer, Bartok Industries, and in the middle of an interview with *Particle* magazine reporter Veronica Quaife. When she expresses doubt at his grand proclamations, he awkwardly invites her back to his apartment-laboratory ("Somehow I get the feeling you don't get out much," she tells him), so she can see what he's working on for herself. After some coaxing, she finally agrees to go with him.

*The Fly* '58 introduces what appears to be an admirable, affectionate family man and then gradually reveals him to be a mad scientist; *The Fly* '86 does more or less the exact opposite. While Seth may not be introduced in a lab, he very strongly comes across as a mad scientist type from the first scene, with his grandiose statements about changing the world and evident lack of social skills, particularly when it comes to speaking to a woman. He also looks the part in spite of not wearing a lab coat, with his frizzy, somewhat unkempt hair that puts him midway between a Byronic hero and Rotwang/Einstein, and slightly bug-eyed gaze.

Cronenberg's film takes the approach that in order to move beyond the "mad scientist" archetype it must first confront it. When Margaret Mead first published "The Image of the

Scientist among High-School Students” in 1957, she presented a series of “composite statements” pieced together from numerous recurrent phrases from student responses. Overall, she found across the responses a predominant shared image of a scientist as “*a man who wears a white coat and works in a laboratory,*” specifically “*elderly*” or “*middle aged*” and “*wears glasses.*” Someone who is either “*small*” or “*tall and thin,*” who quite likely either “*wears a beard*” or is “*unshaven and unkempt*” and is surrounded by an eclectic hodgepodge of scientific instruments.<sup>399</sup> From there, she splits her composite into two, the positive and the negative. The positive image is one of intelligence and dedication to the edge of self-sacrifice to work done in the pursuit of advancing and bettering the human condition; while on the negative side there is:

*“The scientist is a brain. He spends his days indoors, sitting in a laboratory, pouring things from one test tube into another. His work is uninteresting, dull, monotonous, tedious, time consuming, and, though he works for years, he may see no results or may fail, and he is likely to receive neither adequate recompense nor recognition. He may live in a cold-water flat; his laboratory may be dingy. [...] He is a brain; he is so involved in his work that he doesn’t know what is going on in the world. He has no other interests and neglects his body for his mind. He can only talk, eat, breathe, and sleep science. [...] He has no social life, no other intellectual interest, no hobbies or relaxations.”*<sup>400</sup>

As first introduced, Seth fits much of this image. He is “tall and thin” and very much “a brain” who “neglects his body for his mind.” Outside of his developing romance with Veronica, he has no interpersonal relationships of any particular worth. As he mentions while offering to let her shadow his work long-term, “I don’t have a life so there’s nothing for you to interfere with.” He only owns five identical sets of the same outfit—“learned it from Einstein”—so he never has to

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<sup>399</sup> Mead and Metraux, ““Image of the Scientist among High-School Students,” 126-127. Italics in original.

<sup>400</sup> Ibid, 127.

think about his clothes, i.e. what he puts on his body. He appears to have limited knowledge of and little interest in the outside world.

But just as quickly as the film plays into these stereotypes it begins to deconstruct them. In the car ride from the Bartok gala to Seth's laboratory, what proves to be his true driving motivation to perfect his teleportation device comes to light: he suffers from severe motion sickness on any and all forms of transport ("I hate vehicles"). André knows all the right things to say to make his motivations sound as admirable as possible—changing the world for the better, ending world hunger—but other facets of his behavior hint at the possibility that he is also driven by more selfish desires that he keeps to himself. Seth plays the role of mad scientist with his smugly delivered grandiose comments, but in his case it is these statements that are the guise, with the truth—a desire to be able to travel comfortably—that is actually far more endearing.

Seth's apartment-lab at first glance looks like a typical mad scientist's haunt—grungy, industrial, and the sliding metal door bears considerable resemblance to that of André's basement laboratory. But the inside, once again, subverts expectations. The centerpiece of the room is an upright piano; Seth immediately goes over and begins playing Beethoven, bantering with Veronica for a while before finally getting around to showing her his creation: teleporters that he calls "telepods." He demonstrates their functionality by teleporting her garter—the item she offers him when he requests something "uniquely personal" from her for his demonstration—and his pleased but stumbling response to this flirtatious gesture provides one of the many indications of his sexual inexperience present early in the film.

Amazed by the demonstration, Veronica discreetly begins to record their conversation and starts asking him more about his work, and he is more than happy to share. He specifies he does not work alone in the sense that he outsourced much of the work to various experts—

“there’s a lot of stuff in there I don’t even understand; I’m really a systems management man”—and that Bartok Industries, which funded his research, does not know about the telepods yet. As he explains, his employers let him go about his work unbothered because he is “not expensive” and “they know they’ll end up owning it all, whatever it is.” However, it is only after divulging a considerable amount of information that he realizes Veronica has been recording their conversation and gets upset. This reaction surprises her, as she had reasonably presumed that he, knowing she was a journalist, had invited her to his lab in a professional (though admittedly flirtatious) capacity. But he had “thought this was personal”—once again indicating his social naivete—and asks her to leave.

Seth seeks out Veronica the next day, wanting to explain himself and also make her an offer—exclusive rights to the telepod story *if* she agrees to refrain from publishing until he deems the device fully ready to be introduced to the world. “I’ve been working alone too long,” he says to explain why he told her so much even though he did not want his achievements to be public knowledge yet. Seeking to sweeten the deal, he offers to let her shadow him in his lab while he finishes up the telepod—she would get enough material for a big project, a book instead of just an article.

The archetypal mad scientist is not just a loner, but one who actively seeks isolation. André is of this type; he holes himself up in his lab for weeks on end, much to the chagrin of his wife, family, and colleagues. When he has science on his mind, he wants to be left to himself. Seth, on the other hand, is *lonely*—he yearns for company, for human connection. He is alone, but he does not want to be. Even when he eventually completes his transformation into a violent, crazed fly-creature, his plan is to intentionally fuse himself and Veronica together via telepod so he can become “more human than I am alone.”

From Dr. Frankenstein to André, a cornerstone of the mad scientist's narrative is the active pursuit of isolation, of being left to work unbothered. Seth presents the exact opposite trajectory: he is constantly seeking an end to his loneliness. Every major decision he makes over the course of the film is motivated by his desire for human company. He invites Veronica to his apartment because he is lonely and wants her company. He suggests she shadow his development of the telepod for the same reason. Once they begin a relationship—Veronica makes the first move, and Seth appears genuinely surprised when she confesses her attraction to him—it is his feelings of insecurity in their relationship that leads to his fateful telepod accident.

In direct conflict with the “brain” image of the scientist found in Mead's study, Seth's key breakthrough with the telepod device revolves around his discovery of “the flesh.” The film directly correlates his own personal entry into the realm of the flesh—that is, the development of a sexual relationship with Veronica—to his ability to complete the telepods, suggesting that if he had continued “neglect[ing] his body for his mind,” as the stereotypical scientist would, he would never complete the machine.

After managing a successful teleportation with a live subject (a baboon), Seth and Veronica celebrate with champagne and Seth proposes a romantic night in with Chinese food. She agrees enthusiastically before noticing a package has been delivered to the apartment—a package for her. Inside is a mock-up of the next edition of *Particle* magazine, featuring Seth's telepods as the cover story; a gesture of petty spite courtesy of her editor, Stathis, who is also her ex-boyfriend. Not wanting to upset Seth, she makes a vague excuse and rushes off to deal with the situation. Mistaking Veronica's departure for a rebuff, Seth goes on a drinking binge. With no other options for companionship but his baboon test subject, he wallows jealously in self-pity before impulsively deciding to try out the telepod for himself.

Seth's binge-drinking session merits further commentary on two accounts. The first is in the decided contrast it presents between Seth and André in terms of their attitude towards their live test subjects, and particularly their first attempts at using live test subjects, which were both catastrophic. When André comments on family cat Dandelo's desintegrator-reintegrator demise in retrospect, he comments that "it would be funny if life weren't so sacred," but the way in which he delivers the line implies that he does, in fact, see humor in the situation, he just knows he *should* not. When Seth brings up his own first ill-fated test run with a live subject, a baboon, with his second live test subject, the first baboon's luckier brother, it is to apologize to the primate for his sibling's death. André masks his bemusement at killing the family pet to save face as he is speaking to his already horrified wife; Seth expresses his remorse when there's no one around who can actually understand him—as such, it is a decidedly futile endeavor, but one undoubtedly rooted in genuine sentiment.

The second respect in which this scene warrants analysis also deals with the marked differences between Seth and André. In *The Fly* '58, science is depicted like an addictive substance and André is an addict. Equating “addictive substance” to alcohol—particularly relevant considering the first thing he requests of his wife post-accident is a bowl of “milk laced with rum”—André is a high-functioning alcoholic, generally capable of keeping his “problem” well-hidden until his fateful accident. *The Fly* '58 characterizes science like alcohol, but in *The Fly* '86, alcohol is alcohol; Seth's teleportation is an impulse decision made after downing a bottle of champagne. Unlike in the case of André and the vast majority of movie scientists who end up being destroyed by their work, there is nothing uniquely scientific about the series of events leading up to Seth's accident. Especially considering the link made between the telepods



and vehicular travel established throughout the film, his disastrous teleportation is analogous to getting in a car wreck while driving under the influence—hardly a scientist-specific problem.

Unlike André, Seth is not immediately aware of the consequences of his test run. At first, the teleportation appears to be a complete success. Seth soon realizes he has developed increased strength and acrobatic abilities. He swings from a bar in his laboratory like a gymnast. His sex drive skyrockets. Personality changes begin to manifest as well—manic speech patterns, a cappuccino more sugar than espresso. Veronica notices something is wrong, but Seth dismisses her concerns. However, unlike in the case of H el ene’s concerns (and Andr e’s corresponding dismissal of them), Veronica’s qualms do not stem from concerns over playing God or fears of scientific amorality, but knowledge of Seth. Knowing him, knowing both his body and his behavior, she quickly deciphers something is amiss, noticing first the strange hairs on his back and then the various personality changes he undergoes.

Seth tries to convince Veronica to try teleporting—again seeking companionship, he does not want to be alone in his teleportation experience—but she refuses, scared of the machine after what she has seen happen to him. They fight and end up splitting up; Seth is alone again. He realizes that Veronica was right all along as his body begins to decay, learning through the telepod’s computer log of the “Fusion of Brundle and fly at molecular-genetic level.” Seth calls Veronica to apologize. “You don’t know how right you were,” he tells her, begging her to visit—driven in this, as in all things, by loneliness, and a yearning for companionship.

Veronica finds Seth totally transformed—walking with two canes, hardly recognizable. He tells her to keep her distance, just in case he might be contagious. When she asks what happened, Seth sings a line from a child’s rhyme, “There was an Old Lady who swallowed a fly, perhaps she’ll die”—a narrative beat that like so many others in the film both alludes to the

legacy of movie mad scientists while subverting the original implications. In this case, the allusion is specific: the crazed, invisible chemist Jack Griffin terrorizing townspeople while singing “Nuts in May” in *The Invisible Man*. Both instances indicate a (relatively unusual) sense of humor in the scientist in question, but while “Nuts in May” plays entirely humorously, Seth’s singing of “There was an Old Lady who swallowed a fly,” in demonstrating his efforts to make light of his own demise, comes across as decidedly tragic.<sup>401</sup>

“My teleporter turned into a gene splicer,” Seth explains, “a very good one, and now I’m not Seth Brundle anymore.” This is perhaps the only common technophobic movie scientist stereotype that *The Fly* ’86 features without any subversion: the fatal mistake physicist Seth makes is accidentally becoming a genetic engineer, the most damning scientific trade of them all, as far as the movies are concerned. “I was an insect who dreamed he was a man and loved it,” he says, “but now the dream is over, and the insect is awake”—Seth became a genetic engineer (“a very good one”) and in doing so made himself subhuman.

With his inner insect awake, Seth—or “Brundlefly”—by this point physically unrecognizable, appears to experience a sort of Jekyll-and-Hyde-esque inner battle. He kidnaps Veronica with the intention of fusing the two of them into one person via telepods now intentionally modified for genetic engineering purposes. Stathis tries to come to her rescue but is quickly overpowered by Brundlefly; Veronica picks up the gun Stathis dropped and pleads with Seth to stop, although she finds herself unable to aim the weapon at him. Seth, overcome with some kind of change of heart, takes the muzzle of her gun in his pincers and points it towards his own head, silently asking to kill him. She refuses at first but eventually gives in.

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<sup>401</sup> Whale, “The Invisible Man.”

*The Fly* remains Cronenberg's most commercially successful film to date, and is generally regarded as the film that made Jeff Goldblum's career. As a filmmaker, Cronenberg is known for body horror, and particularly body horror linked to biomedicine and/or biotechnology, a theme which can be found throughout a number of titles in his filmography, including *Shivers* (1975), *Rabid* (1977), *The Brood* (1979), *Scanners* (1981), *Videodrome* (1983), *Dead Ringers* (1988), and *Existenz* (1999). Considering Cronenberg's personal history and interest in science, while he tackles many familiar concerns regarding the perils of scientific progress, he tends to avoid many of the most common clichés if for no other reason than his conceptions of science and scientists are not simply pulled from earlier media, but personal life experience. As David J. Skal notes, Cronenberg represents "a far more serious, and original, consideration for the shadow side of doctors, clinics, and biomedical research."<sup>402</sup>

One of the biggest ways in which Cronenberg's attitudes differ significantly from many filmmakers, and storytellers in general, tackling scientific horror is that he does not believe in the concept of "forbidden knowledge" when it comes to the secrets of life and the universe. Regarding the trajectory of André's arc in both the short story and 1958 film, Cronenberg writes that, "the idea that the scientist... must destroy what he's invented because there are things we must not know was ludicrous. Even in 1958 that theory didn't hold water but it was slightly more convincing then because of the relative naïveté of the times."<sup>403</sup> The elements of the story of *The Fly* that intrigued him and that he intended to be the focus of his version was the "much more universal" concept of aging (physical and mental decay, seen in Seth's mutant "Brundlefly")

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<sup>402</sup> Skal, *Screams of Reason: Mad Science and Modern Culture*.

<sup>403</sup> Stephanie Harrison, *Adaptations: 35 Great Stories That Have Inspired Great Films* (New York: Three Rivers Press, 2005).

form) and death, and how the story suited his personal motto that “every love story must end tragically.”<sup>404</sup>

With the story of a scientist who accidentally fuses himself with a fly, mad scientist connotations are impossible to avoid. However, a mad scientist is “a brain,” and *The Fly* ’86 is not merely “body horror,” but body tragedy—and, judging alone by how often the film’s reviews emphasize its tragic component, a very effective one.<sup>405</sup> The film is a tragedy of physical decay, and a tragedy lamenting the physical decay of a “brain” particularly detached from his own physicality would undermine its own ends. As such, the film begins with Brundle as a “brain” and shows him learning to appreciate his own physicality, his own body, to fully inhabit it and experience it, because then and only then can his decay be truly tragic. In this manner, Cronenberg’s film not only overwhelmingly subverts mad scientist tropes, but proves successful in fusing this science fiction-horror hybrid with romance and tragedy as well.

### Conclusion

Overall, these two sets of adaptation-remakes demonstrate several of the general trends in the depictions of movie scientists noted in chapter 1. Nuclear scientist Dr. Carrington demonstrates a prototypical mad 1950s movie scientist—out of touch, practically allergic to human emotion, dismissive of safety, cool and detached in contrast to the manic irrationality more common in 1930s films. As one of the more anti-scientist science fiction films of the early 1950s, *The Thing from Another World* retains a proxy to the antagonistic scientist of its source material, Dr. Blair—formerly a biologist, now a nuclear scientist to suit the concerns of 1951—but replaces the original story’s scientist-hero with Air Force Captain Patrick Hendry.

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<sup>404</sup> Ibid.

<sup>405</sup> Joe Baltake, “‘The Fly’ Rises from the Ointment,” *Philadelphia Daily News*, 15 August 1986.

The 1982 remake of the film draws more heavily from the original text than its cinematic precursor, taking advantage of developments in visual effects and animatronics to bring the shape-shifting mimic of Campbell's story to the big screen. MacReady is also restored as the hero of the story, but in spite of overwhelmingly fulfilling the same narrative role, his scientific credentials have been stripped away, reflective of the film's overall "de-scienceing" of the original narrative, a trend that would only grow in popularity in science-fiction remakes and reboots, particularly beginning in the 2000s.

Kurt Neumann's 1958 adaptation of *The Fly* is by far the most faithful adaptation of the four films analyzed in this chapter while its 1986 "remake" is the least, with David Cronenberg's *The Fly* only retaining the basic premise of a scientist accidentally combining himself with a fly while testing a prototype teleportation device. While Cronenberg's film largely subverts mad scientist stereotypes, it does feature the common technophobic/anti-science theme of (accidental) genetic engineering as a fundamentally dehumanizing endeavor.

With the exception of *The Thing* '51, all films analyzed in this chapter deal heavily with concerns regarding human artifice, and what it fundamentally means to be human. In *The Human Condition*, first published in 1958, the same year Neumann's *The Fly* was released, Hannah Arendt makes the case that human artifice "separates human existence from all mere animal environment, but life itself is outside this artificial world," but goes on to warn that, "a great many scientific endeavors have been directed towards making life also 'artificial.'"<sup>406</sup>

While concerns about what it means to be human have long been part of both horror and science fiction dating back at least to Mary Shelley's *Frankenstein*, when it comes to scientific horror it is overwhelmingly a predominant theme, and since the discovery of DNA and the

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<sup>406</sup> Hannah Arendt, *The Human Condition* (Chicago: University of Chicago Press, 1958).

development of the field of molecular genetics, this theme comes up almost inevitably whenever the subject of a film touches upon something in the realm of genetic engineering.

In *The Thing* '51, made prior to the discovery of DNA, the central scientist Dr. Carrington can merely covet the Thing's lack of humanity, dream of elucidating the secrets of what he sees as its superior vegetal nature through study. In *The Fly* '58, released not long after the discovery of DNA and one of the first, if not the first, Hollywood science-fiction film to discuss life on a molecular level, the scientist renders himself "a *thing*" in the eyes of his formerly devoted wife through an experimental mishap. Carrington wants to become a Thing; André sees that wish answered. In *The Thing* '82 science is depicted as relatively powerless one one hand, and therefore on the other, not dangerous. Still, of all the research base residents it is ultimately the Thing mimicking team biologist Dr. Blair that becomes the final monster the survivors must face. And then finally, in *The Fly* '86 Seth Brundle, who in so many other regards subverts mad scientist stereotypes, renders himself subhuman—"an insect who dreamt he was a man"—through accidentally becoming a genetic engineer. While Dr. Carrington was perhaps turned into a nuclear scientist because the threat of nuclear annihilation was conceived the worst possible threat to humanity science could create, the development of the field of molecular genetics and the concept of genetic engineering<sup>407</sup>—of changing (and where movies are concerned, inevitably destroying) the fundamental definition of being human quickly took hold in cinema as the most horrific thing science could possibly do, and from the original adaptation of *The Fly* to more recent titles like the *Resident Evil* franchise, *Splice* (2009), and *Jurassic World: Fallen Kingdom* (2018), this trend shows no signs of going anywhere any time soon.

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<sup>407</sup> As well as cloning, particularly considering that Hollywood movies do not always identify a distinction between these terms.

## CONCLUSION

The overwhelming majority of Americans do not know a PhD-level scientist personally. They have not stepped foot inside a research laboratory. As such, the average American knows of scientists and the practice of science what they encounter through the media. Considering how the presence of science and scientists in more general news sources (as opposed to specialized publications like *WIRED* or *Scientific American*) has markedly decreased since the mid-20<sup>th</sup> century, the role of popular fictional media in shaping the public image, memory, and opinion of scientists and scientific issues is worth giving serious consideration.

From the 1930s to the present, scientist characters have played central roles in some of the most successful and culturally significant films ever made, from *Frankenstein* (1931) to *Jaws* (1975) to *Jurassic Park* (1993). Real-life scientists have also played key roles in developing films that have attained equal cultural significance, from *2001: A Space Odyssey* (1968) to *The Martian* (2015), while biographical films have shaped the public memory of real-life scientists, making household names of figures like John Nash and Katherine Johnson.

In addition to shaping the public memory of the history of science and technology, popular films have shaped how audiences imagine the future, and in doing so have impacted the progression of actual scientific and technological development by introducing concepts to wide audiences and promoting theories to the public—for instance, the role of *Jurassic Park* (1993) in promoting both the field of ancient DNA studies and the birds-from-dinosaurs hypothesis or the use of *Interstellar* as a framing device to report on the imaging of the M87 black hole—and providing a key tool to help generate interest in particular technological developments and fields of study. It is furthermore worth acknowledging how different scientific fields are given very different cultural framing devices to work with. While space science has a range of highly

positive and celebratory narratives to choose from, such as *Interstellar* and *The Martian*, the predominant cultural frames used in the coverage of live sciences, and particularly things in the realm of genetic engineering and cloning, are overwhelmingly negative, from *The Boys from Brazil* (1978) to the numerous iterations of the *Frankenstein* narrative.<sup>408</sup>

The role of scientists in American cinema, both in film development and as characters on screen, has evolved over the decades, as seen in both general trends and through specific examples of adaptations and reboots such as *The Thing* (1951, 1982) and *The Fly* (1958, 1986), but no era has ever presented a monolith. Contradictory themes and trends have always existed for the scientist in Hollywood, from the contemporaneous popularity of mad scientist horror films and scientist-hero biopics in the 1930s to the 1951 debuts of those trendsetting scientist characters, Dr. Carrington and Professor Barnhardt, fundamentally akin in attitude and yet framed so differently, the former disparaged as a villain and a fool, the latter idolized as a font of wisdom.

Considerable commentary has been made in scientific publications about the portrayals of science and scientists in popular culture, with suggestions made as to how to better integrate scientists into the Hollywood pipeline. However, looking at the history of science and scientists in American film, many of these programs possess a fundamental flaw in that they set up matchmaking programs and hotlines in which scientists are available to answer Hollywood's questions. While such approaches could help avoid the needless proliferation of hugely erroneous information<sup>409</sup>, this will not result in the better narrative integration of science or an

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<sup>408</sup> Nagy et al., "The Enduring Influence of a Dangerous Narrative: How Scientists Can Mitigate the Frankenstein Myth."

<sup>409</sup> That is, technical/factual errors in the depiction of scientific practices and use of scientific terms/ concepts that simply stem from lack of understanding as opposed to narrative demands. See, for example, Wolf von Frankenstein heat-fixing a slide in *Son of Frankenstein* (1939) and then observing cells floating in liquid under the microscope.



uptick in science-based narratives, simply because the average Hollywood storyteller does not have the knowledge of science in either its current practice or its history to know the best questions to ask—in other words, to know how to find the best scientific stories that are out there. The great science-based films that have become paragons of the potential for the synthesis of both science and art and science and entertainment in the context of popular film have overwhelmingly originated from storytellers with scientific backgrounds, from the adaptations of the works of Michael Crichton (*The Andromeda Strain*, *Jurassic Park*), who graduated with a degree in biological anthropology and briefly attended medical school, to *Contact* (1997) and *Interstellar* (2014) beginning as premises conceived and drafted by physicists (Carl Sagan and Kip Thorne, respectively).<sup>410</sup> Storytellers fundamentally pull from what they know, and when individuals with scientific backgrounds have not been involved from the genesis of an idea, those ideas and the films in which they result—regardless of whatever other strengths or weaknesses these works may possess—inevitably default back to the same handful of archetypes, themes, and concepts in their handling of science and scientist characters.

While much attention has been given to how a greater popular culture presence would benefit the scientific community, little to none has been given to how this development would affect Hollywood. This represents a decided oversight, because as suggested through the listing of science-minded titles above, film history presents ample evidence to suggest that Hollywood has just as much to gain from such a partnership as the scientific community. Blockbuster films that have tapped meaningfully into scientific concepts and scientific advisors for the generation of ideas, both in terms of narrative and spectacle—the sort of visions that could inspire awe and wonder, from space stations to wormholes—have been overwhelmingly successful. Thus far,

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<sup>410</sup> Kirby, *Lab Coats in Hollywood: Science, Scientists, and Cinema*.

these mutually beneficial science-entertainment partnerships have been established in the production of individual films, but as of yet no wider framework that could encourage such ground-up collaborations has, as far as I am aware, been either established or even earnestly attempted, although the evidence does appear to suggest that such an arrangement could definitely be a symbiotic one.

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