

**THE SOCIETY OF MAD SCIENTISTS:
SCIENTISTS AND SOCIAL NETWORKING IN THE VICTORIAN
NOVEL**

by

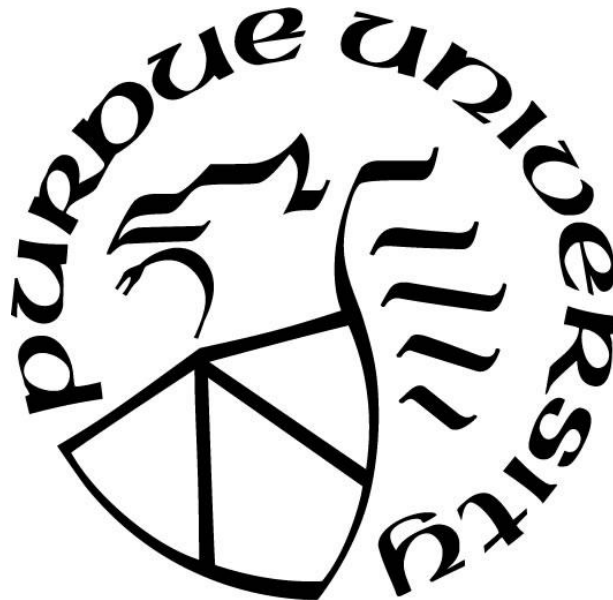
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To Jackie, my partner and traveling companion.

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INTRODUCTION—WHAT WE THINK ABOUT WHEN WE THINK ABOUT MAD SCIENTISTS



In their final year, all research science students are required to take one semester of Maniacal Laughter.

Imagine a figure in a lab coat, wide eyed and wiry haired, potentially wearing goggles, quite likely surrounded by some rather improbably complicated laboratory glassware and holding up a beaker bubbling with unknown potential. If you asked a child to draw a picture of a scientist or of a mad scientist, you will likely get very similar pictures. There seems to be a sense that interesting science has a tinge of mad science to it, a whiff of the radical and the unorthodox. And that sense does not evaporate with adolescence. The image of the scientist as a dangerous figure continues to preoccupy us as adults. We can make this observation historically as well: if the figure of the mad scientist first emerged in the nineteenth century, it continues to fascinate us, well into the twenty-first. Jekyll and Hyde still pop up in discussions of mental health, and references to other mad scientists from literature and other popular culture are common in discussions of science. GMOs are Frankenfoods. Geneticists are likened to Dr. Moreau. These references occur frequently in anti-science or anti-intellectual discourse, but they are not limited to those areas or even neutral arenas. The science positive and even scientists themselves remain enamored of the mad scientist.

The preeminent scientist Freeman Dyson was well into his eighties when he compiled *The Scientist as Rebel* (2006), a collection of essays mostly from *The New York Review of Books*. In his preface and the first essay, from which the book takes its title, Dyson holds up rebelliousness as a key characteristic of science and of scientists and considers rebelliousness in relation to society as a whole and to children in particular. Dyson defines science as “an alliance of free spirits in all cultures rebelling against the local tyranny that each culture imposes on its children” (4). Rebellion is important to Dyson, but so is creating order. He notes the beauty in reductivism but prefers “constructivist” science. Dyson holds up Benjamin Franklin as a premier example of a rebel as scientist precisely because Franklin was not interested in tearing down but in building a society and even preserving when possible (x-xii).

Dyson is aware of the related image problems even a constructivist scientist faces for their rebellious attitude. He relates seeing the play *The Physicists* by Friedrich Dürrenmatt with his fellow physicist Markus Fierz. The play features what Dyson calls “grotesque caricatures” of famous scientists like Newton and Einstein locked in an asylum. In response to his irritation, Fierz told him, “But don’t you see? The whole point of the play is to show us how we look to the rest of the human race” (15). Dyson concedes Fierz’s point and writes that it is now scientists’ duty to address this image, to show the public that “scientists are neither saints nor devils but human beings sharing the common weaknesses of our species” (15). That is an admirable goal. It is not quite mine. Rather, I am interested in the history of the grotesque caricature of the mad scientist. In the process of addressing that caricature’s history, there is interesting construction to be done and there are important things to be learned, relevant to both the Victorian period and our own.

What Can We Learn from the Mad Scientist?

This dissertation, like much of the genre of science fiction with which it is concerned, is about that caricature. It is about the apprehension, excitement, and hope we feel towards science and how we have expressed it and worked through those feelings in our art. I want to examine this apprehension specifically through the figure of the mad scientist as exemplified by some of the longest-lived texts to emerge from the formative boom in mad scientist narratives during the last decades of the Victorian era. Perhaps even more than in the nineteenth century, science and anti-science sentiment are two of the most powerful warring social forces currently at work in

the world.¹ The time seems ripe for a more direct investigation of the posterchild of their struggle and for what I hope is a fuller understanding of its use and place in literature and culture. Despite the ubiquity of the mad scientist, we still have a somewhat narrow understanding of the uses and workings of the Victorian literary portrayal of mad scientists and of scientific genius in general. The mad scientist is commonly understood as a specter of the fear of science and scientific genius—and while I believe that this is true, I also believe that it is far from the whole truth.² We cannot reduce the history of mad science to a simple anxiety response. We can and must go further in examining the uses and meanings of the mad scientist in literature, starting with the period that gave us some of the most enduring exemplars.

My dissertation will argue that some of the most popularly influential portrayals of mad scientific genius served as literary thought experiments, tests and criticisms of methods for dealing with the scientific drive for discovery and those that championed it. Far beyond a mere expression of anxiety, the subgenre of mad scientist literature was an articulation of the Victorian urge to work through this social, moral, and scientific dilemma.

In this study, I will establish two main propositions:

¹ For example, in the final days of writing and editing this dissertation, on May 29th, CNN updated an article from earlier that month on the 654 false claims by President Trump in the 98 days from January 27th, the first meeting of Trump's coronavirus task force, up to May 3rd (Dale and Subramaniam). This is one of several articles on the many false statements and generally untenable positions taken by the Trump administration during the pandemic, many of which have been specifically and deliberately in opposition to the information coming from epidemiologists and other medical professionals. This has included calling the crises itself a hoax (Milman), suggesting the virus was created in a lab (BBC), denying that anyone knew the virus would result in a pandemic (Milman), denying as late as March 27th that anyone knew what the virus was (Milman), cutting funding to the World Health Organization (Armus), and gainsaying, even burying some, CDC recommendations (Dwyer and Aubrey, Dearen and Stobbe). To lead his task force, instead of a doctor Trump chose Vice President Mike Pence, who was responsible for mishandling an HIV outbreak in Indiana, his personal biases causing him to drag his feet in following the advice of public health experts to lift the ban on non-prescription syringes (Wood). Aside from the moralizing over addiction services, the lack of care for HIV infection was quite in line with Pence's history of discrimination against the LGBTQ community that includes supporting the "reparative" therapy, long after it was understood to be abuse in mainstream psychiatry (Stack).

² Roslynn Haynes touches on this more than once in *From Faust to Strangelove* (1994), particularly noting the anxiety "arising from the mechanistic assumptions of nineteenth-century biology and psychology" (146). Anne Stiles in *Popular Fiction and Brain Science in the Late Nineteenth Century* (2011) traces several mad scientists back to specific anxieties about not only scientific debate but also impending scientific breakthroughs, such as cerebral localization, and notes that the authors themselves, such as Stoker and Stevenson, expressed such anxieties (22). This is the general understanding in the sciences as well. Joachim Schummer, a scholar of philosophy of science, takes this as writ in an article published in *Ambix* on mad scientists in nineteenth-century literature and the portrayal of chemists that links the mad scientist with the hubristic alchemist (Schummer), and anthropologist Christopher P. Tournay argues that mad scientists are critiques on science and refers to mad scientist stories as "homilies on the evil of science" (411). We see the same in discourse specifically on popular culture such as *Screams of Reason: Mad Science and Modern Culture* (1998) by David J. Skal and *Mad, Bad and Dangerous?: The Scientist and the Cinema* (2005) by Christopher Fraying. There's no denying the anxiety and fear that fuel the writing and reading of mad scientist characters.

1. Mad scientists were portrayed not as a singular personality type but as the most threatening end of a spectrum of hazardous scientific genius. These characters are linked by mad science, but they differ greatly by levels of socialization. Away from the truly mad scientists were simultaneously helpful and yet hazardous figures such as Arthur Conan Doyle's Sherlock Holmes. But even with a beneficial figure like Holmes or Bram Stoker's Abraham Van Helsing, there is a madness to their science and their pursuit of it. In terms of their science itself, all of these figures are working at least somewhat outside of what would have been normal science, beyond the ruling paradigm of their moment. In addition, they pursue their science with a sometimes unsettling zeal. The hazardous scientist possesses a fidelity to whatever truth they seek or have uncovered. That can override concern for social or moral norms. In explaining this, I will discuss Thomas Kuhn's concepts of "paradigms" and "normal science," as well as Alain Badiou's concept of truth, in the next chapter. Any scientist on this spectrum would be seen as at least potentially mentally unstable and morally questionable. They are generally brilliant, abnormal, monomaniacal, and amoral. I will explain each of these terms in more detail in Chapter One. What is important to establish is that these traits are endemic but not limited to mad scientist characters. Even the heroic scientists mentioned above shared them and thus, despite their heroism, were nevertheless portrayals of scientific genius as a troublesome thing that required special mechanisms to be made functional. Primarily, these mechanisms were relationships, which leads me to my next point.

2. Authors of these works, even those portraying clearly mad scientists, are demonstrating the difficulties and drawbacks of simple condemnation and ostracism of hazardous scientists and their work. Further, these works, even those with the most dangerous mad scientists, discourage ostracism and on the whole endorse working with hazardous scientists. The suggestion that emerges is to rein in scientific genius by tying it to a variety of social networks: political, cultural, religious, professional, and personal. This is not to say that this management of scientific genius was necessarily a "taming." In fact, to borrow Dyson's terminology, the solution is not to reduce the scientist to a lackey but to construct with the scientist a symbiotic relationship through which both can benefit. Thus, my thesis and its claims disrupt the common conception of the mad scientist as merely a figure of and for fears about science.

Mad Science: A Critical Review

Before turning in Chapter One to the scientific and historical context in which mad science novels were written, I want here to sketch out the critical context in which this dissertation has been written. Given the enduring legacy of Victorian mad science, there has been surprisingly little research on the mad scientist character itself and the rise of the most indelible examples. With the exception of Anne Stiles, few critics have focused their attention on the Victorian mad scientist, and fewer have examined dangerous scientists with the scope I wish to bring to the issue. While there have been a number of articles, book chapters, collections, and monographs by both historians and literary critics that will inform my work, a significant body of scholarship by Victorianists on the mad scientist—let alone the larger spectrum of dangerous scientists—does not yet exist.

What does exist is a rich and deep critical literature on Victorian science and scientists. Gillian Beer's work, particularly *Darwin's Plots* (1983), has been foundational in the study of the interplay between nineteenth-century understandings of science—and scientists—and nineteenth-century literature, in and out of speculative fiction.³ Beer's commentary on the difficulty of assimilating Darwin's ideas and the effects of the struggle to do so on both the literature and science of the era has a direct relationship to the work I wish to do with the dangerous scientist. Beer calls attention to the way that Darwinian evolution robbed the English of their place in the universe. The peaceful countryside was now an arena for daily, deadly struggle. Their belief in their physical beings as images of godhead was no longer safe. Even their sense of narrative and history was awash in insecurity; as Beer would remind even Freud, Darwinian theory "does *not* privilege the present" (10).

While Beer's work has been rightly influential, *Darwin's Plots* was only part of a wave of texts by Victorian literary critics and historians interested in reevaluating the interplay between science and culture in the nineteenth century. In particular, Beer's book was preceded by Roslynn Haynes' *H. G. Wells: Discoverer of the Future – The Influence of Science on His Thought* (1980) and George Levine's *Realistic Imagination: English Fiction from Frankenstein*

³ There are shades of meaning here between "speculative" and "science" fiction; speculative fiction is necessarily considering possible futures and could be considered as an adjacent to or even a subgenre of science fiction, but the terms can often be used interchangeably.

to *Lady Chatterley* (1981).⁴ Haynes and especially Levine, whose work also includes in-depth studies of Darwin and his influence, became mainstays in this area of research and historical reevaluation. These examples typified early- to mid-1980s work on science fiction and other aspects of the interplay between science and culture in Victorian scholarship in that they resisted the previous assumption that Victorian science fiction was concerned entirely with the symbolic rather than the realities of the technological.

This was an important change in the way critics considered late Victorian works. It was also an especially telling change in the common view of earlier nineteenth-century works, particularly *Frankenstein*. Science fiction critics had been claiming *Frankenstein* as the first true science fiction novel at least since the publication of Brian Aldiss' *Billion Year Spree: The True History of Science Fiction* (1973). Aldiss' book, revised in 2001 as *Trillion Year Spree*, not only claims Shelley as the mother of the genre, but also hinges on the notion that science fiction is first and foremost a genre of ideas, with its texts inextricably tied to the scientific and technological developments of their times. This view of Victorian science fiction, and of *Frankenstein* in particular, finally arrived in Victorian literary criticism in the 1980s with Samuel Vasbinder Holmes' *Scientific Attitudes in Mary Shelley's Frankenstein* (1984)—an imperfect but valuable resource and step forward in the view of that novel as science fiction that actually began as Holmes's dissertation in the late 1970s—and, of course, Anne Mellor's *Mary Shelley: Her Life, Her Fiction, Her Monsters* (1988). Mellor's book, which paints *Frankenstein* as a feminist critique of science, remains as crucial to the study of that novel as Beer's to the effects of Darwin on literature.

Mellor's work was also part of a building interest in the effects of nineteenth-century science on women and vice versa. It was preceded by Elaine Showalter's *The Female Malady: Women, Madness, and English Culture, 1830–1980* (1985) and the collection *Sex, Politics, and Science in the Nineteenth-Century Novel* (1986), edited by Ruth Yeazell, and it came out the same year as Mary Poovey's *Uneven Developments: The Ideological Work of Gender in Mid-Victorian England* (1988). More recent work continuing Yeazell and Poovey's analysis of the effects of science on gender includes Patricia Murphy's *In Science's Shadow: Literary*

⁴ Haynes's book is only one of the books on Wells's science fiction from the early 1980s. There is also *The Science Fiction of H. G. Wells* (1981) by Frank McConnell and *The Logic of Fantasy: H. G. Wells and Science Fiction* (1982) by John Huntington.

Constructions of Late Victorian Women (2006) and Fred Botting's *Gothic Romanced: Consumption, Gender and Technology in Contemporary Fictions* (2008), as well as Amy King's *Bloom: The Botanical Vernacular in the English Novel* (2007), which, in a more specific follow-up to Londa Schiebinger's *Nature's Body: Gender in the Making of Modern Science* (2004), focuses on the relationship between nineteenth-century botany and nineteenth-century sexuality, specifically the figure of the "blooming girl." Some critics, like Levine, saw the moral and aesthetic purpose of Victorian realism as a valiant, if not always successful, attempt to break from convention and capture reality. At the same time, scientists and historians of science like George Drinka, author of *The Birth of Neurosis* (1984), were producing history and criticism focused first on archival research from the viewpoint of scientists and subjects, rather than deconstructions of larger trends and institutions.

With Beer having firmly established the effect of scientific writing on literature, the next decade in criticism on the topic was largely preoccupied with the question of exactly how to interpret the representation of science and scientists in fiction. Lawrence Rothfield's *Vital Signs: Medical Realism in Nineteenth-Century Fiction* (1992) takes the position that the scientist rather than the science was the point—that mid-nineteenth-century realism was less about representing reality in gritty detail than demonstrating the changing nature of narrative, authority, and professionalism at a time when medical discourse was gaining influence. Also interested in representations of doctors was Roslynn Haynes, whose *From Faust to Strangelove: Representations of the Scientist in Western Literature* (1994) remains the only published comprehensive study of the image of the scientist in Western narrative, tracing the development of the figure from the alchemists of Early Modern drama and all the way up to twentieth-century film. Stephen Arata's *Fictions of Loss in the Victorian Fin de Siècle* (1996), while not primarily concerned with science, nevertheless analyzes several texts concerned with science, linking the rise in scientific discourse overall with the sense of loss he argues characterizes late Victorian literature. A similar argument can be seen later in Kelly Hurley's *The Gothic Body: Sexuality, Materialism, and Degeneration at the Fin de Siècle* (2004).

The late 1990s and early 2000s also saw critics invest their work in the meaning behind the specifics of representation. A significant amount of this focused on Victorian detective fiction, e.g., Ronald Thomas' *Detective Fiction and the Rise of Forensic Science* (1999), with a mini-boom in this category of criticism in the early 2000s: Lawrence Frank's *Victorian Detective*

Fiction and the Nature of Evidence (2003), Joseph Kestner's *Sherlock's Sisters: The British Female Detective, 1864–1913* (2003), and criminologist Colin Wilson's *Written in Blood: A History of Forensic Detection* (2003), all published in the same year. Stoker's work, particularly as it related to social sciences, also received attention. William Hughes and Andrew Smith's edited collection, *Bram Stoker: History, Psychoanalysis and the Gothic* (1998), and Carol Senf's *Science and Social Science in Bram Stoker's Fiction* (2002) were both influential in directing critical attention to the scientific literacy and commentary on science in Stoker, particularly in *Dracula*. George Levine published another major contribution, *Dying to Know: Scientific Epistemology and Narrative in Victorian England* (2003), in which he examined the ways in which nineteenth-century science increasingly valued and struggled to embody objectivity and the effects this had on narrative. His later *Realism, Ethics and Secularism: Essays on Victorian Literature and Science* (2008) continues this reflection on the production and location of truth in an increasingly scientific and secular Victorian Britain.

The early 2000s also saw a renewed interest in the link between madness and genius, the history of which had previously been explored somewhat by Roy Porter and Joel Peter Eigen's work on the history of psychiatry and psychology and more specifically by George Becker in his still influential *The Mad Genius Controversy* (1978). Recent work in this area, with the exception (to some extent) of clinical psychiatrist Albert Rothenberg's *Creativity and Madness: New Findings and Old Stereotypes* (1990), had a contemporary bent. However, the 2000s saw more works, in and outside of literary criticism, that looked to the past, sometimes specifically to the nineteenth century, in their analyses—books like anthropologist Daniel Nettle's *Strong Imagination: Madness, Creativity and Human Nature* (2001), Alan Richardson's *British Romanticism and the Science of the Mind* (2001) and *The Neural Sublime: Cognitive Theories and Romantic Texts* (2010), Corinne Saunders and Jane Macnaughton's collection *Madness and Creativity in Literature and Culture* (2005), and neuroscientist and neuropsychiatrist Nancy Andreasen's *The Creative Brain* (2006).

Despite this interest by some in the nature of genius, the mad scientist has received little attention as a special figure in literature. Most criticism on representations of science and scientists in literature has followed Beer's cue and looked at such figures as expressions of Victorian anxiety over scientific advancement and social change. With the exception of Roslynn

Haynes's book,⁵ most of the criticism on characters who could be categorized as mad scientists or dangerous scientists focuses specifically on a single character, text, or author. As well as Shelley and Stoker, a substantial amount of work has been devoted to Stevenson—from William Veeder and Gordon Hirsch's edited collection *Dr. Jekyll and Mr. Hyde after One Hundred Years* (1988), to Showalter's chapter "Jekyll's Closet" in her *Sexual Anarchy* (1990), to Julia Reid's *Robert Louis Stevenson, Science, and the Fin de Siècle* (2006). Wells's science fiction has continued to receive attention, although, with the exception of Steven McLean's *The Early Fiction of H. G. Wells: Fantasies of Science* (2009), a considerable portion of the recent work devoted specifically to his science fiction was published in the early 1980s.

Other examinations of representations of scientists in literature, whether by critics, historians of scientists, or scientists themselves, have tended to group all representations together rather than single out the mad or dangerous scientists for special attention. Such is the case with the two primary texts on science and scientists in periodicals, *Science Serialized: Representations of the Sciences in Nineteenth-Century Periodicals* (2004), edited by Geoffrey Cantor and Sally Shuttleworth, and *Culture and Science in the Nineteenth-Century Media* (2004), edited by Louise Henson, Gowan Dawson, Richard Noakes, and, again, Geoffrey Cantor and Sally Shuttleworth. This generalism is also evident even in the work that continues Rothfield's interest in the effect of scientific authority, such as Tabitha Sparks's *The Doctor in the Victorian Novel* (2009), which includes discussions of mad scientists like Wilkie Collins's Dr. Benjulia, and Anne DeWitt's *Moral Authority, Men of Science, and the Victorian Novel* (2013), which examines, among others, H. G. Wells.

Much of the analysis, particularly that done by historians and scientists, has been much broader than the nineteenth century, and some has tended to focus more on the twentieth. Examples include Chris Toumey's *Conjuring Science: Scientific Symbols and Cultural Meanings in American Life* (1996) and the collections *Chemistry and Science Fiction* (1998), edited by chemist Jack Stocker, and *The Public Image of Chemistry* (2007), edited by chemists Joachim Schummer and Brigitte van Tiggelen and historian Bernadette Bensaude-Vincent. There has been some Victorian-specific work, notably the collection *Repositioning Victorian Sciences: Shifting Centres in Nineteenth-Century Thinking* (2006), edited by David Clifford, Elisabeth

⁵ Sadly, for my own purposes, Haynes has since focused much of her work on Australasian cultures.

Wadge, Alex Warwick, and Martin Willis, all of whom have backgrounds in literature with interests in the history of science.

Darwin, central to this branch of criticism from the start, has endured as a mainstay, an acknowledged force of science and culture in the nineteenth century. The last decade has seen several books on Darwin's cultural impact, including Levine's *Darwin Loves You: Natural Selection and the Re-Enchantment of the World* (2006). Two books have been published on Darwin's effect on visual culture: Jonathan Smith's *Charles Darwin and Victorian Visual Culture* (2006) and Barbara Larson and Fae Brauer's collection *The Art of Evolution: Darwin, Darwinisms, and Visual Culture* (2009). There has also been the foreseeable, and necessary, response to this focus from works like *(Re)Creating Science in Nineteenth-Century Britain* (2007), edited by Amanda Mordavsky Caleb, a collection which explores a myriad of intersections between culture and science, partly in an effort to expand the critical gaze further beyond Darwin.

Aside from Haynes, perhaps the only critic to focus on mad scientists as a group has been Anne Stiles, editor of the collection *Neurology and Literature, 1860–1920* (2007) and author of *Popular Fiction and Brain Science in the Late Nineteenth Century* (2012). More than most critics on the subject, Stiles connects the Victorian representations of scientists and scientific genius with specific concerns over scientific advancement, tying together Victorian scholarship as well as modern criticism on both topics, though she is not as interested in the social relationships in the texts as some other critics have been.

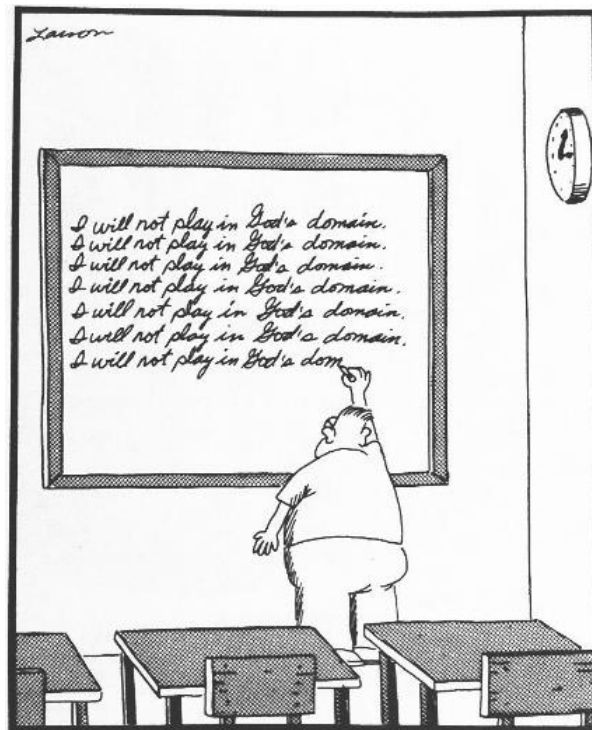
While all of the work and critics above have provided illumination on the Victorian portrayal of the hazardous scientist, our understanding of the figure and its use remains insufficient. Again, I intend to use the previous work to expand this understanding by reading the representations of dangerous scientists not merely as expressions of anxiety, but as literary experiments in the forming of productive and even mutually beneficial relationships between society at large and the scientific genius.

Chapter Outline

The chapters that follow treat the most enduringly popular late-Victorian works featuring mad scientists. Chapter One both provides the historical and scientific background that made the late-Victorian period a particular flash point for mad science and novels about it and lays out the

schema that I use in the remaining four chapters to assess the figure of the mad scientist as he appears in novels and stories by Robert Louis Stevenson, H. G. Wells, Bram Stoker, and Arthur Conan Doyle. In Chapter Two I will consider the dysfunctional but still crucially present social networks in *Jekyll & Hyde*. In Chapter Three I will further explore the rejection of social networking in *The Island of Doctor Moreau* and the ultimate consequences of this refusal from both sides, including the role into which the audience is called by this refusal. In Chapter Four I will look at a more functional mad scientist, Bram Stoker's Abraham Van Helsing, examining how he fits the mad scientist trope and yet holds a position of esteem on an international level. In Chapter Five I will look at Sherlock Holmes, the preeminent hazardous scientist of late Victorian literature, and the relationships that make his success as a consulting detective. Finally, in the Coda, I will review some twentieth-century and contemporary pop culture as well as current events and consider the future of this trope and its potential effects on popular discourse around science.

CHAPTER ONE—THE GOLDEN AGE OF MAD SCIENCE NOVELS



Young Victor Frankenstein stays after school.

The first occurrence of the term of “mad scientist” listed in the OED is from a single brief use in “The Finger of Fire,” a short story by G.W.B. published in 1883 in Ohio’s *Newark Daily Advocate*, a story that was in fact first published two years earlier in *Romance, Being the Tales of the New York Story Club*. However, the concept of mad genius goes back much further. Of course, there was a history of mythological wizards and legendary alchemists to draw on, but the seed of the mad scientist was in the classical conception of the melancholic genius, embraced by the Romantics as an ideal of the artist and later a less idealized concept important to Victorian psychiatry and psychology, a development George Becker relates in his *The Mad Genius Controversy*. The commonly accepted view of mental function at the time was as a circle, with normality and stability at the top and genius and madness side-by-side at the bottom.

If the mad scientist tree was fertilized by philosophy, psychology, and cultural history, it was watered by nineteenth-century scientific development and controversy. It would be madness itself to deny that there are examples of mad scientist narratives before the *fin de siècle*. Mary Shelley’s *Frankenstein* (1918) is the ur-text for the mad scientist and arguably the beginning of

science fiction as a genre. However, the next several decades provided a great deal of interest, concern, and incredibly fruitful debate for writers to work with. The scientist as a figure ascended along with science. Beatrice Webb, one of the founders of the London School of Economics and of the Fabian Society wrote that:

For who will deny that the men of science were the leading British intellectuals of that period; that it was they who were the self-confident militants of the period; that it was they who were routing the theologians, confounding the mystics, imposing their theories on philosophers, their inventions on capitalists, and their discoveries on medical men; whilst they were at the same time snubbing the artists, ignoring the poets, and even casting doubt on the capacity of the politicians? (Heyck 81)

While Webb might be exaggerating, the exactness of the statement is not as important as is the way it clearly embodies views that were prevalent enough for a leading British intellectual to feel and express.⁶

The *fin de siècle* was harvest time for mad scientist novels, a crop that had been in preparation for over a century. At the close of the eighteenth century, science was in the process of an ideological and practical shift from an experimental yet spiritually motivated search for knowledge through the reading of God's "book of nature" to a more extreme empiricism, a materialistic as well as positivistic endeavor. This continued through the nineteenth century. For example, one of the naturalism textbooks at Cambridge during Charles Darwin's time at Christ's College in the 1820's and 1830's was William Paley's *Natural Theology, or Evidences of the Existence and Attributes of the Deity Collected from the Appearances of Nature*.⁷ By the end of the nineteenth century, students at Cambridge were learning their lessons out of Darwin.

What I hope to do in this chapter is to outline those forces that produced not only this remarkable scientific shift but also the efflorescence of science fiction novels at the end of the century. I will discuss some of the changes in science through the nineteenth century and the interplay between science and nineteenth-century British culture, first in regard to these in

⁶ In *The X Club: Power and Authority in Victorian Science* (2018) Ruth Barton argues that Webb exaggerated, and that modern scholarship has not shown such a clear preeminence of scientists in Victorian society (Barton 363). However, it is perception rather than accuracy that is important here.

⁷ Aileen Fyfe disputes that this was a generally assigned text at Christ's College at the time. Still, Fyfe quotes a passage in Darwin's autobiography in which he extols the importance of Paley, including *Natural Theology*, to his undergraduate education. Interestingly, Fyfe makes a convincing case that *Natural Theology*, despite the religious bona fides of its author, might well have been seen as too suggestive of deism for the increasingly evangelical atmosphere of Cambridge at the time, suggesting that it may not have been religious enough to cut it as an assigned text in many colleges (Fyfe 321).

general and then through the lens of some major public scientific debates of the day: the activities of resurrection men, evolution, vivisection, and cerebral localization. This context will help to inform a discussion of the persona of the mad scientist. Finally, I will apply this work to a pilot study of Wilkie Collins' Dr. Benjulia.

The Rise of Materialism and Professionalism: Science as a Power

The nineteenth century was the century in which science grew as a power block. As science became more materialistic and empirical, it became more philosophically and motivationally separate from other concerns. It also became one of, if not the, dominant means for understanding the natural world. At the start of the nineteenth century, science, even as a collective enterprise, was still largely seen as a pastime rather than a profession, a state mourned as late as 1851 by Charles Babbage, who observed that there was then not even a word in English with which to express the occupation of science (Babbage, 189).⁸ Of course, it was well before 1850 that certain areas of science and the application of scientific knowledge were becoming professionalized. Medicine, the field of many literary mad scientists, was already beginning processes of scientification, an increasing materialism and empiricism, and professionalization, which itself led to increased specialization.⁹ This rise of materialism and empiricism and also simultaneous shift to professionalism were happening in a great many scientific fields. At the same time, science was becoming a pastime beyond the upper classes. This multiplying of hobby scientists among the working classes served to further spread scientific literacy.¹⁰ Thus, at the same time science was becoming at least more independently

⁸ The word "scientist" was in fact coined by at least 1834, according to the Oxford English Dictionary, but clearly not in such widespread use that its dominance as a term was taken for granted even by scientists of the time ("Scientist").

⁹ I will go into this more a little further in the chapter, but some of the relatively recent works discussing this include *The Making of Modern Science: Science, Technology, Medicine and Modernity: 1789–1914* (2009) by David Knight, *A Famous and Flourishing Society: The History of the Royal College of Surgeons of Edinburgh, 1505–2005* (2005) by Helen Dingwall, and, also approaching from the past, *Medicine before Science: The Business of Medicine from the Middle Ages to the Enlightenment* (2003) by Roger French. I also found illuminating German philosopher Wolfgang Iser's chapter "The Concept of the Art of Medicine" in *Science, Technology, and the Art of Medicine: European-American Dialogues* (1993), which discusses the progress of the scientification of medicine in relation to (and sometimes in tension with) the development of the art of medicine, particularly as it is practiced.

¹⁰ Again, I will go into this further—Olson has some particularly good things to say here, as does Berman—but some other works to consider are William H. Brock's *Science for All: Studies in the History of Victorian Science and Education* (1996), *Science Serialized: Representation of the Sciences in Nineteenth-Century Periodicals* (2004) edited by Geoffrey Cantor and Sally Shuttleworth, *Victorian Popularizers of Science: Designing Nature for New Audiences* (2010) by Bernard Lightman (which I will also mention again), and, though his focus is a little earlier,

motivated, scientists were becoming more powerful, and scientific interest and literacy were becoming more diffuse.

This shift from an aristocratic to an industrial direction for science, and the subsequent discomfort of many scientists with fitting research to industrial, commercial goals, can be observed in the history of two of the most influential scientific societies of the era, the Royal Society and the Royal Institution. Morris Berman in *Social Change and Scientific Organization: The Royal Institution, 1799–1844* (1978) distinguishes the RI from the RS in great part over their practical and economic interests: The RI had them. At a time when the RS was much less interested in applied science, the RI “was one of the major forces for the transition of British science from a murkily constructed pastime ... into a more definite as well as socially relevant collection of specific disciplines” (Berman xx-xxi). Berman traces the development of the RI from a body begun primarily by improving landlords to one that by the 1830s was governed primarily by professionals, mostly lawyers, with heavy involvement by industrialists and merchants.

While industrialists were at first wary of spilling trade secrets, the merchant class—the colonially inclined among the professionals—latched onto the opportunities of the new scientific community. As well as the benefits of hobnobbing with social and political elites, the middle class partook in an entrepreneurial scientific ideology that flowed in part from their colonial experience, as many of them were East India Company folk (Berman 77). Berman quotes James M. Holzman’s description of science in *The Nabobs in England* (1926) as “an integral part of British hegemony in Asia” (80). The EIC’s history as a driver of science has been well noted in texts such as John Gascoigne’s *Science in the Service of Empire* (1998), David Arnold’s *Science, Technology and Medicine in Colonial India* (2000), and the recent collection *The East India Company and the Natural World*, edited by Vinita Damodaran, Anna Winterbottom, and Alan Lester. From the EIC’s point of view, botany, veterinary science, agriculture, and medicine were tools of empire, and their application and professionalization were matters of great economic and political importance.

Of course, scientists themselves were interested in relationships with the gentry, industrialists, and merchants, but they were also interested in reaching out to the general public

Larry Stewart’s *The Rise of Public Science: Rhetoric, Technology, and Natural Philosophy in Newtonian Britain, 1660–1750* (1992).

as part of a desire to spread and venerate science itself, a desire key to the development of nineteenth-century science. Jostling priorities among these relationships could be a source of disharmony; Berman tells the story of Thomas Webster's battle with EIC influences over the purpose of the RI's school: the spread of scientific literacy versus the education of future nabobs (99). Webster got his way, for the most part. That he tried, and that students wanted to come, is the important thing. And attendees were interested in all sorts of new and unconventional ideas. It is worth noting that this evolution of the scientific community was contemporaneous with the loosening of religious restrictions for Protestant Dissenters and Catholics at the close of the 1820s and with the Reform Act of 1832.

Richard Olson¹¹ notes how groups like the Society of the Diffusion of Useful Knowledge and the various mechanics' institutes, many of which were run or influenced by free thinkers, promoted the cheap literature movement to "bring scientific knowledge and education to members of the working classes" (Olson 168). Such organizations and movements within the scientific community were part of a dissemination of scientific interest and literacy that facilitated a growing class of scientific literates and science practitioners among the lower middle and working classes. Cahan's review of criticism on the mechanics' institutes shows a critical split as to the social function of such organizations: some arguing that the focus on practice over theory was a subtle attempt to enforce social control on working-class students of science, using science to maintain social order; and others focusing on the potential for social power granted by greater scientific literacy (316-17).

Around the same time, throughout the 1830s, the Bridgewater Treatises were published. In *Victorian Popularizers of Science* (2007), Lightman notes the religious aims behind the Bridgewater Treatises, the collective successors to Paley's *Natural Theology*, which, being more conceptual than technical, helped lay the foundation for what was becoming popular science writing (23). The treatises were influential in the public understanding, and even perhaps in the university organization, of specific fields of science. An example of both religious bent and increasing specialization, William Whewell's *Astronomy and General Physics* (1836), rejected

¹¹ In *From Natural Philosophy to the Sciences* (2003), Cahan laments the dearth of solid historical criticism on the proliferation of scientific societies. The more than ten years since Cahan's work has seen only a few works focusing on this area. Richard Olson's *Science and Scientism in Nineteenth Century Europe* (2007) includes some valuable perspective on not only Britain's scientific development relative to the continent but also the part played by a variety of scientific societies in shaping the philosophy and practice of science in the nineteenth century.

the deductive approach he saw as leading to reductive and materialistic science and even included a section on “Religious Views, as Joan L. Richards notes” (55). In response, Charles Babbage, a religious man himself but also an exacting rationalist who believed in the power of math and science to reveal divinity, wrote, uncommissioned, *The Ninth Bridgewater Treatise* in defense of deductive science (57-59). Even as scientists reached out to the public, lines were being drawn both within and around the scientific community. The materialistic/positivistic model was becoming the scientific model, and, as T. W. Heyck puts it in *The Transformation of Intellectual Life in Victorian England* (1982), by 1840 the “propagandizing of the scientific model of intellectual activity” was inextricably tied to not only the “institutionalization of science” but also a “break from theology” (82).

That break from theological authority was synchronous and simpatico with the break from social authority and old philosophies of science at the heart of the new scientific outreach to the public. Regardless of the intention of schools like the mechanics’ institutes, such organizations, as Olson says, were part of a change in the relationship between the natural philosopher and the artisan. Olson quotes an 1850 edition of *The Working Man’s Friend and Family Instructor*:

The experimentalist has to put up forges, or furnish laboratories, at a great trouble and expense; but the smelter, the blacksmith, the founder, the glass blower, and a hundred other mechanics and operatives, have all this apparatus daily before them, and therefore without any trouble, might sound the depths and scan the heights of knowledge. Nothing would be required but a little observation. (Qtd in Olson, 176)

Previously, science had been conceived as very much a top-down affair. The elites discovered knowledge that the artisans put into use; mechanics refined methods. This notion was not exactly overturned, but it was questioned in early Victorian Britain.

Again, this questioning was directly related to the new emphasis on experimentation and materialism, an emphasis that not only implied social mobility but also promised intellectual availability. In fact, in the text from *The Working Man’s Friend* (a publication of social reformer John Cassell), an article titled “The Importance of Having a Scientific Knowledge of his Trade or Occupation,” goes on in the next paragraph to assert that “we have made these remarks to show that philosophy is within the reach of every working man and working woman” (“The Importance of Having” 35). Previously, deep study and thought were the purview of the philosopher, but the development of a scientifically literate populace challenged that order. So,

too, did the development of a large scientific community, one bound by shared intellectual and professional interests as opposed to merely by class. As the socioeconomic power of science and technology became more apparent in the everyday lives of the British at the start of the Victorian era, interest in science was spreading to all social strata, and several noted scientists of the first half of the nineteenth century—William Smith, John Dalton, Humphrey Russell Wallace, and Michael Faraday (who is perhaps the best known popularizer of science)—came from working-class backgrounds and lacked university educations.

Under construction was not merely a new way of doing science but a new conception of science as dispassionate and independent. As Martin Fichman says, citing Frank Turner as he does so, “from the 1840s onward, the Victorian scientific world was essentially transformed into a modern professional community” (Fichman 101). As Fichman goes on to note—along with every historian of science who addresses the issue—scientific societies, schools, and related journals played an important role in bringing about that demonstration. In this way, materialism was enshrined as a scientific principle both for scientists and in the minds of the public—perhaps best encapsulated in the philosophy of Utilitarians, which Berman and Lightman note included the lion’s share of the RI leadership by the Victorian era. The Utilitarians, as Berman says, reframed “social problems” as “technical difficulties” (Berman 108; Lightman, “Refashioning” 30-31). Yet, as Turner notes in “Victorian Scientific Naturalism and Thomas Carlyle,” the belief of the scientific naturalists who became “one of the most vocal and visible groups on the Victorian intellectual landscape” did not quite endear them even to those who functionally agreed with them in many respects (325-31). The new scientific community of materialistic professionals directing the institutionalization and spread of science was crucial to the establishment of a scientific viewpoint that could and would stand apart from and survive clashes with religion, industry, politics, and even the public interest, at least as the public saw it. In fact, well before mid-century, one such clash was already taking place between the public and the recently professionalized and increasingly scientific medical community.

The Scientification of Medicine

We have already touched on the rise of material science and the switch from religious natural philosophy to experiment-driven scientific study, but more can be said to explain how that development concerned Victorians and also paved the way for the rise of the literary mad

scientist. I will start by going back to the scientification of medicine and afterwards discuss some of the specific scientific controversies that fueled the literature.

The scientification of medicine had begun to pick up steam toward the end of the eighteenth century. In this process, medicine created a model for scientific progress through experimentation as well as for scientific professionalism. It also helped to create a sense of unease between the public and the scientific community. Medical science in particular and biology in general was the source of the greatest and most troubling public controversy over science in the Victorian era. Before 1800, medicine was hardly a profession. Physicians, as separate from surgeons, served only a few wealthy patients and were principally gentlemen rather than paid professionals, as they were not allowed to charge for advice but rather were more obliquely compensated for their attentions (Berman 102). Knowledge of the classics played at least as large a role as science in their education, particularly for graduates of Oxford or Cambridge (Bonner 40). By the end of the eighteenth century, there was already a contrasting model in Britain emerging at Edinburgh, though it was not always taken seriously. In *Becoming a Physician: Medical Education in Great Britain, France, Germany, and the United States, 1750–1945* (1995), Thomas Neville Bonner relates a story of a student ridiculing his professor's and classmates' ignorance of Latin (33-34).

However, as doctors began to charge fees and acquire professional status, Oxford and Cambridge lost much of their hold on the British medical establishment, and Edinburgh stood out as one of the premier schools for young men in search of a medical education (Pickstone 125). The University of Edinburgh's Medical School had been pouring out a river of top physicians and naturalists since the 1720s, particularly Dissenters, who were not allowed at Oxford or Cambridge at the time (Hamilton 118-19). It had also become the model for medical schools abroad, especially in America (Roser, *Thistle on the Delaware*; Bonner 43, 98). Most English physicians as well as surgeons were trained via apprenticeship in the eighteenth century, and membership in the elite Royal College of Physicians usually required an Oxford or Cambridge degree even into the 1830s (Olson 178). However, the scientific edge of the Scottish medical education which had so embraced the Enlightenment soon made Edinburgh the place to be. Between 1700 and 1750, 406 students graduated in Scotland with medical degrees; the next 50 years saw 2,500 graduates (Geyer-Kordesch 103). What ambitious young Britons found upon their arrival at Edinburgh was professional medicine, facilitated by advancements in surgery,

germ theory, anesthetics, blood transfusions, vaccines, the invention of the stethoscope, and more—a world apart from Oxford and Cambridge.

Education at Edinburgh was both far more scientific and far less religious than at Oxford and Cambridge in the early nineteenth century. Oxbridge professors did little lecturing and even less teaching. Instead, the bulk of the education was conducted by tutors, fellows who had taken orders and were thus all Anglican clergy, usually chosen for moral uprightness and breadth of knowledge rather than competence in a particular field (Olson 178). Tutors were usually schooled in Greek and Latin, literature, moral philosophy, some mathematics, and very little natural science. Future leaders who gestated at Oxbridge had little understanding of science and the scientific method, and they “often retained an antipathy to science and scientists throughout their careers” (179). In contrast, Edinburgh (the city and the university) was the home of the Scottish Enlightenment. Science education at Edinburgh was not only done by professors but also rooted in materialistic science and based on empiricism and practical experience in the lab and the hospital (Bonner 41; Rosner, *Medical Education* 62-85). Undergraduate education at the school was based on Scottish Common Sense Realism or Common Sense Philosophy, which placed this empirical spirit side by side with an ambition to demonstrate the compatibility between science and Christianity (Hamilton 111). Despite this remaining religious concern, however, almost none of the professors were clergy, and a few, like John Leslie, were openly irreligious (Olson 180).

The historians who write on Edinburgh education often mention a sense of connectivity and compatibility of knowledge that carried through to other disciplines. Along with empiricism, this connectivity was part of the Edinburgh model, which related medicine to other scientific disciplines. By the turn of the nineteenth century, Edinburgh had established itself as home to a scientific approach to surgery, an approach that was gaining ground throughout Europe and America. Throughout the late eighteenth century and through the Victorian era (and, indeed, still today), the university graduated and employed a horde of eminent western physicians and medical scientists, including Benjamin Bell, author of *A System of Surgery*; Philip Syng Physick, “the father of American surgery”; John Collins Warren, a founder of the *New England Journal of Medicine* and the first dean of Harvard Medical School; and James Blundell, who performed the first successful human blood transfusion—and those are just a few Edinburgh men from the first few decades of the century, a fraction of the host of medical scientists and researchers

responsible not just for isolating diseases but also for launching whole branches of medical research.

By the beginning of the Victorian era, the same time the RI was becoming an organization run by professionals, the scientification of medicine had transformed the physician and healer into an active part of the scientific community, a community undergoing a shift toward a more materialistic and empirical ideology, and many of whose members sneered at the vestiges of theologically driven naturalism. Noted Edinburgh graduate and anatomist Dr. Robert Knox, for instance, referred to the Bridgewater Treatises as the “Bilgewater Treatises” (Richards 404). Furthermore, while the EIC wanted doctors, many men of medical science were less interested in simple practice than research and even governance over scientific bodies. Berman refers to RI head A. B. Granville’s 1830 attack on the RS, *Science Without a Head*, in which Granville notes the interest of London doctors in managing scientific academies and other public institutions along with directing hospitals (104). The early-nineteenth-century Edinburgh graduates above were part of an important change not only in medicine, but also in science, as their efforts helped establish medicine itself as a cutting-edge scientific endeavor (Geyer-Kordesch 110). Such a transformation fueled British anxiety over scientific advancement. Of course, human physiology had long been a scientific interest, and anatomical theatres had been used across Europe since the sixteenth century. However, those medical students, when finished with their training, had not been nearly so accessible to the public as the university-trained medical practitioners were becoming in the early nineteenth century. The blurring of the line between scientist and doctor brought any British citizen who could afford a doctor into the laboratory of the scientist and so effectively put the British body under a scientist’s microscope.

Scientific Controversies of the Nineteenth Century

The nineteenth century saw a number of major and sometimes very public debates over scientific advancement which questioned the validity and appropriate boundaries of scientific study—too many to discuss here. What follows is some pertinent background on four of the most important of those controversies, all of which played a part in forming the public image of the scientist and especially the mad scientist.

1. The Resurrection Men

Luigi Galvani used frogs' legs in his most famous experiments on electrical stimulation of lifeless muscle, but his nephew Giovanni Aldini presented a much more sensational performance for Londoners in 1803 with the corpse of the recently executed convict George Forster (Rauch 238-45; Morus 809). Nothing in the first half of the century so well displayed the public's unease with its position as object of study quite like the growing fear of resurrection men, who stole fresh corpses from cemeteries and sold them for research and education to medical professionals impatient with the poor and unreliable stream of bodies for study flowing from the prison system. The Murder Act of 1752 had granted the bodies of convicted killers to medical study; the growing field meant that, as Elizabeth Hurren recently put it in the *Lancet*, "anatomical demand exceeded homicide rates" (Hurren 302).

Fear of the resurrection men reached a fever pitch with the famous Burke and Hare case in 1828. Expediting the normal resurrection-men procedure, Burke and Hare simply murdered people for their corpses, selling them to the respected Dr. Robert Knox of Edinburgh, the very same Knox who derided the "Bilgewater Treatises." The case cast a pall over Knox and the public image of all physiologists and physicians, whose innocence in the trade was questioned by the public and who were already suspect merely for the act of dissection, even of known murderers (Richardson 52-54, 138; Marshall 20). An editorial in the *Lancet* pointed to Burke and Hare as the "real authors" of the subsequent legislation which would become the Anatomy Act of 1832 ("Mr. Warburton's Bill" 818). Historians and literary critics, particularly Tim Marshall in his *Murdering to Dissect: Grave-robbing, Frankenstein and the Anatomy Literature* (1996), have also made the case for Shelley's role in the Act, noting the parallel fervors over Frankenstein and Knox.¹²

The legislation, while praised by the *Lancet*, further damaged public perception of science and medicine. The Murder Act had given over criminals' bodies to medicine, but the Anatomy Act of 1832 did the same to any who died insolvent. While the act may have been useful in crippling the market for the resurrection men, dissection as the fate of the most odious villains created unsavory enough association (Richardson 270-71). Medical objectification as a

¹² Incidentally, both have been played by Peter Cushing, who, after having already established himself as Hammer Horror's Dr. Frankenstein in 1957, played a rather similarly amoral and obsessive Dr. Knox. He went on to play Frankenstein another half-dozen or so times.

punishment for dying poor added a new shade of fear to the image of the physiologist and further painted science as a cruel means of oppression. The scientist himself seemed an aloof and inhuman figure, pitiless and concerned only with his own work, a developing image captured perfectly by fig. 1, an illustration of Knox circa 1830, featured in Adrian Desmond's *The Politics of Evolution* (1989).



Fig. 1

2. Evolution

The public concerns over science's growing objectivity, professional detachment, and materialism were exacerbated by the debates over evolution intensified after Darwin's *On the Origin of Species* in 1859. Many Victorians understandably (and not exactly incorrectly) saw Darwin as reductive of nature in general and humanity in particular, much as they did the



Fig. 2

dissecting anatomists. Darwin himself strengthened parallels between his own work and that of the anatomists when he used images from Duchenne de Boulogne's electro-physiological experiments in his 1872 work, which already had the potentially troubling title *The Expression of the Emotions in Man and Animals*. With evocative captions like "Terror," the photographs—revolutionary in the recording of medical experimentation—and specifically the rictus of de Boulogne's subject, an example of which can be seen in fig. 2, could hardly but recall the work of men like Aldini (Sobieszek 36-39).

George Levine isolates what is most troubling about the Darwinian view in *Darwin Loves You* (2006) when he discusses the transformation of "mysteries" into "problems," what Levine notes Max Weber poignantly called "disenchantment" (Levine xiii, 45). Obviously, the characterization of humanity as rising with the rest of the animal kingdom as opposed to descending to rule it was (and is) troubling to many. However, in considering the religious implications of Darwinian evolution, it is worth noting that, as Frank Turner writes, natural selection was only the "final element of the broader naturalistic synthesis of man and nature" which had been taking shape in the sciences over the course of several decades (Turner 29). Still, from a religious standpoint, Heyck contends that Darwinian evolution was a greater blow than uniformitarian geology, as it both contradicted divine design and appealed to a Victorian sense of the world as changing and competitive (Heyck 85).

Political and aesthetic effects were also not inconsequential. As Fichman and Lightman have explored, and as troubles Levine throughout *Darwin Loves You*, natural selection is a leg on which not only Utilitarians but also many less savory political philosophies may stand. Yet, as all three writers note, natural selection is not an ideal support for many political platforms, focusing as it does on nothing but adaptation to immediate circumstance. The lack of stability inherent in a Darwinian world—in which the future is neither better nor worse but merely different from the past, in which temporal privilege is removed—was both an aesthetic and a philosophical affront, a concept Gillian Beer tackles in her seminal *Darwin's Plots*. More than this metaphysical concern, though, Darwin revealed to a society that loved its idyllic countryside—think of the mid-century hymn “All Things Bright and Beautiful”—that its picturesque reading rooms for God’s book were in fact realms of inescapable savagery, red in tooth and claw down to the microscopic level.

3. Vivisection

While Darwin provided a focus for debate, his work as a recorder and theorist lacked the cruel weirdness of the vivisection controversy. Animal and human vivisection was the center of a vigorous public debate on which Darwin himself commented in *The Descent of Man* (1871). In a passage in his third chapter, “Comparison of the Mental Powers of Man and the Lower Animals,” he writes a touching condemnation of animal vivisection, saying that only a scientist confident that “the operation was fully justified by an increase of our knowledge” or possessing “a heart of stone” could perform such work without remorse (Darwin 215). Public protest over animal vivisection eventually led to the Cruelty to Animals Act of 1876, which required experimentation involving any live vertebrates to submit an application for license from the Home Secretary, and an additional license was required should the experiment not be carried out under anesthesia to prevent suffering (Richards 152). However, using the Home Office’s own data, Stewart Richards demonstrates the steady rise in both the total number of experiments and the number of “potentially painful” experiments on living vertebrates (154). Richards provides good evidence that at least some labs did begin to put a higher price on the suffering of subjects. He also attempts to provide some explanation for the rise in experimentation by pointing to the first inspector employed by the Home Office to administer the Act, George Busk, and his successor, John Eric Erichsen, who made it policy to generally take operators at their word that

anesthetic protocols were followed as closely as possible and any suffering was “trifling” (155-56).

The arguably loose rein on experimentation gave the impression that the Act served more to catalog than to restrict while simultaneously protecting anatomists from persecution for cruelty under previous legislation (Richards 157-58). Antivivisectionists certainly believed so and viewed the handing of licensing over to a scientist—a compromise that was partially the result of lobbying by physiologists—to render the Act insufficient. If anything, the movement became more radical in response (Guerrini 90). This strengthened Frances Power Cobbe’s Society for the Protection of Animals Liable to Vivisection (later the Victoria Street Society and then finally the National Anti-Vivisection Society), which had helped draft the legislation, though the final version was deemed unsatisfactory. It was in such an atmosphere that Cobbe became determined to make David Ferrier the Dr. Knox of vivisectionists (Williamson 141-43).

It was Cobbe and her organization that brought Ferrier to trial in 1881 for unlicensed vivisections in his work on cerebral localization, experiments in which Ferrier produced lesions on the brains of monkeys to show that certain functions were carried out by certain areas of the brain. Cobbe had been combing through scientific and medical journals for vivisection experiments and matching her findings with Home Office records, which were public, and found no license for Ferrier (Williamson 141). Cobbe needed a test case with which to attack what she saw to be glaring loopholes in the Act. She needed a villain.

Ferrier’s work on monkeys as well as cadavers made the trial sensational, and his position as a firm materialist doubtless failed to endear him to the public (Stiles 69). Still, once it became clear that the experiments on monkeys had in fact been carried out by Gerald Francis Yeo, who had a license, the prosecution’s case evaporated. Nevertheless, while Ferrier continued his work, his name remained tied to the issue. That was, in part, because of Wilkie Collins, something I will return to at the end of this chapter.

4. Cerebral Localization and Materialism

The mind-body problem, how or whether an immaterial mind or soul could drive or even interact with a physical brain, has been an issue that has, as Robert M. Young says, “plagued the study of mind and behavior at least since Descartes” (2). Cartesian dualism was the position held by many in and out of the sciences, including most psychologists in the first half of the

nineteenth century (Stiles 51). Cerebral localization, the project to map the human brain by functionality, challenged this view and thus became a special scientific source of existential dread. Even proponents of Darwinism and a naturalist approach to psychology “felt themselves obliged somehow to reconcile traditional notions of free will and volition with the deterministic implications” (Daston 197).

The project threatened to reduce humans to the mere sum of their parts: automatons, predictable and programmable. The project was fruitful, at least in its medical efficacy. Ferrier, in his vivisection experiments in the 1870s on rabbits, cats, dogs, and monkeys, was not only successful in providing solid evidence for localization, but his cortical maps also became invaluable tools for surgery (Finger). “Automatists,” like T. H. Huxley in his 1874 essay “On the Hypothesis That Animals are Automata and Its History,” extended the mechanistic view of animals to human beings. While Huxley may have been one of those working to reconcile automatism with free will or at least establish that those concepts may not necessarily be contradictory, not everyone found this notion of parallelism convincing enough to be comforting (Stiles 51-53).

Part of what made localization and the whole notion of neurology seem oppressively mechanistic was that it was merely one aspect of a now quite demonstrably effective world view. Herbert Klein’s chapter on “The Mechanical Age” in *(Re) Creating Science in Nineteenth-Century Britain* observes how the mechanistic lens through which Bentham and the Utilitarians had approached civics and through which Darwin had so magnificently examined nature was now being turned to look not merely upon the human body but also through the soul. What is more, the scientific research confirming this view and making it productive was possible precisely because research was not completely dependent on moral concerns. Of course, morality was of interest to scientists, and not just for study, but Darwin’s own words above on vivisection demonstrate the potentially stark difference between what was appropriately moral research to a scientist and what seemed moral to a skeptical outside observer. Furthermore, as science and technology became more important socioeconomically as well as politically, those skeptical of its means and ends were understandably alarmed at where this newly powerful force might take them and their society.

The Hazardous Persona: Brilliant, Abnormal, Monomaniacal, and Amoral

In “Mad, Bad, and Dangerous to Know: Reality Overtakes Fiction,” Rosalynn Haynes gives Robert Cromie and his creation Herbert Brande in *The Crack of Doom* (1895) credit for providing “an early example of that combination of fanatical dedication to an abstract ideal, total faith in the benefits of science, and a lack of feeling for humanity that was to characterize many of the evil scientists in the twentieth-century” (193). With respect to Haynes, I would like to expand on that list of traits and to look earlier in the century for their use in creating a mad scientist character. The use of the resultant profile in analysis will reveal a spectrum of hazardous scientists, ranging from the merely perturbed to the out-and-out mad. This spectrum will further demonstrate a thesis of many of the most popular and lasting of these narratives: that it is crucial to the interests of society to support scientists and their work and also to encourage interaction and connections with scientists.

To reiterate Haynes’ list: 1) fanatical dedication to an abstract ideal, 2) faith in the benefits of science, 3) a lack of empathy for other human beings. In establishing my spectrum of hazardous scientists, I want to divide up traits somewhat differently: 1) brilliance, 2) abnormality, 3) monomania, and 4) amorality. I will briefly go over what I mean by each term before going more in depth with some explanation and a few examples. Of course, brilliance, specifically intimidating scientific brilliance, is a necessary element to an impressive scientist character. By abnormality, in both character and interest, I hope to capture a strangeness of personality I feel is missing from Hayne’s list as well as to specify that the abstract ideals of which she speaks tends to be outside the realms of accepted science. Monomania is the other side of this, the fanatical devotion that is tied to the final item, amorality, an outlook that expresses itself not only in the lack of empathy but also a disregard for social mores. I will elaborate:

1. Brilliance

Any hazardous scientist must be brilliant—intimidatingly so. Obviously, any hazardous scientist may hold notions that go beyond incredible into the ridiculous or have goals that are laughably impractical, e.g. a crank. However, they would probably not be threatening or heroic or even interesting if they do not also possess a formidable mind with an innate talent for scientific work.

2. Abnormality

A hazardous scientist often possesses peculiar personality traits but is also, scientifically speaking, abnormal. This is a double qualification, but the two sides are inseparable and combine to form the hazardous scientist's outsider status. Hazardous scientists generally operate on less the cutting edge than the fringes of science. This is partly a consequence of the genre of science fiction, aka speculative fiction, which has always been concerned with possible futures created by scientific advancement. It also relates to the Victorian notions of genius as a kind of imbalance. Hazardous scientists are bizarre people with bizarre interests. Critically, they are not just likely to be outsiders in society but also among the scientific establishment—the members of which were quite possibly the first ones to laugh at them and call them mad. Just as they are sometimes social outcasts on account of strange temperaments, mad scientists are often portrayed as being on the outs with their respective scientific communities because of their strange ideas. This is not just a function of ancient tropes picked up by Victorian psychiatry but also has to do with how we understand science itself to move. This is where I turn to Thomas Kuhn. Scientists, like Moreau, and Jekyll, and also Holmes and Van Helsing work not just in the uncertainty of the scientific frontier but at or beyond the edges of, as Kuhn would say, the prevailing scientific paradigm. In Kuhnian terms, they do not do normal science.

In Thomas Kuhn's seminal 1962 work *The Structure of Scientific Revolutions* (the fourth edition of which was released in 2012 on the fiftieth anniversary of the original), the philosopher of science proposed a cycle of scientific progress. In Kuhn's view, rather than continuous progress, science moves in fits and starts from paradigm to another, a paradigm being a set of concepts that makeup the core of a general understanding. Kuhn proposed that scientific work is done under a prevailing paradigm and, over time, experiences a cycle of "normal science" and paradigm shifts. Diagrams of this generally look like fig. 3, below:

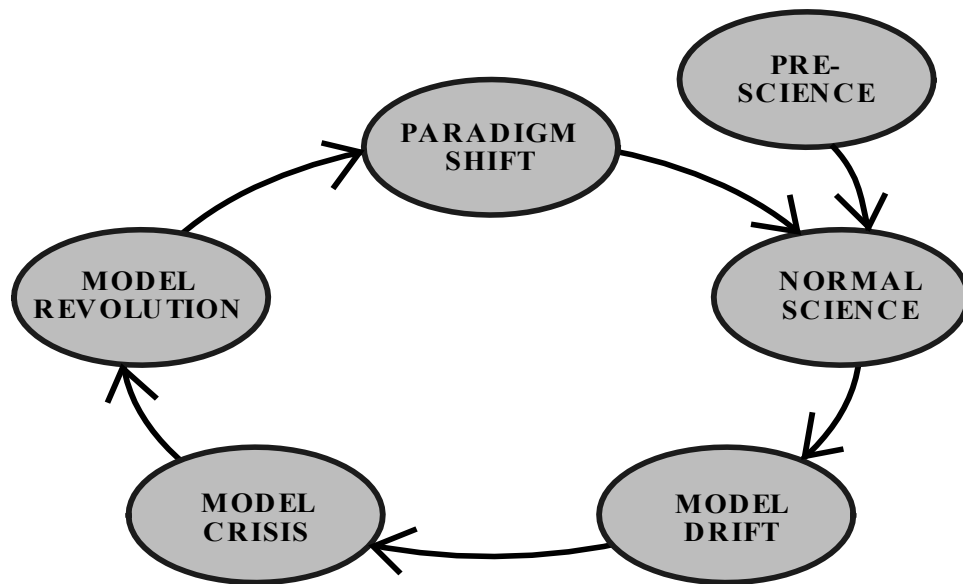


Fig. 3

The purpose of science under the paradigm, of normal science, is to demonstrate how the paradigm is true. Normal science is puzzle-solving; it uses the paradigm to explain what scientists find and attempts to account for the things that do not seem to fit the paradigm. One might imagine a scientific paradigm as a stone tower. Normal science installs structural supports within the tower, adds rooms, finishes the interior. Over time, anomalies build up. Normal science patches holes, maintains the support beams. At the same time, and this usually is not shown in the diagrams, there are scientists who do not believe the current paradigm is correct or sufficient and who are attempting to build other paradigms, other towers. They, or those within the tower, make discoveries that unsettle the big tower of the prevailing paradigm. These discoveries are anomalies too big to explain away, cannon fire that the tower cannot withstand. Eventually, inadequacies of the prevailing paradigm becoming impossible to ignore. The model drifts. The tower begins to sway. At the point of crisis, a new tower must be found. One tower collapses and the next most stable seeming tower becomes the new ruling paradigm. Normal science resumes in the new tower. Kuhn asserts that this is how new paradigms are chosen, not because they seem to be more true, but because they seem to account for the most threatening anomalies that have put the biggest holes in the old tower at the time when the old tower is collapsing.

A number of scientists have themselves thrown rocks at Kuhn's theory. Many are understandably insulted both by the implication that most science is nothing more than propping up of a paradigm and that science does not progress because it learns but rather reluctantly abandons ideas when it must. Kuhn also maintained that different paradigms are "incommensurable," that is not capable of being judged by the standards of other paradigms, i.e. that no paradigm is actually superior to another, just different. Because of this, he has also been taken as denying the existence or importance of an objective reality. Kuhn's view of truth is something that Steven Fuller occasionally discusses in *Kuhn vs. Popper*, and which Ian Hacking specifically addresses in the introduction to the 50th anniversary edition of *The Structure of Scientific Revolutions* in a section called "Truth." It is not really fair to say that Kuhn denies objective reality, only our ability to describe it. Kuhn's concept of incommensurability is meant to explain the impossibility for those working under different paradigms to exactly compare their work because they will not share the same standards or definitions for terms, and they will categorize phenomena differently. Kuhn also reminds us that fidelity to reality is not a goal universal to all paradigms. This leads to a definitional argument over whether a field without that goal could be called science. However, this argument is not important to my use of Kuhn.

Whether or not paradigms are incommensurable and whether or not shifts happen because new paradigms are more right or because old paradigms are collapsing, Kuhn gives us a handy way to think about scientific communities working together under a set of assumptions and the enmity that often arises between the main community working under one paradigm and those working without it. This abnormal positioning is typical of many mad scientists in particular and hazardous scientists in general. They are on or beyond the fringe. At times, this is complicated in literature by what a member of the reading public might understand as either fringe or advanced science, an understanding that may not match that of a contemporaneous scientist. And, of course, at times a new development or paradigm, like evolution, may be portrayed as extreme or ludicrous by social or scientific establishments. Nevertheless, a certain fringeness is common to the hazardous scientist.

3. Monomania

The hazardous scientist is intensely focused and fanatically loyal to an idea or project. Here, it may be helpful to think about Alain Badiou's "the Event" (with a capital E) and its

relationship to what he calls “Truth” (with a capital T).¹³ Badiou never mentions Kuhn, but there is a certain similarity between the concept of an event and a paradigm shift. It also bears some resemblance to the “moment of clarity,” as popularized by Alcoholics Anonymous. An event is an occurrence which destabilizes and reorders understanding. It is a brush with truth, one that does not make sense in the given situation and thus shakes the one who experiences it. Unlike Kuhn’s paradigm, Badiou’s concept of truth undeniably smacks of an external reality, but one that is too complicated to grasp by the individual experiencing it, the subject. The subject can only hope to carry from the experience a sense of the truth, one to which they must remain faithful. This fidelity to the truth is more important than exact knowledge. Badiou also asserts there are four “truth procedures”: art, love, politics, and science. The special inclusion of science is noteworthy, but it is fidelity that is important here.

Badiou is slippery, but examples from science fiction can help illustrate what he means by fidelity to the truth of an event. The best depiction I have ever come across of a Badiouan event is in Madeleine L’Engle’s *A Wrinkle in Time* (1962), one which likewise points to the importance of fidelity. Several times characters struggle with large scientific or philosophical concepts, but the two especially notable occasions are Meg Murray’s. The first is when she for a moment understands the tesseract and fifth-dimensional space. She exclaims, “I got it! For just a moment I got it! I can’t possibly explain it now, but there for a second I saw it!” (80) It is worth noting that the book’s explanation of a tesseract is flawed, but I am certainly no more qualified than L’Engle to explain it. Putting aside math, I think we have all had moments, of varying profundity, of understanding something for a moment and then losing it.

The second moment in the novel is even more profound because it is personal. It comes when Mrs. Who tries to explain to Meg her own strengths, quoting I Corinthians 1:25-28, which says that, in brief, God chooses the foolish, weak, and even nonexistent to confound, defeat, and bring to nothingness the wise and mighty. Before she quotes the Bible, Mrs. Who tells Meg, “you must try to understand not word by word, but in a flash, as you understand the tesseract” (207). If you have read the book, the meaning is clear. As with the previous time Meg went into danger, when Mrs. Whatsit’s told her that her faults would be useful, Mrs. Who is telling her that

¹³ Alain Badiou’s *Being and Event* (1988) is a fascinating read that has spawned not only *Badiou’s Being and Event: A Reader’s Guide* (2009) but is a major focus of a book dedicated purely to Badiou’s terminology, *The Badiou Dictionary* (2015). For this dissertation, Žižek’s *Event: A Philosophical Journey Through a Concept* (2014) was a conceptual assistance.

her imperfections, her human failings, hold the key to her success in fighting the book's villain, a massive intellect which rules the alien planet to which Meg has been brought. In instructing Meg not just to listen to the words, Mrs. Who is attempting to go beyond "understanding the meaning" of a quote. The point is to give Meg the profound experience of encountering a Truth-with-a-capital-T, a truth she can rely on, pursue, and desire to embody. Meg eventually takes her fidelity to this truth and uses it to destabilize the (oppressive) government of an entire planet.

This is the essence of the monomania of the hazardous scientist. It is not just an obsession with an idea but with the pursuit of a truth, with the fidelity to a truth that takes precedence over other, more social and moral concerns. Crucially, the truth in question, unlike Meg's truth, might be more morally neutral, even socially destabilizing or dangerous to others. Thus, the hazardous scientist's fidelity to truth is often the cause of their somewhat amoral nature.

4. Amorality

The hazardous scientist is often amoral rather than simply immoral—a moral distinction that was just being made in the late nineteenth century. The concept of amorality is also an important one to the mad scientist because of its relation to a mechanistic outlook. The concept of amorality as a part of or function of materialism has its roots in Victorian writing. Robert Louis Stevenson, apparently coined the word in an 1882 essay in *Longman's Magazine*, reprinted in his memoirs. The passage follows after an assertion that "drama is the poetry of conduct" and "romance the poetry of circumstance":

There is a vast deal in life and letters both which is not immoral, but simply amoral; which either does not regard the human will at all, or deals with it in obvious and healthy relations; where the interest turns, not upon what a man shall choose to do, but on how he manages to do it; not on the passionate slips and hesitations of the conscience, but on the problems of the body and of the practical intelligence, in clean, open-air adventure, the shock of arms or the diplomacy of life. With such material as this it is impossible to build a play, for the serious theatre exists solely on moral grounds, and is a standing proof of the dissemination of the human conscience. But it is possible to build, upon this ground, the most joyous of verses, and the most lively, beautiful, and buoyant tales. ("Amoral," Stevenson 217-18)

It is debatable to what measures any of these characterizations are either enlightening or reductive, but the fact remains that writers of the time, including one of those engaged in science fiction and the writer of a preeminent mad scientist narrative, were trying to explain this category

defined by a lack of regard for moral distinctions. Materialism and empiricism were ascendant in the nineteenth century, and the materialistic and empirical science of the day was criticized for such a lack of regard for moral concerns in the search for truth and fidelity to truth found. The major public scientific debates of the Victorian era revolved around the question of how far they could and should be taken as ways of learning about and understanding the universe and humanity. It should be no surprise then that the mad scientist, as a product of the time, should show his monstrosity of soul in an absence of morality.

There were, by contrast, decidedly immoral mad scientists in the literature of the day, villains who pursued goals of conquest or destruction and who used science as their means. Haynes, in her chapter “Mad, Bad, And Dangerous to Know” has a section called “Power Maniacs and World Destroyers,” but even here a great deal of the mad scientists in question have a lack of care for moral questions in the pursuit of science rather than plot to use scientific work to specifically immoral ends: e.g. holding a city hostage with a threat of a death ray or other scientific terror, and that is the point. With some exceptions, villainy comes from caring more about scientific understanding than about human life or morality.

Pilot Study: Dr. Benjulia

Let us look at an example, one that helped set off the flourish of mad scientist novels in the late nineteenth century, Wilkie Collins’ *Heart and Science* (1883). Collins’ novel has not had the staying power of the works I will be focusing on in this study. It also departs from the others by genre. While *Heart and Science* does feature a mad scientist, Dr. Benjulia, it is more a critique of scientific practices, specifically vivisection, wrapped in a sensation novel than it is speculative or science fiction. Benjulia is not even responsible for the story’s significant scientific advancement, which happens out of scene and via normal science. This is critical. Collins was drawing less on authors like Shelley or Verne or other authors of speculative fiction than he was responding to the vivisection debate and specifically to the aforementioned trial of the vivisectionist Dr. David Ferrier.

Collins outlines his goals in his preface to the novel, in which he promises his readers good characters and humor but also asserts that his novel has a point. In fact, he has four: you can have too much of a good thing; science is not so great anyway; science hardens the heart; and humility is of supreme importance. Before the story has even begun, Collins has attacked

brilliance, or scientific brilliance anyway, and insinuated that science naturally induces amorality and, if not specifically monomania, then certainly hubris. We are off to a good start. Collins also makes clear in his prefaces that his novel is an attack on vivisection, and, in his efforts to demonstrate his research and commitment to realism, he credits both the Surgeon-General C. B. Gordon and Frances Power Cobbe. Collins also specifically mentions Ferrier.

Collins shared a goal, along with Cobbe, to discredit vivisection. This is one reason why the work could not be science fiction. It was critical to Collins that one of the “secrets of Vivisection” he would reveal to his audience was that it was unnecessary for advancement. In his correspondence with Cobbe, Collins said that he sought to identify the social causes for scientific cruelty (Cobbe 558-59).

So, we are well on our way to fitting *Heart and Science* with both our goals, placing Benjulia on our spectrum of hazardous scientists for which socialization is a key component and showing how the narrative is a thought experiment working out how to deal with a hazardous scientist. Even before we meet Benjulia, the good doctor seems likely to exemplify the traits of those on the mad/hazardous scientist spectrum. In addition, though we cannot yet say whether Collins is pro or anti-ostracism, he is definitely interested in social causes and perhaps remedies to mad science. At this point, some summary is helpful.

Doctor Benjulia is a focus, but not the protagonist or even primary antagonist of *Heart and Science*. The principals are a virtuous doctor, Ovid Vere¹⁴ and Carmina Graywell. Ovid and Carmina meet when she catches his eye and then faints. They quickly fall in love, as pretty young people should in sensation novels, but, as also happens in sensation novels, there are older relatives standing in the way. Ovid’s mother, the commanding Mrs. Gallilee (remarried) is, despite her religious name, decidedly more of the hard-hearted scientific persuasion than a compassionate Christian. Among her other extravagances, she supports scientific committees. Carmina, we learn, is Mrs. Gallilee’s ward. Mrs. Gallilee discourages their relationship because if they marry then she will not get the allowance from Carmina’s inheritance. Ovid takes Carmina to the zoo along with his little sisters and their governess Minerva, and this is where we

¹⁴ Interestingly, Ovid Vere's last name, related to the Latin *verum* meaning truth or honor, literally means “sincerely.” Ovid itself comes from the Latin for “sheep,” references to which carries religious as well as social implications. This name and its shades of meaning signify the good doctor's morality traditionalism.

first meet Dr. Benjulia, a vivisectionist acquainted to Mrs. Gallilee through her scientific funding.

On his mother's advice, Ovid takes a trip to Montreal. While Ovid is away, Mrs. Gallilee hears a rumor that Carmina is illegitimate, which may enable her to get ahold of Carmina's money. This turns out to be false, but the shock of the accusation gives Carmina a nervous breakdown. At this point Dr. Benjulia, who is a specialist in brain and nervous disorders, particularly ones that flummox most other doctors, is called in for Carmina. However, rather than treat her, he prefers to watch her condition deteriorate in the interest of scientific curiosity.

To save the day, one of Ovid's sisters sends him a letter to bring him back from Montreal. When Ovid returns, he treats Carmina with knowledge he gleans from a manuscript he picked up in Montreal, written by an anti-vivisection doctor. After Carmina recovers, Ovid publishes his own work on this treatment. At this point, Benjulia realizes his cruelty has been for nothing. He dismisses his servants, sets his animals free, poisons himself, and, as his last act, sets fire to his laboratory with himself in it. Ovid and Carmina marry, and, ending on an ominous note, Mrs. Gallilee leaves her family to hobnob with scientists.

Just from the summary it is clear that Benjulia is on our spectrum. He is brilliant, or at least notably intelligent, and possesses both scientific monomania and amoral detachment. He is perfectly willing to watch Carmina die in order to learn from the results, just as he has no qualms about vivisectioning animals. In Badiouan terms, Benjulia has chosen his specific truth procedure. Indeed, he believes he has understood something that is true, that vivisection will lead to discovery. Benjulia's fidelity to this understanding, to this search for truth, is so complete that, when he learns it is not so, his world is shattered beyond repair. This is, of course, Benjulia's actual event, his brush with truth. True to his character, once he encounters it, Benjulia is utterly faithful to this event. In demonstration of his regret and his new fidelity to the sanctity of life and importance of compassion—before he frees his animals, commits suicide, and burns his lab—Benjulia sends his few servants away with a month's pay each and leaves all his money to Zoe (Zo), Ovid's adorable younger sister. But that is leading us to social connections. What about Benjulia's status as a scientist from a Kuhnian perspective, and what about his social connections? What is Collins' commentary on the social component of mad science?

Apart from his somewhat avuncular relationship with Zo Vere, Benjulia is predominantly portrayed as an outsider, and his ghastly physical appearance reflects that disturbing position.

Benjulia is not named until he is first described as an unnamed stranger, and the description borders on the ghoulish. Benjulia—his first name, Nathan, is used only a handful of times in the novel—is “miserably” and “hideously” thin. We are told that “his enemies spoke of him as ‘the living skeleton.’” His forehead is “massive” above his “gloomy grey eyes.” His face is “fleshless” (95). This gaunt form is wrapped in loose-fitting clothing. He is, we are told, well known in scientific and medical circles, but he is certainly not universally liked. Collins also uses racial coding to mark Benjulia’s difference. His complexion and his name “revealed his gipsy origin,” and his hair is likened to that “of an American Indian” (95). Benjulia does also have a brother, Lemuel. Lemuel and his wife are anti-vivisection, and the pair are estranged from Benjulia.

Soon after, we learn from Ovid that Benjulia is a specialist, and one that seems to work entirely alone. Benjulia’s brother is the only person aware of his vivisection experiments, and Benjulia threatened Lemuel with death should he reveal it. His lab is set apart even from his own house. Benjulia’s house is “in the middle of a barren little field” and the laboratory is “some two hundred yards away,” off to the side of the middle of nowhere (129). The laboratory does not even have windows, only a skylight, and Benjulia cleans it himself. Benjulia’s work seems to have no discernable benefit to society. He has stopped seeing patients, and when Ovid asks if the world will ever hear of his discoveries, Benjulia replies, “Damn the world!” (101). Benjulia has little interest in the world or in sharing his work with it. Socially and professionally, Benjulia is isolated. There does not seem to be a hint in the text that this is anybody’s fault but Benjulia’s, but the isolation itself does seem to be a cause or at least a sign that something is or has gone wrong with the doctor.

It is difficult to say whether Benjulia is doing normal science from a Kuhnian perspective. Collins, as he promises in his preface, never takes us inside Benjulia’s lab. However, he is not in the tower with the other scientists. Though he occasionally shows himself at Mrs. Gallilee’s scientific gatherings, he is isolated professionally as well as socially. The only information we get regarding peers who share his goals comes after Benjulia’s death, when his funeral is attended by “large numbers” of other vivisectionists, Benjulia’s “brethren of the torture-table,” to whom he is a martyr (324). These shadowy figures, along with the unsettling gathering of unnamed scientists around Mrs. Gallilee at the end, are necessary to convey the threat of which Collins is trying to warn his audience.

Collins needs to portray Benjulia's work as not only wrong but also tainted with a wrongness that all good people should be able to feel. At the same time, Collins wants his audience to fear that science is going in a terrible direction. He must portray Benjulia as part of an emerging normal that must be stopped. In Kuhnian terms, Collins' goal is to separate Ferrier's work from normal science, to influence public perception and consequently muster the public pressure necessary to force the scientific community to sever itself from vivisectionists, and to get everyone to see vivisection as fringe science.

That is ultimately Collins' social solution to Benjulia, or rather a preventative measure to keep more Benjulas from cropping up. Of course, the reader is meant to see Benjulia as being in the wrong, but the message is not simply that Benjulia must be corrected and punished. Rather, society and Benjulia need to do more to better accommodate each other. We are seeing an argument that the solution to mad science, the way to deal with hazardous scientists, is social and that a lack of social ties is a cause, or at least a symptom, of mad science. Other authors, many of whom were more scientifically inclined, would have more to say on the topic—as will I, in the chapters to come.

CHAPTER TWO—BONDS OF COMMON INTEREST: JEKYLL AND HYDE



“Hang on! I’m changing!”

The Strange Case of Dr. Jekyll and Mr. Hyde (1886) is a textbook case of mad science and a nexus point for any discussion of the mad scientist. Stevenson’s distillation of the figure has left an indelible mark. Of the array of late Victorian mad scientists, *Jekyll & Hyde* has entered into the lexicon like no other, and any discussion of the mad scientist must come to this story. And yet there is so very little science in it. There are trappings of science in Stevenson’s science fiction story, with its phials of tinctures, papers of salts, and “glazed presses full of chemicals” (89) but there is no real discussion of science as it operates. Instead, the focus is on what science may reveal. *Jekyll & Hyde* is far more about personal than chemical bonds, and far more of the action takes place in the dining room or even through conversations in the street than in the laboratory. In *Jekyll & Hyde*, science is not observed except in its capacity as a truth process, a means by which an event can be reached. Only the truths revealed in such events and their effects are of interest, and those truths and effects are not matters of the laboratory. Surprisingly, despite the apparently intensely personal nature of Jekyll’s work tinkering with his own psyche, the real truths here are social. *Jekyll & Hyde* focuses on the strained social network

of middle-class London gentlemen and demonstrates the necessity of networking as a way to prevent mad science. It simultaneously reveals the inadequacies of contemporaneous networking. In a fittingly doubled action, the dysfunctional nature of Jekyll's social network both creates and limits the space for the narrative and thus for Jekyll's mad science. *Jekyll & Hyde* is remarkable for this particular study because the nature of Jekyll's loneliness and the inseparable dysfunction of his social network facilitate Jekyll's slide into mad science. In fact, social dysfunction brings about this slide—and ends it.

Jekyll, like all mad scientists, is to varying degrees brilliant, abnormal, monomaniacal, and amoral. With his genius and fanatic devotion to rid himself of guilt over his dual nature, he accomplishes something truly incredible: the freeing of his Hyde persona, the embodiment and distillation of his personal abnormality. As a scientist, his work is itself abnormal, and Jekyll's lack of concern for the result belies a certain amorality. Like his brothers in mad science, he is more interested in his own truth than in the disruption it may cause. However, Jekyll's work is not the reason he isolates himself. Rather, Jekyll conducts experiments in isolation because he is shy and insecure. Jekyll's desire for reputation, for the esteem of those in his social network, combined with a rigid and emotionally distant standard of friendship—and a perhaps exaggerated fear of judgment—drive Jekyll to seek escape from his anxiety in Hyde and also cripple his connection to his social network. Meant to provide a relief for his anxieties, Hyde only exacerbates his unhappy solitude. The paradoxically social and professional nature of Jekyll's internal struggle is central to the novel, and its resolution hinges on Jekyll's unstable relationship with his social network. His associations, though poorly maintained, are instrumental in ending *Hyde's* terror. At the end of the novel, the continued presence and affection of Jekyll's circle of friends, however defective that circle may be, is what prompts Hyde to end his life.

But before we get to the end of Hyde's life, let us consider first its foundations in the scientific, medical, and sociological thought of the Victorian period. Anne Stiles locates Jekyll's experiments within the larger context of nineteenth-century psychiatry and neurology, arguing that "Stevenson's novella does more than merely reflect the case studies upon which it is loosely based. Instead, *Jekyll and Hyde* creatively intervenes in late-Victorian debates about dual personality and its alleged cause, bilateral brain hemisphere asymmetry" (Stiles 29). This places *Jekyll & Hyde* in the midst of one of the major debates discussed in my first chapter, cerebral

localization. In Stevenson's narrative, chemistry is shown to have the power to unlock and even free not just mental states but aspects of personality. The mind is chemical. For the purposes of this chapter, however, I am more interested in the novella's commentary on *social* chemistry.

As we saw in Chapter One, professionalization and specialization were driving needs for scientific advancement in the nineteenth century, as were secularization and materialism. By the end of the century, British universities had been somewhat reworked on the German model, becoming more secular, more critical of past standards by which information was judged, and more interested in at least supposedly objective standards of truth. T. W. Heyck discusses these changes as part a growing "theme of alienation" dominant in intellectual life and society in the late nineteenth century, a theme he links to specialization and professionalization (224). Essentially, Heyck argues that the English proclivity for the division of labor assisted in all of these things that both tied together thinkers—and specifically scientists—while simultaneously isolating them to some degree from the rest of society and even from each other. At the same time, many academic scientists "sought to rise above middle-class status by positing the existence of a higher plane of existence, the circle of high culture, which they took as their duty to tend for its own sake" (224). Jekyll reflects less the anti-bourgeoisie aspect of this sentiment than its snobbism. Moreover, the text displays the push and pull between intellectual sequester and the social network that is necessary both for division of labor and the existence of any sort of class structure.

England at the end of the nineteenth century was very much in flux. Scientific and technological changes were tied both to an evolution in the approach to religion and to new opportunities for the accumulation of wealth and status. It is no surprise that these changes coincided with a preoccupation with degeneracy that affected the sciences as certainly as it affected the arts. In such an atmosphere, bonds between gentlemen were crucial to gentlemanly status, which was as much a matter of reputation as finances. Indeed, anyone could have money—but a gentleman must have respectability. The more attainable the former, the more necessary the latter becomes in distinguishing the right type of man. Specifically in the sciences, making such distinctions was becoming increasingly difficult as over the course of the nineteenth century science became increasingly accessible to the masses. It is worth noting that the premier popularizers of nineteenth-century science—men like Thomas Huxley, John Henry Pepper, and

especially Michael Faraday—came to that status from a variety of middle and even working-class backgrounds.¹⁵

In this late-Victorian world of scientific and social change, the mystery of Hyde unfolds. Indeed, it feels important to remember that before it was the most widely known Victorian narrative about mad science, before “Jekyll and Hyde” was a dead metaphor for human duality, *Jekyll and Hyde* was a mystery story told from the perspective of Gabriel Utterson, who attempts to puzzle out the exact nature of the relationship between his friend Dr. Jekyll and the shadowy Mr. Hyde. Here is a refresher on the plot, the outline of which makes clear the extent to which relational, social bonds are both the structure and the content of the narrative. The novella opens with Gabriel Utterson walking through London with another friend, Richard Enfield. Enfield tells Utterson of an incident he witnessed in which a grotesque man bumped into and trampled a young girl. Enfield says he forced the man to pay the girl £100 under the threat of scandal, and learned his name, Hyde. This troubles Utterson, since his friend Dr. Henry Jekyll has recently changed his will to make Hyde his sole beneficiary. Utterson brings his concerns to Jekyll, but Jekyll says he can be rid of Hyde whenever he likes. Utterson also visits their mutual friend Dr. Hastie Lanyon, but it seems Jekyll and Lanyon have had a falling out over Jekyll’s strange ideas and rarely see each other anymore. In fact, Jekyll seems to have generally withdrawn from society. Sometime later, Hyde is seen beating a man to death, the much beloved, elderly Sir Danvers Carew. Jekyll swears to Utterson that he is done with Hyde, and, for a while, Jekyll is sociable again and holds dinners as he used to do. Then, suddenly, he closes himself off entirely. Lanyon dies after receiving some sort of shock, leaving Utterson a note to be opened after the death or disappearance of Jekyll. Utterson makes some attempt to revive a relationship with Jekyll without success. Sometime later, Jekyll’s butler comes to Utterson in a state of desperation saying that Jekyll has been shut up in his lab for at least a week. Utterson proposes that perhaps

¹⁵ Bernard Lightman’s book, which I have referenced earlier, *Victorian Popularizers of Science*, includes material on all of the above and more. Faraday himself does not get more than a few mentions, despite being regarded, Lightman notes, as “the finest lecturer in science in London” (372). Perhaps this is because Faraday died in 1867 and that was some years before he gave his last Christmas lecture, so he was not present for some very interesting decades, scientifically speaking—or the boom in mad scientist novels that concerns this dissertation—but Faraday’s impact on science and technology as well as the public enthusiasm for science should not be undersold. Of the recent biographies of Faraday, *The Electric Life of Michael Faraday* (2006), written by Alan Hirshfeld, a physics professor at UMass Dartmouth, is useful for the descriptions of his work and his experiments. *A Life of Discovery: Michael Faraday, Giant of the Scientific Revolution* (2004), later *Faraday: The Life* (2005), by James Hamilton, a biographer and art historian, is more interested in Faraday’s working-class origins and how he rose from serving under Humphry Davy to scientific prominence.

Jekyll has contracted a disfiguring disease, but Poole believes Jekyll is already dead, and they both become convinced that the person in the lab is not Jekyll but Hyde. Against Hyde's pleas, they break down the door—only to find Hyde dead by suicide. Next to the body, Utterson finds a letter addressed to himself. It is only then, reading the letters from both Jekyll and Lanyon, that Utterson comes to understand that Hyde *was* Jekyll, that the shock of this discovery killed Lanyon, and that Jekyll had lost control over his experiment and his once secondary persona. The novel ends with the conclusion of Jekyll's note.

As this chapter shows, *Jekyll & Hyde* proffers by way of negative example a theory of social and professional networks as the best guard against the abuse of science. I will first examine Jekyll himself—as a professionally trained scientist, as a social creature, and finally as Hyde. I will then discuss his two most important friends: Utterson, the friendly but preferably disengaged lawyer who saves London but not Jekyll, and Lanyon, Jekyll's highly engaged but rigidly conventional fellow doctor who first understands the danger they face but cannot survive the knowledge. Through these friendly and professional relationships, the novel demonstrates not only the necessity of social bonds, but also the need for those bonds to be both elastic and intimate.

Dr. Jekyll, the Philosophical Scientist

Jekyll is a character of disassociation, not just psychologically but also socially. Jekyll's internal conflict manifests barriers to professional as well as social networking, and, as a consequence, Jekyll manifests Hyde to get around those barriers. Jekyll describes himself as “born...to a large fortune” and “fond of the respect of the wise and good among my fellowmen,” which he supposes ought to be “every guarantee of an honourable and distinguished future” (103). Jekyll believes in the power of status and the motive of respectability. The respectability with which birth has graced him has been the chief concern of his life. Paradoxically, he becomes extremely reluctant to engage socially lest he risk that same respectability. Whether this division between Jekyll's inner and outer self is underplayed in his letter or truly as comically minor as it seems, his obsession with it is inextricable from his minimal professional and social networking and the poor maintenance of his social connections.

From Jekyll's education and professional memberships, as well as the relationship with Lanyon that I will discuss later, Jekyll clearly had access to scientific and medical networks, and

yet seems to have felt himself unconnected from his peers first personally and eventually with regards to his field. Jekyll is a scientist with all the education, knowledge, abilities, and connections of a professional, all the many trappings of professionalism—except, of course, for a job. His use of science is not directed by economics any more than by national interests or religious instruction. Jekyll’s scientific study and experimentation are entirely for his own ends. Jekyll’s self-interested approach to knowledge is on display in the listing of his credentials, which both provide him with access to professional circles and speak to his disdain for the commercial concerns that shape professional ambition. Jekyll is not merely Dr. Henry Jekyll, but Henry Jekyll M.D., D.C.L., L.L.D., F.R.S. The last of those signifies his membership in the Royal Society, but, regardless of professional relationships, Jekyll’s three doctorates signify him as a professional student only, a collector of degrees. According to the will he has entrusted to Utterson, his list of honorifics is: M.D. (Medical Doctor), D.C.L. (Doctor of Civil Law), L.L.D. (Doctor of Laws), and F.R.S. (Fellow of the Royal Society). The two law degrees suggest that Jekyll attended at least two separate universities over the course of his education—one assumes Oxford and Cambridge. With his baccalaureate studies, we can guess that Jekyll spent at least something like fifteen years in the university system.

Jekyll is shown as a student of science rather than a practitioner of medicine. Jekyll makes no mention of any measurable contribution to science or humanity by the time of the novel, by which point, as he puts it, he has “reached the years of reflection” (103). There is no mention of patients or clients outside of one vague passage referring to the time when Jekyll has sworn off his concoction. He refers to his work as “the furtherance of knowledge” and “the relief of sorrow and suffering,” but he gives no suggestion as to how his work would benefit others, or anything more than this merest lip service to the notion that medical or social concerns had anything to do with his work (117). It seems likely that for possibly the totality of his career as a scientist, Jekyll’s primary concern has been “the mystic and transcendental,” what he calls “transcendental medicine” (104, 105).

In other words, Jekyll’s desires to use science to find transcendental truths make him not only a mad science in the Badiouan sense but eventually make him a mad scientist from a Kuhnian perspective as well. Like other mad scientists, Jekyll is actively resisting “normal science” in order to seek not only a potentially destabilizing novelty but also a Badiouan encounter with truth, one that, in his case, he hopes will alter the way he and the world relate to

each other. He is not just monomaniacal but egomaniacal. His choice of words invites the inference of a religious or at least spiritual altruism among his motives, yet the only object of Jekyll's scientific study that he mentions is himself, and the relief of his own suffering appears to be his singular scientific aim, just as his only legal work spoken of in the novel is his own will. His entire approach to science is self-motivated and self-centered, and the only thing he seems to attempt to transcend is his own disquiet over his less respectable impulses.

The nature of Jekyll's formal scientific socialization, his membership in the Royal Society, is in line with a scientist engaged in abstract and inwardly focused work and suggests a concern with social status more than social activity. It was the Royal Institute, the prodigy of Faraday and Tyndall, that encouraged involvement. In his *Social Change and Scientific Organization: The Royal Institution, 1799–1844* (1978), Morris Berman discusses the rise of the RI and the stagnation of the RS. As further noted in Andrew Ede and Lesley Cormack's *A History of Science in Society*, by the late nineteenth century, the RS had become essentially a club (224). The RI took it upon itself to foster not only the application of scientific knowledge on grand scales but also the cross-class transference of knowledge. While the RI certainly had gentlemen, the RS was the gentlemen's club. Jekyll's RS membership is perfectly in line with the image of a man clinging to rather than expanding his social network, and also that of a man more interested in affect than effect.

Jekyll's lab space is equally fitting for a professionally solitary figure. Jekyll's laboratory is in a connected but separate building, and he secludes himself on the second floor where he has done much of his work. At first this might seem to reflect the classic dilemma of the urban scientist laid out in de Certeau's "Walking in the City" (de Certeau 91-93). The scientist wants the clarity of the view from above and yet knows that this view is incomplete, even illusory, that no real observations can be made without getting down there in the thick of it. And yet, in the thick of it, how does the mind hold onto its map of the whole? It is the cosmopolitan twist on the ancient quandary of the observer effect. But then, unlike, say, 221B Baker Street, which we will visit later, Jekyll's laboratory window overlooks not the street but a courtyard. Jekyll is not really invested in this dilemma because he is not truly connected with solving the problems of working within the prevailing paradigm as a doer of normal science would be.

Like Jekyll, his house and his laboratory have become disconnected from their social associations. Jekyll's home is the only fully occupied residence on a square of "ancient,

handsome houses,” which have now mostly been split into apartments and rented out to a host of disreputable types (52). Jekyll’s house has also become scientifically disconnected in his occupation. We are told that Jekyll purchased the house from “the heirs of a celebrated surgeon,” who at first seem likely to have used the space to either see patients or perfect their craft in dissections, given that it is still “indifferently known as the laboratory or dissecting rooms” though Jekyll’s interests are “chemical rather than anatomical” (65). We learn that it includes a “theatre, once crowded with eager students and now lying gaunt and silent, the tables laden with chemical apparatus” (65). So, it was a place not only of public practice but of scientific contribution through medical instruction.¹⁶ Jekyll’s work there, however, has been on and for himself. Even the generally uncritical Utterson, Tabitha Sparks reminds us, is critical of the lack of “usefulness” of Jekyll’s experimentation (Sparks 112). Jekyll’s lab is the perfect space of a scientist who is truly uninterested in others.

As a scientist, Jekyll rides a line traced by Jim Endersby regarding the use of “philosophical” to describe scientists who fall between the amateur and the professional, a class of formally educated and respectable men, such as Joseph Dalton Hooker, who made up a great number of the members of scientific societies (Endersby 261-62). The philosophical or “transcendental” scientist exemplifies what Gwen Hyman suggests is the real fear of the middle class: that they are neither gentlemen nor workers, that while they are safe from material want and yet constructed by and for their professions (179). In other words, it is a category that can produce scientists unchained by the obligations to run or to serve society who feel free to serve only the whims and quirks of their particular personal interests. This sentiment is a witness to the importance of socialization. Jekyll’s concern for his reputation, the desire to be respectable, is the driver of his morality. It is also the enemy of his work.

Jekyll and the Failed Symposium

As the egocentrism of Jekyll’s longtime scientific interests is directly tied to his social deficiencies, it should be no surprise that the progress of his work means a deterioration of his social relationships. The further he goes on his inward journey, the further he gets from others.

¹⁶ Crime writer Ian Rankin, in a BBC documentary on Stevenson’s novella, argues that Jekyll’s house is meant to be that of famous Scottish surgeon John Hunter, who acquired a great deal of fame and dissected a great many cadavers in London (Rankin).

Notably suffering are his friendships with other gentlemen. These are the sorts of relationships that, for a Victorian gentleman, would be necessary to signify and even maintain a moral character and a sense of communal responsibility. Utterson, who is one of Jekyll's two oldest friends, spends the first two chapters of the novel attempting to gather information on Jekyll's relationship to Hyde, perturbed partly that someone should be so important to Jekyll should be so unknown to himself. In the process, he finds that Jekyll's other oldest friend, Lanyon, has also not seen Jekyll in some time. The narrator comments that it is "the mark of a modest man to accept his friendly circle ready-made from the hands of opportunity; and that was the lawyer's way" (38). That seems to have been Jekyll's way as well, for his personal social network, similar to and overlapping with his professional one, was also acquired by virtue of being a gentleman and an academic—Utterson and Lanyon both being "old mates both at school and college" (47). That two of Jekyll's closest friends are also his oldest friends should be no surprise, but when one has lost touch with him and the other is ignorant of that fact, it suggests that the man in question has become withdrawn. This is to say nothing of the dubious distinction of having Utterson as his closest confidant. Utterson, we are told, is frequently "the last reputable acquaintance and the last good influence in the lives of down-going men" (37).

After meeting Lanyon, Utterson spends an unknown number of nights hunting for Hyde, and then it is a further two weeks before "by excellent good fortune" he sees Jekyll again, hosting a small dinner party for "five or six old cronies, all intelligent, reputable men and all judges of good wine" (56). The text tells us that this is not a singular event, but "one of his pleasant dinners," and yet it must be uncommon if Utterson has not seen Jekyll since he first heard of Hyde (56). The dinner is a significant event in the novel, as it is the first time we see Jekyll as Jekyll and a rare instance in which we see Jekyll happily socializing. The other dinner, unsurprisingly, comes after the murder of Sir Danvers Carew, when Jekyll has resolved never again to become Hyde.

This dinner is also a failure, both Utterson's and Jekyll's, on an intellectual as well as emotional level. Hyman, who calls Jekyll's potion "the century's most complicated homebrew" (169), examines at length consumption in *Jekyll & Hyde*. She likens the communal consumption of wine to a Eucharist, an opportunity for the men to transubstantiate or "melt"—a word she points out Stevenson uses multiple times (Hyman 180-84). The comparison to the Eucharist is apt, and Hyman rightly calls these attempts at Eucharists failures because the men are unable to

establish an effective community and Utterson and Jekyll fail to establish an effective bond. However, wine offers more paths to connection.

Wine can, as Hyman says, bring out humanity (180). In the first lines of the text, we are told that it does this for Utterson: “when the wine was to his taste, something eminently human beacons from his eye” (37). The line puts one in mind of the tiny cupids flying in the eyebeams of lovers in Spenser’s *Amoretti*.¹⁷ The intellectual and emotional transubstantiation Hyman is discussing is about the dissolution of boundaries between the men, allowing for intimacy that is clearly lacking in a book in which men can only discuss the most important facts of their lives through letters delivered after their death. While Communion is certainly a communal act, it is not exactly a party. Further insight could be gained by comparing these gatherings to another equally ancient and equally culturally influential drinking tradition, the symposium, and particularly to Plato’s Symposium.

The symposium is meant to offer something the Eucharist is not, something these men are missing: communal intellectual and philosophical progress. The failure to forge a community is not just because they cannot truly let down their guard. They do not commune intellectually any more than they do emotionally. Their dinners are “pleasant” affairs, after which hosts often prize Utterson’s quiet company, which is likened to “practising for solitude” after the “strain of gaiety” (56). The gentlemen share their space, but not their minds.

The Symposium, perhaps the most famous drinking party in history, is a narrative of wine as an excuse for a discourse not just on love but on the duality of human nature. If only Jekyll could explore his thoughts about such matters with companions! The comparison highlights precisely what is terrifying about professional and philosophical scientists: their exclusivity. What is more, Stevenson makes it clear that this is not just a problem with scientists but with middle-class men. The men’s middle-class reserve prohibits not only deeper intimacy but also philosophical conference. We do not get any suggestion that the men at these dinners speak of philosophical matters any more than they bond emotionally. The men who make up this circle of friends seem to be intellectuals, but there are no shared revelations, no intellectual adventures, which is how one would expect a community of intellectuals to cement itself. Instead of

¹⁷ Of course, this is an expression of and interaction with humanity that Utterson often denies, even damages his ability to partake in, something we will discuss in a further section.

conferring with others, Jekyll takes all his intellectual adventures alone, and to disastrous ends for at least several people.

Hyde: A Side, Not an Opposite

And so, with professional and personal detachment combined with undissuadable scientific purpose, we get mad science, and Jekyll gets Hyde. In discussing the manifestation of Hyde, it is critical to remember that Jekyll, pitiable as he is, is not the light to Hyde's dark. He is duplicitous by nature, and that duplicity gave birth to Hyde rather than the other way around. Money, education, and friendship are all gifts of Jekyll's birth, but the way he discusses his life, he seems never to have let himself enjoy them. Jekyll characterizes himself and his greatest fault as having "a certain impatient gaiety of disposition, such as has made the happiness of many, but such as I found it hard to reconcile with my imperious desire to carry my head high, and wear a more than commonly grave countenance before the public" (103). As a result, Jekyll "concealed his pleasures," even ones he asserts many would have readily forgiven, and "when I reached years of reflection, and began to look round me and take stock of my progress and position in the world, I stood already committed to a profound duplicity of life" (103).

The nature of the internal relationship between Jekyll and Hyde has been much discussed. Precisely because "Jekyll and Hyde" has become common parlance for split personality, it is important to remember that, despite a certain disconnection, Jekyll and Hyde are not separate personalities, not even to the degree that Jekyll would like Utterson to believe in his letter of explanation. Vladimir Nabokov, in his introduction to the text (from his Cornell lecture on the novel), notes the importance of not assuming Jekyll is a good man or taking Jekyll at his word that Hyde is simply evil (10-12). To buy into the false distinction between Jekyll and Hyde is to allow Jekyll, and us, the fantasy of a solid barrier against those impulses one might prefer to imagine are not really part of one's self. Instead, Nabokov describes Jekyll and Hyde in liquid terms: mixtures, concentrations, and residues. Jekyll is a moral mixture; Hyde is the concentrate of his evil; a residue of each remains whatever form he is in. The frequency with which Jekyll speaks of Hyde in the first person bolsters this reading. When Jekyll writes to Utterson of being Hyde, he often slips into the first person, including first-person possessive pronouns when discussing his altered body. Jekyll himself says he is "composite" (113).

Another of the dangers of reading Jekyll and Hyde as separate entities is that this obscures a valuable reading of how Hyde represents a release for Jekyll, not as an escape to a different category but as a much more frightening escape from—and thus destabilization of—all categories. Many critics have read Hyde marked as racially different and/or lower class, characterizations that in the parlance of the time are also mixed with evocations of an animal nature. Many have noted that Jekyll describes Hyde as having a “dusky pallor” (112). Several critics, such as Anne Stiles, have called attention to Hyde’s ape-ness in his hairiness (Stiles 37). Paul Fayter suggests the transformation is a “chemically induced devolution” (Fayter 263). In her chapter “Dr. Jekyll’s Closet,” Showalter notes the male-centeredness of the text and terms it one of male hysteria and homosexual panic, arguing that Hyde is Jekyll’s “rough trade,” the passionate working-class boy Jekyll wants both to be and to be with (Showalter 107-11). She suggests that Stevenson might have been inspired by a case of cure by hypnosis in which talking therapy turned a patient who “caressed” men to proper behavior though this carefully applied fraternal affection (105). While the value of these readings is undeniable—and bears considering in the examination of social networks in the text—we should be wary of the way that they may facilitate viewing Hyde as a separate and independent being.

Stephen Arata, in his chapter “The Sedulous Ape,” like Nabokov observes the difficulty of avoiding this trap—this desire—of seeing Jekyll and Hyde as separate people. He notes that F.W.H. Myers, Ridder Haggard, and E.T. Cook all took exception to the fact that Jekyll and Hyde had the same handwriting, in part because this suggested a unity of character they found disturbing (51). Indeed, Jekyll says he had to purposefully alter his handwriting to give Hyde a unique signature to open a bank account in his other name (111). Arata follows a similar train of thought as Showalter, but to a very different conclusion: he argues that Hyde represents not the feared lower class but in fact the terrifying specter of the degenerate gentleman. Arata specifically recalls the physical characteristics that Lombroso identified as those of an atavistic, throwback criminal:—“enormous jaws, high cheek bones, prominent superciliary arches, solitary lines in the palms, extreme size of the orbits, [and] handle-shaped ears” as well as “excessive idleness, love of orgies, and irresponsible craving of evil for its own sake”—and he recalls that both Lombroso and Nordau saw degeneration as endemic to a decadent aristocracy as well as, in Arata’s words, a “troglodytic proletariat” (Arata 34-35).

While the urge to find a specific label for Hyde—a singularly useful lens through which we can view him—goes to the heart of our function as critical readers of literature, there are significant issues with reading Hyde as an ape, perhaps particularly a mimicking ape. Arata makes excellent points, but part of his argument hinges on Hyde’s learning gentlemanly behavior in the course of the story. This reading of Hyde as an “other” in terms combining race, class, and even species is certainly useful in that it brings out these prejudices of the time and shows how they were linked in language and thought. However, while Hyde makes deals with other gentlemen, buys art, and generally acts out the destructive impulses of the bourgeoisie, he does not “learn” any of that. To see Hyde as learning or mimicking is to imply a behavior between Hyde and Jekyll that the text denies. Hyde does not need to learn anything about being a gentleman because Hyde is Jekyll. This reading denies the mixed nature of Jekyll’s character and gives a specificity to Hyde’s nature that the text specifically avoids.

For instance, speaking to himself, Utterson does say Hyde seems “hardly human” and that there is “something troglodytic” about him. Yet in the very next line, Utterson demonstrates one of the issues with seeing Hyde as inhuman when he remembers the “old story of Dr. Fell” (52), referencing a well-known nursery rhyme of the day:

I do not like thee, Doctor Fell,
The reason why I cannot tell;
But this I know, and know full well,
I do not like thee, Doctor Fell.

Indeed, in this very same passage, Utterson says that the otherwise “dusky” Hyde is “pale” (52). So, which is it? Is he dusky or pale? In fact, Stevenson, like many writers of horror, avoids giving too much detail to his monster, an old trick that allows readers to imagine what they fear rather than trying to scare them with what the author presumes is frightening.

In fact, aside from Hyde’s behavior and perhaps his diminutive stature, there is a lack of the sort of terminology Lombroso and contemporaries might use to identify someone as atavistic. While there are some instances of descriptions of Hyde as ape- or monkey-like, they are nearly all about behavior. Concerning physical aspect, Stevenson is mostly vague. To compare, there are four instances of “ape” and “monkey.” First, the murder of Sir Danvers Carew is described as being committed with “ape-like fury” (60). Second, Jekyll describes Hyde’s scrawling

blasphemies in his books in Jekyll's own hand as one of Hyde's "ape-like tricks" (123). Third, at the end of his final letter, Jekyll also describes Hyde as having "ape-like" spite (124). Finally, in the novel's single use of the word "monkey," Poole says, "when that masked thing like a monkey jumped from the chemicals and whipped into the cabinet, it went down my spine like ice," and it is left unclear whether "monkey" is truly a descriptor of Hyde or just of the way he jumped (86).

Examination of another class of word shows us just how invested the novel is in keeping Hyde's nature muddy. Contrast the rarity of atavistic traits with the novel's thirteen uses of some form of the word "describe" or "description" and three uses of "indescribable." There are seven instances of the verb "describe." Generally, these have to do with the impossibility of describing Hyde physically or even the feeling one gets around him. Twice Enfield uses the word to discuss the impossibility of describing Hyde (43). Once the text itself says of Hyde that "the few who could describe him differed widely" (64). Later, Utterson commiserates with the strange feeling Poole describes that he gets around Hyde (68). Lanyon in his letter tells Utterson that Hyde gave him a feeling he can only describe as "a disgustful curiosity" (98). Jekyll says in his letter that he described Hyde to his servants, but he does not say how (109). Only once is the verb used with any level of certainty, when it is said that a maid describes Hyde as "carrying on ... like a madman" (60). The noun "description" is used three times. The first two are when Utterson tells Hyde that he knows Hyde "by description" and when Hyde asks by whose, Utterson suggests Jekyll's, at which point Hyde accuses him of lying (51). The third comes in Jekyll's letter when the doctor, uses the word to refer to the letter itself as a description of events (123). Almost all of these, except the maid's description, which nevertheless expressly refers to madness, and Jekyll's use at the end, which ties all these uses together by referring in a sense to the whole account, demonstrate how descriptions of and reactions to Hyde are difficult to render into words. There are three uses of the term "indescribable," all of which occur when Hyde is being introduced or departing. The first is when Utterson experiences "indescribable amazement" at learning that he has replaced Hyde in Jekyll's will (92). The other two are Jekyll's, when he feels "something strange in my sensations, something indescribably new" at first becoming Hyde (106) and then later feels those same "indescribable sensations that heralded the change" at the second involuntary transformation into Hyde (121). This last is when Jekyll begins to see that Hyde has become his default state.

All these failures of description result from Hyde being not merely evil, but chaos, social chaos. Hyde's appearance demonstrates how desperately Jekyll wishes to leave his aloof laboratory for the street, but he is still not interested in study but only in experience, and in the worst, most destabilizing way. He is a twisted version of Baudelaire's answer to the observer effect, the flâneur. He is the loiterer gone mad, who runs over other pedestrians and stomps on them. In fact, he does so in a way that is not just evil but chaotic. The horror of Hyde comes in the way he completely violates the morality of the gentleman. His two noteworthy victims are the young girl and Carew. The girl, the very sort of person it is his obligation to protect, he tramples and leaves crying in the street. Later he murders Sir Danvers Carew, not merely a good man but the novel's impossibly perfect image of gentlemanliness—an "aged beautiful gentleman with white hair" with "an innocent and old-world kindness of disposition, yet with something high too, as of a well-founded self-content" (60).

In his description of his concoction, Jekyll lays bare his scientific irresponsibility, the amorality to match the monomania of his experimentation, the chaos that became Hyde:

The drug had no discriminating action; it was neither diabolical nor divine; it but shook the doors of the prisonhouse of my disposition; and like the captives of Philippi, that which stood within ran forth. At that time my virtue slumbered; my evil, kept awake by ambition, was alert and swift to seize the occasion. (108-109)

In other words, Jekyll has no idea if the potion would free him of his unseemly desires or of his conscience. If Jekyll were truly interested in making a contribution to science, one that might prove useful to his society, he would never have undertaken such a risk alone, a risk to himself and anyone near him. Jekyll does not bring forth Hyde because he happens to experiment late one night at coincidentally the same time when his "virtue slumbered" (109). His experimentation is itself in violation of gentlemanly virtue; it necessarily puts the whole city at risk.

The social nature of this violation is critical because it signifies that Jekyll's folly is not asking questions the answers to which man was not meant to know. The folly was not even in drinking the concoction. Jekyll's folly, the thing that brought out Hyde, was that he was working alone. There was no point at which Jekyll could have experimented alone and *not* brought forth Hyde because performing the experiment alone is itself a perversion of science and a grossly callous act demonstrating the carelessly chaotic selfishness that is the heart of Hyde. He did

science badly and so concentrated that sense of chaos and entitlement. Of course, this conclusion leads to another question: who could have been there with him?

Hastie Lanyon, the Doctor Left Behind

Dr. Hastie Lanyon is the scientific companion Jekyll once had. Lanyon is Jekyll's social and scientific opposite. While Jekyll is solitary, Lanyon lives in a crowd. Jekyll is a philosophical scientist interested in the transcendental, and Lanyon is a professional medical doctor interested in patients. And whereas Jekyll, for a time at least, is revitalized by his encounter with revolutionary truth, Lanyon is mortally wounded by it. In the end, while he is a far more responsible scientist and far more beneficial to his community, the scientifically and socially rigid Lanyon fails at what might have been the greatest contribution he could have made, reining in Henry Jekyll. Lanyon appears only twice in the normal course of the narrative before we get his letter. As with the letter, Lanyon makes his entry through Utterson. Both times Utterson calls upon Lanyon to discuss Jekyll, hoping for answers, and both times Lanyon is unable to provide them. The lawyer hopes that the doctor will have a better understanding of how Jekyll fares and what his relationship is to Hyde. "If anyone knows, it will be Lanyon," Utterson tells himself on his way to see "the great Dr. Lanyon" the first time (46).

The contrasts begin with the physical. One is reserved and the other enthusiastically gregarious. Later at the dinner we see Jekyll as gentle but hardly demonstrative. He is a "large, well-made, smooth-faced man of fifty, with something of a stylish cast perhaps, but every mark of capacity and kindness" (56). As men do, Jekyll sits in Utterson's unobtrusive company. Stevenson's description of Lanyon is quite a mirror. He is a "hearty, healthy, dapper, red-faced gentleman, with a shock of hair prematurely white, and a boisterous and decided manner" who springs up to shake Utterson's hand. The opposite of Jekyll's aloofness, Lanyon's geniality is "somewhat theatrical" though "reposed on genuine feeling" (46). More than in his personal physicality, Lanyon's medical physicality is the polar opposite of Jekyll's. Jekyll's distant lab on the edge of respectable London is starkly contrasted by Lanyon's. Lanyon works in Cavendish Square, which Stevenson reminds us is a "citadel of medicine" (46). We are told that this is where Lanyon "had his house and received his crowding patients," unifying Lanyon's personal space with his thriving practice.

Utterson comes to Lanyon because he believes the one doctor can provide insight into the other because they have “a bond of common interest,” but Lanyon is a man of practice, of professional and normal science (47). Though he has kept some track of Jekyll, Lanyon has given up on their friendship. Utterson leaves soon after Lanyon explains to him that he has had little to no relationship with Jekyll for over a decade since the other man “began to go wrong” with “such unscientific balderdash” as “would have estranged Damon and Pythias” (47).¹⁸

“They have only differed on some point of science,” he thought; and being a man of no scientific passions (except in the matter of conveyancing), he even added: “It is nothing worse than that!” (47)

Utterson fails to mark the significance of the reference, but Stevenson is keen to highlight it, to show us both how important is this divide and how particular it is to scientists. Stevenson could liken their scientific differences to those of any profession. Lawyers have their disputes over the nature of law. But the text suggests that this is a more profound matter. One is old guard, the other a revolutionary. Also, one treats patients, and the other experiments on and for himself. Jekyll has little more to say on the matter when he briefly brings up Lanyon after their dinner, recalling his distress “at what he called my scientific heresies” (57). To Jekyll, Lanyon is an “excellent fellow” but “ignorant” and, in Stevenson’s clearest joke, a “hide-bound pedant” (57).

We next hear of Lanyon reunited to some degree with Jekyll at another dinner and failed symposium during the two months following the death of Sir Danvers, when Jekyll is on his best behavior. And then we see Lanyon again, through Utterson’s eyes, after the former’s confrontation with Hyde. At the time, Utterson only knows that Lanyon has had some sort of shock, one so acute as to be mortal. It is only when he reads Lanyon’s letter that the reader understands that Lanyon has not been merely startled or frightened, but that he has been confronted with a truth which his understanding of the world cannot encompass.

For Badiou, the markers of a brush with real truth are that it interrupts and disrupts and cannot be truly understood. Truth is too big to hold; it can only be touched. Truth presents the experiencer with a flash of reality that, while it cannot be fully grasped in retrospect, demands

¹⁸ Damon and Pythias (or Phintias) are figures of Greek history and legend, a pair of Pythagoreans who served as exemplars of friendship. When Pythias was sentenced to be executed for political crimes by Dionysus, the tyrant of Syracuse, Damon volunteered to serve as a hostage so that Pythias could have some time to put his affairs in order. When Pythias returned in time to save his friend, the king was so touched that he set both men free. He then entreats the men to consider him a third partner in their friendship, but this last they decline. Kitty Ferguson relates this story in her *Pythagoras: His Lives and the Legacy of a Rational Universe* (2011), using mostly Iamblichus. (There are other, later, versions where Pythias is even attacked by pirates on his way back to Syracuse.)

fidelity, forces itself to be thought of and acted upon. Stevenson writes Jekyll's potion as a catalyst for just such events. Hyde is chaotic, disrupting the lives of everyone he comes across, and he remains an enigma for all his indelibility, impossible to remember with accuracy or forget despite all effort. Even Jekyll does not truly understand how his potion works, only how it has worked on himself. He tells Utterson:

I thus drew steadily nearer to that truth, by whose partial discovery I have been doomed to such a dreadful shipwreck: that man is not truly one, but truly two. I say two, because the state of my own knowledge does not pass beyond that point. Others will follow, others will outstrip me on the same lines; and I hazard the guess that man will be ultimately known for a mere polity of multifarious, incongruous and independent denizens. (104)

For Jekyll, fidelity to this truth is a physical demand, so much so that his body begins to reenact the transformation itself even when the potion is not present.

Hyde, with the full knowledge of Jekyll, is well aware that Lanyon is a creature of normal science, not a revolutionary, that he has no desire for a truth that punctuates equilibrium or disrupts understanding. Yet, as Cohen notes, "Lanyon's explicit positioning as a doctor indicates that he (like Jekyll) is ideally interpellated by Hyde's taunt, since it collapses the play between (un)belief and science that characterized the practice of medicine throughout the nineteenth century" (190). Lanyon is still a scientist, driven to learn, and at a time when scientific knowledge was not only rapidly expanding but revising. And so, the evil Hyde taunts his colleague. As Tabitha Sparks says, Jekyll "confronts the deficiency of rational science" (Sparks 124). But the confrontation is too much for Lanyon, for whom the refusal of the truth bears equally physical consequences as Jekyll's acceptance of it. In the last paragraph of his letter to Utterson, he writes:

I saw what I saw, I heard what I heard, and my soul sickened at it; and yet now when that sight has faded from my eyes, I ask myself if I believe it, and I cannot answer. My life is shaken to its roots; sleep has left me; the deadliest terror sits by me at all hours of the day and night; and I feel that my days are numbered, and that I must die; and yet I shall die incredulous. (102)

Lanyon unites his death with not merely his shock but his inability to believe, to incorporate some form of this truth into his worldview.

It is also possible to frame Lanyon as a casualty of friendship. If not for his willingness to respond to Jekyll's desperate letter, he would never have seen Hyde, let alone the transformation. Yet the text begs us to ask, if the two had never been separated, would Jekyll's potion have been

made, or would it have had the effect it had? Ultimately, Lanyon is a casualty of his own rigidity. Just as Jekyll's scientific selfishness is of a piece with his lack of intimate social engagement, so Lanyon's scientific conservatism is disastrously matched with his social inflexibility. In that second respect, his opposite is not Jekyll but Utterson.

Utterson: The Utter Gentleman, the Flexible Flâneur, and Mr. Trumpet

If Lanyon stands in for the scientific community and demonstrates Jekyll's break with normal science, Utterson strives to be a representation of gentlemanly society. Indeed, after Hyde, Utterson—utter son—may have the most suggestive nomenclature. Jekyll's very relationship with him demonstrates the tenuousness of the doctor's social connections. Aside from being the nonscientific member of their trio, Utterson is in another way the obverse of Lanyon; while he is more reserved in demeanor, he is far more flexible as a friend. It is by virtue of this flexibility that Utterson first signals, if any were willing to hear, that Jekyll is in danger, and it is by this flexibility that he is available to stop Hyde from doing worse than he does. However, Utterson's friendship is of limited use in restraining Jekyll's foray into mad science, not so much because of Utterson's lack of scientific knowledge but because his tolerant nature stems from a lack of personal and moral engagement.

Jekyll, we are told, is the very picture of a respectable man, but Utterson is the first picture of a respectable man presented to the reader, and it is through him that Stevenson first points out something conflicting, even broken, inside the Victorian gentleman. In the first few lines, we learn that Utterson never smiles, that he is "cold, scanty and embarrassed in discourse; backward in sentiment; lean, long, dusty, dreary and yet somehow lovable" (37). He is kindly but aloof. Utterson is also "undemonstrative at the best," and, like Jekyll in keeping with "the mark of a modest man," kept for his circle of friends those granted to him by birth or with whom he had had the longest associations (38). As a lawyer, counting among his clients both Jekyll and Sir Danvers Carew, Utterson not only keeps to social norms but takes part in their enforcement. Showalter calls him a "spokesman for the Law of the Father and the social order" and notes that he approves of Enfield's rule to keep away from streets that look "queer," to be less inclined to learn about them the queerer they look (Showalter 109-11). Utterson's job is to serve and reify the gentlemanly class. He is literally a *professional* gentleman. Gentlemanning is his business. He is also at odds with himself.

Utterson's only real enjoyment seems to be vicarious. He keeps himself and his feelings of enjoyment on an even tighter leash than Jekyll keeps his. In that same first description, we are told that Utterson enjoys the theatre but has not attended in twenty years, and that, though he enjoys wine, he drinks gin when alone "to mortify his taste for vintages" (37). Showalter and many others, including Lisa Butler, accept this as a form of austerity (or at least attempted austerity; Butler notes that Utterson is still a judge of good wine), but Hyman calls into question Utterson's supposed use of gin as a gustatory hair shirt (Hyman 171-74). Hyman points out that this is highly ungentlemanly. Gin was a low-class drink, and while a gentleman might sometimes drink gin, "they did so to flout society's conventions"—it was an act of "slumming" (Hyman 172). Gin and rum were the prime targets of the temperance movement, and gin palaces were on par with opium dens and spoken of the way crack houses or meth labs might be discussed today. Even in the novel itself, the only appearance of a place that sells gin is on the same disreputable Soho street as Hyde's home, a "dingy street" with

a gin palace, a low French eating house, a shop for the retail of penny numbers and twopenny salads, many ragged children huddled in the doorways, and many women of many different nationalities passing out, key in hand, to have a morning glass. (62)

Truly, these are "blackguardly surroundings" (62).

Hyman asserts that gin allows Utterson to lower himself and thus give himself room for improvement, that he continually mortifies not just his taste but his sense of self so that he can re-climb the same few steps of self-improvement every week (Hyman 179). I think it is just as likely that gin, and the quick drunkenness it brings, is Utterson's way of dealing with the joyless life he has made for himself, but either way it would seem to be a chemical dependency not unlike Jekyll's need for his own concoction. Utterson's gin is a fitting parallel to Jekyll's potion. They are both scientific distillations, the modern products of carefully controlled chemical reactions, and both raise up walls within the self. In so many ways, they are the opposites of wine, an ancient drink resulting from a natural fermentation. Gin, like Jekyll's potion, throws up walls. Jekyll's potion walls off his morality. Gin also has a detaching effect. Whereas wine, the drink of the Eucharist and the Symposium, has the power to bring "something eminently human" to Utterson's eye, gin is a tool of his mission of detachment (37). It is this detachment that makes it possible for Utterson both to remain Jekyll's friend and to suggest that Jekyll needs better friends.

Despite his approval of Enfield's reluctance to walk down queer streets, Utterson is the novel's most accomplished traveler. He is the only character to visit every physical scene in the narrative, and yet in so few settings is he the instigator of any action. Primarily he is a gatherer of information. He observes, the text's real flâneur. He is also, as Garrett Stewart points out, the text's reader, and he generally attempts to read as he walks, without undue apprehension, preferring to read "dry divinity," presumably to match his gin (Stewart 366). This fits perfectly with the detachment that is such a feature of his first description. He does not hesitate to follow Hyde down the book's queerest street any more than he does to visit Lanyon on Cavendish Square. Utterson's untouchability is quite in line with the sort of man who is "more inclined to help rather than reprove" what the text vaguely calls "misdeeds" (37). But his fearlessness is the result of a purposefully stilted imagination, and his friendship is a signal that all is not well.

Anyone ought to be somewhat wary of a man who counts Utterson as his closest friend. Not for nothing is Utterson named Gabriel, the trumpeting angel of the Annunciation. His very flexibility makes his friendship an alarm, particularly if he is someone's closest friend.

"I incline to Cain's heresy," he used to say quaintly: "I let my brother go to the devil in his own way." In this character, it was frequently his fortune to be the last reputable acquaintance and the last good influence in the lives of downgoing men. And to such as these, so long as they came about his chambers, he never marked a shade of change in his demeanour. (37)

Utterson himself challenges the power and effort behind his own good influence. Utterson is surely referring Cain's refusal to be his brother's keeper to his own indifference regarding his friends' immorality (a strange posture, considering Utterson is in fact his brother's lawyer), but indifference was not Cain's sin, only Cain's obfuscation. Abel was perfectly moral, and Cain did not "let" his brother do anything. He beat him to death. Utterson is effectively equating his lack of reproof with fratricide.

Utterson proves true to this fraternal credo when he theorizes that Hyde must have blackmailed Jekyll over some youthful indiscretion. This steels him to stand by Jekyll. And no wonder; the peccadillos of comrades are Utterson's profession and the source of his excitement. Utterson's amiability, and his ability to remain friends with Jekyll, comes easily to him because while he is involved on a surface level, he has disinvested himself from a deeper connection with his social network. How else is a reader to think of a man who did not know that his two oldest friends have not spoken in a decade? It is this detachment and lack of intimacy despite a

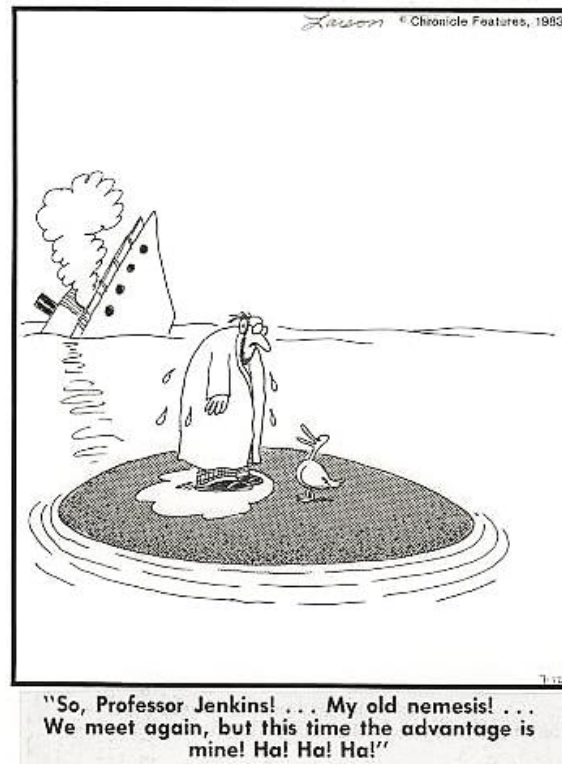
presence of deep affection that render Jekyll's social network useless in preventing his mad science. No one is watching him closely enough to observe his fall. For William Veeder, this failure of intimacy "dramatizes the inherent weakness of late Victorian social organization," and it is the "patriarchy itself" that is under attack in the text (Veeder 107, 109).

And yet Utterson is there, in the end, to force Hyde's hand. It is his presence, his insistence on entry into Jekyll's cabinet, that compels Hyde to kill himself in order to avoid execution. Jekyll believes that Hyde will die without him, but if Utterson had dropped Jekyll, if he had not been there to prompt Hyde's self-destruction, Hyde might have gone anywhere. It seems entirely possible that Hyde would have escaped the city, perhaps even the country, restricted only by his own sloppiness as a criminal. Still, it is not a happy partial success.

What Jekyll needed was to have Utterson philosophizing with him at dinner and Lanyon debating him in the laboratory. Stevenson calls attention to the dangers inherent in the impassivity of polite society and in a rigid scientific discourse. However, the novel also suggests with the specificity of these failings that a collaborative socialization with the scientific genius could create something better than Utterson's trumpet, a system that could harness the destructive potential of the dangerous scientist and prevent mad science. On the other hand, there is a warning here, a threat of what might happen if the network fails even more completely than it did with Jekyll.

In the next chapter, I want to consider a case of complete system failure. H. G. Wells' *The Island of Dr. Moreau* (1896) shows us what happens when a social system not only fails to harness the destructive potential of the dangerous scientist but also unleashes it via social ostracism. Jekyll may have been left alone, but, as we will see, Moreau is hounded out.

CHAPTER THREE—NO SCIENTIST IS AN ISLAND: DR. MOREAU



As we saw in the previous chapter, the importance of a social network was clearly paramount in *Jekyll & Hyde*. As we also saw, that network spanned and to some extent attempted to police what I have been calling the “spectrum” of hazardous science. Dr. Henry Jekyll displayed enough brilliance, abnormality, monomania, and to some degree the amorality, to place him at the mad end of the hazardous scientist spectrum—and met his own end in a final, desperate act of self and narrative regulation. In this chapter, I turn to a story of science beyond all regulation: H. G. Wells’ *The Island of Dr. Moreau* (1896). Dr. Moreau recalls Wilkie Collins’ Dr. Nathan Benjulia, but he is a scientist even more starkly distanced from his society than either Benjulia or Jekyll.

Indeed, there is no figure in fiction more clearly a mad scientist than Moreau, and perhaps no example of a mad scientist who is more dangerous. Even more than Jekyll or Benjulia, he is clearly brilliant, abnormal, monomaniacal, and especially amoral. Unlike either of our previous cases, Moreau displays no regret for his dangerous experiments. Moreau does not even seem to have the capacity for regret, and he denigrates the very notion of sympathy for the

pain of other living creatures. He is also especially isolated, and this isolation plays a significant role in not just the extent, but even the direction, of Moreau's experiments. This isolation, this lack of institutional connections and the poor nature of Moreau's social connections, is a crucial ingredient in the production and continued existence of an entirely unmonitored threat waiting and perhaps growing out there on some unknown island. In this chapter, I will show how Moreau fits into our schema as well as how Moreau's story is a cautionary tale for Victorian and contemporary audiences watching scientists, activists, and politicians fight at the intersection of science and ethics, a demonstration that reaching an understanding is a critical human concern. No scientist should be an island—but many, particularly in the Victorian days before the developments of regulatory institutions like internal review boards, aspired to be.

Science Island

As a way forward, let me offer a synopsis of Wells's novella that highlights the primary moral and scientific concerns that figure in our inquiry and operates as frame for the argument I will pursue about scientific regulation. *The Island of Dr. Moreau* is told in first person by Edward Prendick, who we later learn was traveling as an amateur naturalist aboard a ship called the *Lady Vain*. The story begins with Prendick shipwrecked off the coast of Peru in a dinghy with two other men, another passenger and a sailor. They are nearly bereft of supplies and, though it is repellent to Prendick, they agree to cast lots for cannibalism after six days of starvation. The sailor, a "short sturdy man with a stammer" is chosen but fights with Helmar, the other passenger, and the two of them go overboard. Prendick is left alone to die. This brief opening narrative prefigures the conflicts of the principle story. One character, setting himself up as practically minded and intellectual, struggles to exploit even to death another character who is in some way lesser, less sophisticated and refined. This offends the moral sensibilities of our protagonist and stand-in, but he expresses empathy for no one, does nothing, feels only relief at not having to face harsh choices, and is left worse off than before, his continued existence left to chance. The opening on the lifeboat foreshadows what I argue is the lesson of the narrative: the ethical as well as physical perils of science are magnified by intellectual isolation, and the story calls for regulatory networking and an active audience. It is a combination of unreserved rejection and reserved observation that brings about tragedy.

Prendick is found by a small ship and rescued by a passenger, a medical man named Montgomery, who is taking some animal cargo to a barely known island. Montgomery nurses Prendick some of the way back to health, and when they arrive at the island, he is put off the ship, along with his cargo and Prendick. Montgomery's employer on the island, a white-haired man named Moreau, is interested in Prendick's knowledge of biology but vague about his work on the island. However, Prendick later recalls Moreau's name and how the doctor was "howled out of the country" a decade ago for his research. Prendick discovers that Moreau is experimenting on animals and locates a village of bestial inhabitants that worship a deity who, it is clear to the audience if not explicitly so to Prendick, must be Moreau. Prendick believes that Moreau is transforming human beings into animal-people.

It is at this point, halfway through the novella, that Moreau explains himself and his work. Moreau tells Prendick that he is vivisecting animals to transform them into humans, or as near to human as he can manage. He claims to have made many discoveries about the nature of human physiology, and his work clearly has implications for every science that includes the study of humans, from neurology to history and even theology. Moreau says that, despite his progress, the perfect transformation continues to elude him, and the animals inevitably begin to backslide from their imposed humanity after surgery. Moreau claims that after being vivisected, his creations recall nothing of their former lives as animals nor much of the surgery itself, though something of a fearful memory of the lab, "The House of Pain," remains.

Prendick comes to develop an antipathy for Moreau, his work, the beast people, and even Montgomery, whom Prendick finds suspect for the other man's empathy for the beast people. When Moreau and Montgomery are both killed by Moreau's creations, Prendick attempts to convince the beast men that Moreau has ascended to an all-powerful godhood. The beast people slowly return to animals. Prendick kills to survive. He is eventually rescued by a passing ship. Prendick quickly learns to feign amnesia for the year since the *Lady Vain*, rather than be thought mad for his account of Moreau's island. His return to civilization is uneasy. Humans remind him of the beast people. He benefits from some help from confiding in a "mental specialist" who knew Moreau and somewhat believes his story, but he ultimately retreats to the countryside and devotes himself to chemistry and astronomy.

Aside from the disturbing nature of Moreau's work and the heartrending state into which he has placed the beings he exploits in his experiments, the most striking feature of the novella is

Prendick's near complete lack of input, agency, utility, or even empathy. Montgomery, the only other born-human on the island, is likewise without any positive effect. As horrified as we are meant to be by Moreau, our other principle characters; Prendick, our stand-in as readers, and Montgomery, our other representative of British society, are both utterly ineffectual. Utterson and even Lanyon from *The Strange Case of Dr. Jekyll and Mr. Hyde* did more, and even Enfield would have at least clucked his tongue and turned up his noses at what Montgomery accepts. However, before we get to Prendick and Montgomery and the failure of society on the island, we must recognize that the first and most devastating failure occurs on an island far different from—and yet in too many ways very like—Moreau's: Victorian Britain. Moreau's first break with society, scientific networks, and all hope of regulation happens in London. Through these social and networking failures, we see how *not* to handle hazardous scientists, and we begin to see the potentially disastrous consequences for failing to do so.

The *Other* Island of Dr. Moreau

Before we venture deeper into Moreau's island, we ought to consider his first island, the one he was “howled out” of—England—and some background to the vivisection debate. This requires us to look back nearly a century before the novella. It took what may seem a surprisingly long time to turn ethical and moral concerns over animal experimentation into any sort of formal regulation. Britain set what is commonly seen as the first modern animal welfare legislation in 1822, the Cruel Treatment of Cattle Act or Martin's Act, after Richard Martin, the MP who campaigned for it. However, neither science nor even sport or entertainment, two other long-time issues with animal rights activists, were the focus. Instead Martin's Act outlawed the beating or ill-treatment of many farm animals which fell under the category of cattle, not only bovines but also horses and sheep. Mike Radford (*Animal Welfare Law in Britain*, 2001) notes that Martin attempted later to extend protection to other animals, including dogs and cats, and to outlaw animal fights and baiting, and to address vivisection, but he was unsuccessful (38-40). In fact, Martin's time in Parliament was not long, but he was one of the founders of the SPCA in 1824, which became the RSPCA by royal charter from Queen Victoria in 1840 and which continued to lobby for animal welfare legislation (42). This included the Cruelty to Animals act of 1835, or Pease's Act after another MP, Joseph Pease, which granted some of Martin's desired reforms, such as the extension of protections to more animals and the outlawing of staged animal

fights (44). This itself was replaced by the stronger Prevention of Cruelty to Animals Act of 1849, which, among other things, loosened the restrictions for prosecution and included cruelty in transportation among the offences (62-63).

Then, finally, the 1876 Cruelty to Animals Act addressed animal experimentation and specifically vivisection (Radford 71). All of this is to say that it took over half a century of legislative debate to focus political will on scientific experimentation with animals, and the experiments themselves had been going on far longer than half a century. Descartes famously argued against the very existence of animal pain in *Discourse on Method* in 1637, around which time English physician William Harvey was performing live animal experiments (Guerrini 33-36). French physicians Francois Magendie and Claude Bernard made considerable discoveries through animal experimentation including vivisection in the early nineteenth century, before Martin's Act (Guerrini 70-81). In fact, Martin himself referred to Magendie in his speeches before Parliament and considered him "a disgrace to society," and in 1825 described at least one of his vivisections to his fellow legislators in graphic detail and to moving results (Guerrini 70). Yet it was another 50 years before Parliamentary authority became involved in the legislation of laboratory use of live animals. This was the England from which Wells imagined Moreau being howled out, and the conflict between the antivivisectionists and the scientific and medical communities only grew in severity.

As discussed in Chapter One, antivivisectionists found the 1876 Act and its execution inadequate. On the other side, many scientists and researchers opposed the regulation which they saw as interference from the ignorant. Ferrier was tried for vivisecting without a license, but it was discovered during the trial that the actual surgery had been done by an assistant, Gerald Francis Yeo, who was licensed. License or no, many scientists, intellectuals and physicians opposed stricter regulations on vivisection and backed Ferrier (Stiles 67-68, Otis 33-37). For many, the title of Collins's 1883 novel *Heart and Science* must have distilled the sides quite satisfactorily. It was a matter of compassion for fellow creatures vs the cold acquisition of knowledge. Some intellectuals, such as Arthur Conan Doyle, made humanitarian arguments in favor of live animal research based on the lives that could be saved with that research. Of course, there are always ideological and psychological reasons for scientists or any other group to band together when facing external criticism, but it was also a practical matter. Kuhn's theory of paradigmatic science puts a point on the collective nature of scientific advancement. Science is

essentially a communal activity, and an increase in professionalization and specialization in the late nineteenth century made it more so. Biologists needed chemistry no less in the 1890s than in 1800, but they were less likely to have the specific education and equipment to even check the work of chemists. It was, in other words, a complicated issue, one that touched on complicated web of interests and loyalties.

Laura Otis, in “Howled Out of the Country,” argues that Wells’s 1896 novella was in some ways a follow-up to *Heart and Science*, a more nuanced retrial of Ferrier benefiting from a decade and a half of reflection portraying a more complicated view of the sides and potential outcomes of the vivisection debates. For instance, Otis concludes Wells’s characterization of humanity in general and the “howling” antivivisectionists in particular questions science and the possibilities of the vivisection debate rather than attempting to manipulate readers into falling on one side (47). I agree. Certainly, While Moreau is not a sympathetic portrayal of a scientist (or a portrayal of a sympathetic scientist), none of the characters is particularly laudable, and neither is the view of society as a whole, the British public being likened to beast people. In years between the Ferrier trial and the publication of *Dr. Moreau*, the vivisection debate continued to rage. Activists continued to protest and write, and scientists continued to accrue cultural and institutional power, forming organizations like the AAMR, the Association for the Advancement of Medicine by Research for the purposes of political lobbying. This was the atmosphere at home while we imagine Moreau, 6,500 miles away conducting his experiments.

It’s a Mad, Mad, Mad, Mad Island

It takes very little to observe Moreau’s bona fides as a mad scientist. His brilliance, like Jekyll’s, is observable in his results even if anyone with an elementary twenty-first-century (or possibly a late-nineteenth-century) understanding of biology might deem them impossible to achieve through surgery. However, we can only judge the validity of Moreau’s work based on what is possible in the world Wells created. This is part of why Moreau’s abnormality, from a Kuhnian perspective, is more debatable. While the goals of his experiments are a bit unclear, and his results certainly uncanny, Moreau is probing questions that concerned scientists of the day with the tools that they used. He is also touching on issues that greatly troubled Victorians at the time, not just vivisection but also cerebral localization—though the latter is only alluded to by the behavior of the beast people, and there is no real direct discussion of neurology. Still, there is

nothing about Moreau's interest in anatomy or even the relationship between physiology and behavior that places him outside of the prevailing paradigm. As we have just seen, science is about connections. Moreau is not entirely in step with evolutionary theory of the day, but neither do his concepts seem entirely out of bounds for a late Victorian scientist. His practices were also publicly controversial but far from alien to the science of the day. Even Prendick, like Doyle, is not opposed to the practice of vivisection if those means are justified by the ends of useful knowledge. Moreau's work appears to represent less of a paradigm shift than cutting edge biology. As such, he is more of a stand-in for science itself than Jekyll, who represented a scientist who rebelled against science itself. This is not to say that Moreau is not abnormal. While he may be working under the prevailing scientific paradigm, his behavior is clearly socially unacceptable. This is the heart of the book's criticism of science. Again, Wells is in a sense retrying Dr. David Ferrier and demonstrating how reprehensible a scientist with seemingly normal ideas can be if those ideas are taken to their extremes.¹⁹

From any scientific perspective, Moreau's utility as a researcher is enormously hampered by his isolation. From a specifically Kuhnian perspective, Moreau's relationship to the paradigm is somewhat troubled. Moreau is operating under the reigning paradigm conceptually but outside of it practically because Moreau is in no way connected with any other scientists or their work. Not only is Moreau uninterested in anything Prendick might have to say about scientific advancement since he left England, at no point does Moreau indicate any desire to communicate his findings to any other scientist. The point of a scientific paradigm is to provide a framework for scientists to contribute, the paradigm guides through connection. Scientists produce work that shores up the paradigm and suggests further research.

There is yet another way to view Moreau's place in a paradigm. By placing Moreau on the island, Wells functionally creates a new social and scientific context by which Moreau and his science are to be judged. Moreau has removed himself from the norms and paradigms of the

¹⁹ This take on Moreau, as another retrieval of Ferrier, is not *the* most common stance taken—the three books from the 1980s on Wells's science fiction do not call attention to the Ferrier connection—but it is also not exactly new. Mason Harris discusses Moreau in light of the vivisection debate in “Vivisection, the Culture of Science, and Intellectual Uncertainty in *The Island of Doctor Moreau*,” published in *Gothic Studies*. Laura Otis's chapter in *Neurology and Literature*, edited by Anne Stiles, and Anne Stiles own *Popular Fiction and Brain Science in the Late Nineteenth Century*, make a point of the Ferrier connection, and later critics have followed. Erika Behrische Elce mentions it in “‘Never mind the dog’: Experimental Subjects in H. G. Wells' *The Island of Doctor Moreau* and Wilkie Collins' *Heart and Science*” in *The Wilkie Collins Journal* as does Steven McLean in “‘I Flung Myself into the Futurity’: Wells Studies for the Twenty-First Century” in *Literature Compass*. It also assumed in Ian Conrich and Laura Sedgwick's *Gothic Dissections in Film and Literature: The Body in Parts* (2017).

social and scientific communities of England and London. The readership of the novel becomes the new community which must judge his statements and actions, and we do so primarily through Prendick. Prendick is by no means an antivivisectionist but does believe that scientific cruelty should be justified by some noteworthy scientific ends. This belief forms the basis for a conflict with Moreau that demonstrates his madness from a more Badiouan perspective, as it relates to fidelity to truth, touching the core of not just his abnormality but his monomania and his amorality.

Monomania and amorality are where Moreau and his work truly stand out and are the main features of the fourteenth chapter, “Dr. Moreau Explains.” Chapter fourteen is the thematic, conceptual, and also physical center of the book, placed roughly halfway through the text by wordcount. A note at the book’s conclusion informs the reader that the “substance” of the chapter appeared a few years prior to the publication of the novella in January of 1895 in the *Saturday Review*. The title of that work, not mentioned in the note, was “The Limits of Individual Plasticity.” The critical chapter reads very much as lecture on Moreau’s theories and, more importantly for our concerns, his motivation and philosophy as a scientist. Much more than biology, the lesson is on how Moreau believes amorality is the key to science and how it is certainly key to his own scientific process.

Moreau is on a quest to create a perfect specimen. However, that quest that is almost equaled in importance, perhaps even secondary, to the real focus of his dispute with Prendick, the center of Moreau’s scientific philosophy, the unfeeling nature of his scientific methodology. Moreau’s amorality and lack of empathy are crucial to his work, perhaps even more than the physical results. In fact, his disregard for the suffering of his subjects is one of the truths to which he has become exceptionally faithful. Moreau expresses three surprising and telling sentiments regarding his principal occupation of transforming animals into humans through vivisection. The first is his surprise that no one else was doing this thing. He tells Prendick that he is “puzzled why the things I have done here have not been done before” and “it all lay in the surface of practical anatomy years ago, but no one had the temerity to touch it” (52-53). Even Moreau had originally no interest in this area, probing the limits of plasticity regarding humanity specifically.

The second surprising fact is Moreau’s admission that his choice of the human form as an end-goal for his experiments was entirely arbitrary. While Moreau’s work, if real, could

potentially say volumes about human nature, he does not really care about any of that, and none of it motivated him to begin his work. He says his choice of human was “by chance” and that he “might just as well have worked to form sheep into llamas, and llamas into sheep” (53). The only solid question Moreau is answering is whether or not it is possible to turn one animal into another, a task which Moreau believes he has basically proven possible despite the trickiness of achieving the human form. Moreau’s results so far are, to put it mildly, amazing. However, Moreau does not think of this job as particularly earthshattering, or at least he does not speak as if there are discoveries left to be made in his attempts. Again, he thinks of himself as just connecting dots. He speaks of his work as “collecting butterflies” (55). He has a craftsman-like goal of making a perfect and stable human out of an animal, but he is not really asking a larger question that this accomplishment can answer. And, while he has learned some things, such as that scared herbivores like sheep are “no good for man-making” (56), he does not spend any more time than necessary communicating his work to Prendick, the first stranger he has met in years who cares about science. He bemoans the loss of even an hour of time spent discussing his work (54). So why continue this decades-long attempt at the point when his research question is either sufficiently answered for publication—which he is apparently beyond attempting—or long since slipped away into vacuity? If Moreau were to return to England around the time the novel starts, he would be unable to continue his work, but he could share his findings and probably gain some acclaim for them, and he might even make an impact on the direction of scientific investigation with his contribution. The answer is in the third sentiment Moreau expresses to Prendick in their conversation.

The third, and perhaps most surprising, disclosure is when Moreau calls Prendick a materialist, a title Prendick denies. This is a highly unorthodox use of the word. After all, Moreau’s work, even given the instability of his results, suggests that a vast amount of animal nature, including behavior and level, even the quality of cognition, is a function of form alterable by surgery. That is certainly a materialist’s position. Both the separation of human from animal and that of mind from body would be hard to maintain in the face of Moreau’s work. As previously discussed, the increasingly materialistic stance of science was troublesome to many Victorians. Some of the most fervent public debates on science were centered on materialism and its innate skepticism of anything not observable by physical instruments. In particular,

advancements in cerebral localization, while they did not exactly disprove the soul, certainly went along well with a worldview that discounted the supernatural and immaterial.²⁰

Moreau calls Prendick a materialist not because Prendick disbelieves in the soul or is an atheist, but because Prendick puts a value on physical suffering. The accusation comes when Prendick says “Where is your justification for inflicting all this pain? The only thing that could excuse vivisection to me would be some application—” (54). Moreau insists that Prendick is limited, a materialist, even just “an animal” so long as he cares about pain. And this difference between them is at the heart of why Moreau does not return to England. Certainly, one reason for remaining on the island may be that obsession with success at creating a perfect and stable human, but there is another factor that would make England an unsatisfactory home, and it is not a Kuhnian matter but a Badiouan one.

While Moreau could pass on the knowledge he attained through vivisection, even convince other scientists of his ideas about anatomy, he could not pass on his ideas about science, about how science should be done. In this, Wells’s novella is a more pointed commentary on mad science than Stevenson offered. In *Jekyll & Hyde*, Jekyll’s monomaniacal obsession with his own mixed morality caused him to act amorally, and part of that amorality is in his self-imposed separation. For Moreau, his truth, and thus his monomania, is in his dedication to amorality, or at least what can reasonably be termed an amoral lack of regard for other creatures, and it is this dedication to amorality that has led to his isolation, externally as well as self-imposed. Moreau tells Prendick:

You cannot imagine the strange colourless delight of these intellectual desires. The thing before you is no longer an animal, a fellow-creature, but a problem. Sympathetic pain—all I know of it I remember as a thing I used to suffer from years ago. I wanted—it was the only thing I wanted—to find out the extreme limit of plasticity in a living shape. (56)

And in answer to Prendick’s objection, he clarifies: “The study of Nature makes a man at last as remorseless as Nature” (56). In being “howled out” of England, Moreau was shown that England was, or at least was becoming, hostile to his truth, his belief that science should be remorseless and amoral, that pain and suffering in the performance of science is inconsequential. Given the

²⁰ At the same time, there were some violations of the mind/body divide that did not seem to trouble Victorians. Phrenology, for instance, found considerable popular favor. But then, phrenologists were not generally proposing that a few well-placed knocks on the noggin could make an average resident of Newgate fit for Parliament. Rather, phrenology bolstered the notion that the criminal and the “moral” classes were biologically distinct.

disturbing nature of the results of Moreau's work, there might be no land in which he could maintain fidelity to his truth, let alone proselytize for it. Only on the island, with Montgomery and whatever other flotsam might come his way, could Moreau practice his truth and perhaps convince any others of its validity. This would also explain why Moreau does not bother trying to expound on much of what he has learned in his experiments. It is less important to him that Prendick understand his theories about the plasticity of animal forms, and certainly not whatever he may have learned about the nature of humanity, than it is to pass on his truth about how science should be conducted. Despite his apparent devotion to the practice of this truth, Prendick is proof that Moreau is a failure from a Badiouan perspective. Part of fidelity to truth is in passing on that truth, and Moreau has done very little of that in over a decade. Even in this chapter in which he has such a rare chance to speak to another scientifically minded person, he seems quite ready to give up convincing Prendick of what he sees as the necessary and inevitable emergence of monstrosity in the performance of scientific study.

Outside of the novella, England was struggling much more actively with this potential for monstrosity, and Moreau expands our previous view of the failures of Victorian social networking to do just that. As discussed, scientists and social institutions were connected through a web of intertwining aristocratic, academic, and political interests and alliances, and this included social networks to which many scientists belonged. In *Jekyll & Hyde*, Stevenson demonstrates some of the flaws in this network. It was outdated and unsuited to the needs of scientists in the new era of professionalism, whether they were looking to their laboratories for a paycheck or as a place to fulfill a calling. In addition, this network existed as part of the social reinforcement of proper Victorian masculinity and so was inadequate in its emotional availability and intelligence. These conditions were insufficient for needs of late Victorian science and late Victorian scientists, and thus also for late Victorians. The old schema was unable to provide support for or surveillance on potentially dangerous science. Where Stevenson focuses on the inadequacies of this informal social network, Wells's novella points towards more institutional inadequacies. Legally and institutionally, late Victorian science was not prepared for Dr. Moreau. Wells was prescient in painting the vivisection debate as increasingly impossible. Less than ten years after *Moreau* was published came the next big event in the vivisection controversy, one that would erupt into street violence, the Brown Dog Affair.

Howl Now, Brown Dog

A seminal work on the incident, *The Brown Dog Affair* (1997) by Peter Mason is subtitled *The Story of a Monument that Divided a Nation*. As Mason details, in 1903 Dr. William Bayliss of University College London won a libel suit against the National Anti-Vivisection Society over allegations that his vivisection of a dog in front of medical students had been illegal. In response, a few years later antivivisectionists commissioned a large bronze statue of the dog in Battersea Park. The next year medical students protested the statue and some damage was done to the statue. In a few days, riots broke out with the medical students fighting with suffragettes, trade unionists, and other social activists as well as locals. In *The Old Brown Dog* (1987), Coral Lansbury discusses how the disparate groups had come to see the Brown Dog as a symbol of suffering caused by powerful institutions. Each side saw the other as a power block standing in the way of progress, and each was intractable.

Unfortunately, it would take another several decades to work out considerable progress in legal and institutional scientific oversight. As Robert K. Merton's work points out,²¹ the increasing importance of scientific research in the early twentieth century lead to scientists wanting more insulation from external concerns while simultaneously intensifying anxiety over the power of science and scientific organizations. It took the horrors of World War II, specifically its aftermath, to demonstrate the necessity for common, transparent, and rigorous codes of conduct even in experimentation with human subjects. It was not until the latter half of the twentieth century that the REC (Research Ethics Committee) or, in the United States, IRB (Institutional Review Board) was developed. It would be too far, and impossibly anachronistic, to argue that an REC or IRB would have prevented either Moreau's experiments or expulsion, but it is precisely the sort of development that might have helped the conditions that contributed to both. An institutional ethics committee might well have steered Moreau's research to his aforementioned llamas and sheep, and activists who felt that Moreau was subject to review by a committee of scientists and ethicists might be less inclined to howl. Of course, institutional inadequacies are just one of Moreau's problems.

²¹ See Robert K. Merton's *The Sociology of Science: Theoretical and Empirical Investigations* (1973).

Like Lanyon and Utterson but Worse

Moreau's slip into mad science may have been facilitated by institutional and larger-scale societal shortcomings, but that is not where the problems ended. The interpersonal relationships in the novel are also unhelpful, another opportunity for checks and balances that goes by unseized. Like Jekyll, Moreau has two noteworthy and failed relationships with other characters, Montgomery and Prendick. Unfortunately for all concerned, neither is able to provide any check, guidance, or even counsel to Moreau. Neither exerts much will of their own. The second chapter, in which Prendick and Montgomery meet, is titled "The Man Who Was Going Nowhere." In it, Montgomery proclaims that life is brought about by chance, though later we learn that Montgomery's circumstances, and perhaps himself, are as shaped by Moreau as much as any creature on the island.

Unlike Lanyon, the "other scientist" in *Jekyll and Hyde* who would not do anything but argue, Montgomery is the other scientist who will not argue at all. Or at least he has not for some time. "Montgomery was just the same," says Moreau when he walks into Prendick's room for their single significant conversation, and then "I got Montgomery over to me—in a way" (52, 57). It is a rare insight in the novella to how Montgomery has changed in his time on the island, and how much he is Moreau's creature. All of the influence seems to go in one direction. Of his recruitment, Montgomery himself says little more than that it was by chance: "Simply because eleven years ago—I lost my head for ten minutes on a foggy night" (41). On the island he takes no joy in Moreau's work. When Moreau says that he is "itching to get to work" on the new animals Montgomery has brought, Montgomery responds with "I daresay you are" in "anything but a cordial tone" (20). This is just after Montgomery had warned Prendick that he has perhaps not been so "saved" as he may feel, "That depends. You'll find this an infernally rum place, I promise you" (19). Rum indeed. Montgomery seems both miserable most of the time and often miserable and drunk. Yet, despite regretting coming to the island and his persistent melancholy there, Montgomery repeatedly fails to take advantage of his annual opportunity to be done with Moreau when he travels to the mainland to pick up the next round of animal subjects. Instead of escaping Moreau's compound to rejoin humanity, Montgomery escapes to the village of the beast people, befriending some of them and sometimes training one as a servant, like M'ling, a mix of bear, dog, and fox.

As much or more than a laboratory assistant, Montgomery functions as an intermediary between Moreau and the beast people. Moreau says that Montgomery “interferes” in the affairs of the village of the beast people (59), and he makes clear that he is well acquainted with their “Law.” He points out some scratches in a tree and notes to Prendick “Not to claw the Bark of Trees; *that* is the Law” and then he scoffs “Much some of them care for it!” (65). He prefers their company to Moreau’s and even Prendick’s. In fact, Montgomery displays more empathy and regard for the beast people than most of the few humans he meets, whom he says he does not like and now seem as odd to him as the beast people first seemed to Prendick. M’ling seems to be the individual on the island, of any species, to whom Montgomery is closest. Yet at times, while drunk, Montgomery curses, beats, and even burns the poor creature with lit fuses (65). Demonstrating his position as overseer, when trouble arises with the beast people, Montgomery steps in to investigate without discussion. One wonders if this is not meant to be his purpose.

In the same speech in which says that he “got Montgomery over” “in a way,” the doctor draws parallels between education and hypnotism (54). Soon after, Montgomery tells Prendick that hypnotism is integral to the social structure of the island, particularly with the humans on top (60-61). Montgomery reveals that the beast people are all hypnotized, that Moreau has implanted ideas in their head that “certain things are impossible”—presumably hurting the humans (61). There is strong implication that the Law and the rest of the religious displays of the beast people are the results of Moreau’s post-hypnotic suggestions, perhaps even the intended results, whatever Moreau says. There is no such strong implication that Moreau has actually hypnotized Montgomery, but there is a suggestion that he has Montgomery in his sway. Certainly, though Moreau pretends to be uninterested in the beast people once they leave his compound and thus unconcerned with their behavior, he is also well acquainted with the Law. When they catch the Leopard Man, Moreau even initiates a call and response with the beast people, saying “Who breaks the Law—” and exhorting the crowd to finish “—goes back to the House of Pain.” They then call Moreau “Master” (70).

Regardless of whether or not Moreau meant to enlist Montgomery as an overseer, regardless of whether Moreau manipulated him into his current position or he just fell into it, Montgomery has become a sort of priest, even inquisitor, in the religion of the beast people that venerates the Moreau as a god. The only things Montgomery does to alter or disrupt the status quo on the island are saving Prendick, whom he assumed would stay on the *Ipecacuanha*, and

bringing the rabbits that tempt the naturally carnivorous beast people to violently break the Law. As far as we know, this is the only thing Montgomery has even done to disrupt the operation of mad science on the island. Montgomery's function on the island is to reinforce the Law so that Moreau can do his work, and Moreau wants nothing else from him. This is not a position from which one could easily function as a counselor to exert restraint, coax the direction of research, or even simply serve as a confidant and reason to occasionally be empathetic. Priests do not tell gods what to do.

Prendick is no better a potential companion than Montgomery. Like Utterson, he lets his brother go to the devil in his own way. He stands up on the island no better than he did on the lifeboat. Even if Moreau gave any sign of interest in conversing to the extent that he might actually be swayed from his course or reconsider his views on empathy and the study of nature, Prendick is not the person to draw this from him. Prendick is as directionless as Montgomery, spineless to boot, and as uninterested in a real conversation as Moreau himself. Like Montgomery, Prendick goes wherever the winds blow him. Even before he meets Montgomery, Prendick shows his character by refusing to draw lots. He also does not seem to speak out against it. He does not take sides. He just is. Prendick is taken in by Moreau after he is, cruelly but tellingly, tossed out of the *Ipecacuanha* (a boat named for a plant used to induce vomiting, hence "ipecac"), but he was flotsam long before he was shipwrecked. On the *Ipecacuanha*, Prendick tells Montgomery that he "had taken to Natural History as a relief from the dulness of my comfortable independence" (4). On the island, Prendick does nothing purposefully to shape events. He is a protagonist without direction, much more audience surrogate than a lead character. He does not form a friendship with Moreau or even attempt a real conversation with him after their singular lengthy discussion. He does not form strong relationships with any of the beast people until there are no humans left. Even recounting the death of the Dog Man who was his protector after Moreau and Montgomery were dead, he exhibits no sadness or sympathy in the moment or in reflection. He does not even get closer to Montgomery while he has the chance. Of Montgomery he says, "His long separation from humanity, his secret vice of drunkenness, his evident sympathy with the Beast People, tainted him to me" (75). Prendick does attempt to build an escape raft, but he proves incapable. As he says, he was out of school before importation of the slöjd tradition would have given him elementary carpentry knowledge. He escapes the island only because by chance an empty boat runs aground. Again, in education as in all else, he is

buffeted and directionless. However, it is not his lack of decisiveness or knowledge that most characterizes Prendick, but rather his refusal to engage.

As in *Jekyll and Hyde*, one of the ways social engagement and its lack are demonstrated is through drink. Montgomery, for all his flaws, gets involved. His involvement with Moreau may be dysfunctional, but he is not withdrawn. He also engages with the beast people, too much for Prendick's taste. Again, his relationship is dysfunctional, even abusive, but he gets involved. Indeed, paradoxically for a man who spent almost all of a decade on a remote island with few inhabitants, Montgomery seems unable to disengage. He has become stuck on the island, despite having more freedom to leave than any other character. Montgomery also drinks. Prendick compares his "passion for drink" for Moreau's "passion for research" (74). Though we do not see him drink with Moreau, Montgomery does eventually drink with the beast people, and on several occasions he attempts to share a drink with Prendick, though this rarely goes well.

Unlike in *Jekyll and Hyde* there is no especially good model here for convivial consumption, not even a single good night. Moreau himself brings Prendick some brandy and biscuits, though he refuses the drink because he has been "an abstainer from my birth" (20). Not long after his arrival on the island, Montgomery tries to discuss alcohol with Prendick. He claims that drink was part of how he saved Prendick's life (25). Later after Prendick faints following his first foray into the island's forest, Montgomery gives him brandy, which Prendick believes he takes a certain satisfaction in doing (34). Finally, after Moreau has died, Prendick wants to formulate plans for leaving the island while Montgomery, who is in a state of shock and grief, bemoans that he is an outcast and worries for the "decent part" of the beast people (82). Montgomery tries again to get commiserate with Prendick over brandy. "Drink!" he demands, calling Prendick a "logic-chopping, chalky-faced saint of an atheist" (83). Prendick offers him no such comfort and suggests no aid in helping him return to England or settle in any other populated place. It is after Prendick rebuffs Montgomery that the latter staggers off to drink with the beast people, proclaiming that drink is the element of humanity they are missing (84). He is dead in a day, and he and Prendick do not speak again. Both Montgomery's abuse and Prendick's teetotalism seem maladaptive and unhelpful to each other, to Moreau, to the beast people, and, ultimately, to society at large.

Prendick continues his lack of engagement upon his return to England. He withdraws from society and even from the study of biology, now preferring chemistry and astronomy.

Recalling Gulliver, he sequesters himself in his home laboratory and library away from crowds and cities. Prendick too has glimpsed a truth, and perhaps that is why he feels the need to set his story down. Regardless, whether from surrounding trauma or his own inherent nature, he otherwise turns his back on what he has encountered and what it might mean about humanity. The only insight he shares is that we are perhaps not so different from beasts, and his only remedy for dealing with this insight is isolation from humanity.

Like Jekyll but Worse, Like London but Worse

For his part, Moreau also fails to reach out, even at the end. He dominates, he lectures, he hypnotizes, he orders, but he does not really converse. He does not negotiate. It is impossible to know for certain from the text if Moreau was always unreachable, if symbiosis was ever truly possible, but there are some tantalizing hints that it may have been. He was not always committed to this particular line of research, and he even says that his remorselessness was learned. There is an implication there that he once may not have been so hardhearted and implacable. Once, a negotiation might have been possible whereby his sentiment might have been engaged with and even nurtured to the benefit of himself and others. A niche might have been found or made, but now rejection has bred rejection. Moreau exhibits no care for anything but his own experience of his work, not even for the dissemination of whatever knowledge he acquires. As a member of the scientific community, Moreau is a failure, and the results are disastrous.

Once, England might have had a researcher testing the limits of the individual plasticity through experimentation on sheep and llamas. Instead, at the novella's end, there is an island somewhere off the west coast of South America with vivisected animal hybrids that can breed. Once there was a chance to work with a brilliant mind and compelling scientific theory, and now there is only an unknown danger somewhere in the world and no way of observing it. If at any point an observing committee could have assisted, every character in the novel seems to work to limit that possibility except through the relation of the story. In the world of the narrative, the story itself, if we suppose that Prendick shares it, is the only hint to the rest of the world that there is a situation that bears attention. As a novella, the book calls upon us to function as an IRB or REC, not just to reflect on the Ferrier case, but to consider future cases. This is one function of science fiction, and particularly the subgenre of mad scientist stories. They create in the audience

a voluntary unofficial committee to consider and discuss the potential for ethical dilemmas that may arise in future scientific research.

The shape and nature of committees is something I wish to return to in the coda of this dissertation, but it will also be a consideration in analyzing the next work. In the next chapter, I want to consider a case very much opposite to Moreau's. Bram Stoker's *Dracula* features a scientist who, despite unconventional interests and an obsessive, even amoral, nature, has a special genius for networking.

CHAPTER FOUR—HAVE CACKLE, WILL TRAVEL: PROF. ABRAHAM VAN HELSING



Professor Abraham Van Helsing may at first glance seem an odd nominee to the society of hazardous scientists. He engages in what we would call pseudoscience, but the barriers between science and what is now pseudoscience were not so thick in the 1890s. He brews no concoctions and in fact has no according-to-Hoyle laboratory. Van Helsing is not an outcast like Moreau or even in the way of Stevenson's Henry Jekyll, who lived a life of isolating quiet desperation but who nevertheless had people who counted themselves his friends and even colleagues. The Professor has certainly not fled or set himself up against society. In fact, Bram Stoker's Dutch polymath seems to put forth a great deal of care for other characters, their society, and humanity in general. In many ways, Stoker's eponymous villain is a more obvious candidate. Though none of his thirst drives him to scientific discovery, Dracula possesses all of the brilliance and the easy sadism of the hazardous scientist—he even has a remote castle complete with a room to study all things English and a prisoner on whom to experiment.

Yet Van Helsing, the foreigner who defends England in Stoker's *Dracula* (1897), is not only a hazardous scientist but also one who has successfully negotiated a social position from

which to live and work. We are not privileged with a glimpse of a younger Abraham Van Helsing struggling to find his place in society or acceptance for his work, which would be an image of youthful experimentation which might make him a more easily identifiable hazardous scientist. Instead, Stoker gives him to us fully developed, a scientist in full and at the height of capabilities. And, indeed, it is the power of his mind that connects him to the hazardous fraternity. When we consider Van Helsing's formidable scientific mind, as he is first described to us, and evaluate him as we have Jekyll, Moreau, and Benjulia, we immediately see the similarities among them. Van Helsing is without a doubt both brilliant and strange. From the Kuhnian perspective, he is dangerous because of his willingness to work on the scientific fringe, and in Badiou's language, Van Helsing clearly demonstrates a fidelity to his truth, one that shows itself in a capability for detachment from moral standards. Though his ends are essentially moral and even stabilizing, Van Helsing pursues them monomaniacally, with coldness, even cruelty evident in his sense of humor. In pursuit of his aims, he uses methods that Wells's Moreau might envy and which would no doubt horrify Stevenson's Dr. Lanyon. It is critical to note that this monomania is no accident of character but integral to the plot, as it is through these qualities that Van Helsing is capable of the insights that lead him to encounter, relay, and deal with potentially destabilizing truths.

Despite his hazardous nature, Van Helsing has found himself a niche in not just one nation but in European society. Moreau eschewed the city, but Van Helsing is cosmopolitan in a way Jekyll—boxed in by his anxiety, self-hate, and eventually by Hyde—never dreamed. He has accomplished his niche by not only by doing good but also by a complex strategy of advertising his utility, performing obedience to social standards, and using academic status and eventually professional credibility as a way into social networks, all of which affords him the clout to further manipulate individuals and groups. Counterintuitively, and in contrast to Dracula, Van Helsing bolsters his apparent harmlessness by simultaneously advertising his foreignness. Both Van Helsing's direct manipulation of networks and his foreignness are integral to the success of his work.

First, Van Helsing skillfully advertises that he is a useful and dutiful friend as well as advisor. He advertises his obedience to religious authority, even as he violates religious rules. These practices convey his harmlessness and his utility, and they assist him in maintaining an invaluable international network of intellect and influence. Van Helsing's skill at networking and

building networks begins here, but this is only a part of his capacity for social maneuvering. The addition of an ability to compartmentalize makes it possible for Van Helsing to influence those around him to achieve his ends, something especially apparent in the how he creates and directs the group of protagonists through emotional manipulation.

Second, in a sort of reverse aposematism, Van Helsing paradoxically marks himself as safe by never letting himself blend in, and he is especially wary of being outright domineering. By constantly reminding those around him of his foreignness, Van Helsing avoids an uncanny valley of familiarity that could mark him as a dangerous other. Likewise, he eschews dominance for collaboration and influence. Thus, Van Helsing's alien nature becomes a supporting pillar for his position of acknowledged, friendly outsider, who promises not to colonize or control—a position that facilitates Van Helsing's direction of the allies needed to defeat Dracula. In each of these ways that Van Helsing marks himself as safe, he stands in stark contrast to Dracula, who is a terrible friend, pays only lip service to authority, and attempts to both blend in and to command. In this chapter I will establish Van Helsing's bona fides as a dangerous scientist and examine the strategies for networking that both allow him to maintain his status as a respected scientist and also separate him from his enemy, the vampire. My claim is that Stoker is able to synthesize both the raw power of fringe science—which, as we have seen in earlier chapters, motors scientific development across the century—and the social networking necessary to contain and direct that power.

The Doctor Is In

Before further considering Van Helsing specifically, we should review briefly the timeline of the novel—which stretches over six months, from early May to early November—and remember his place in it. Van Helsing does not appear in the text at all until the ninth chapter in September, four months into the events of the novel and over a quarter of the way through the book's length. Before Van Helsing's entrance, *Dracula* has two somewhat distinct plots occurring on either side of Mina Murray-then-Harker's life.

Mina's fiancé Jonathan Harker travels to Transylvania to sell English real estate to Dracula in May and is imprisoned by Dracula. Dracula leaves for England in early July. Mina spends much of her time writing and visiting her friend Lucy, who is about to become engaged to one of her three suitors. Dracula arrives in London in early August and soon begins attacking

Lucy in her sleep. In late August, Mina leaves to see Jonathan, who has escaped, and the two are married. The Harkers return around mid-September. Jack Seward, one of Lucy's former suitors, writes to Van Helsing for aid in diagnosing and treating Lucy. He arrives quickly, but cannot save Lucy, who dies on September 20th.

Van Helsing remains, transitioning from medical doctor to Professor of Vampirology for the protagonists. He orchestrates the staking of the now vampiric Lucy, which takes over a week to bring about. During Van Helsing's research into Lucy's final days, he reads Mina's letters, and it is then that he unites the two strains of the narrative by visiting the Harkers. After staking Lucy, Van Helsing focuses the "Crew of Light" (as Christopher Craft calls them in recognition of Lucy's centrality to the formation of the fellowship) on a new task, hunting and killing Dracula. By this they hope to save Mina, who has become Dracula's next victim and is turning into a vampire, as well as Britain. With Van Helsing as chief advisor, the Crew of Light leaves England in early October, in a month-long pursuit of Dracula all the way back to his castle for the final confrontation, and there they end him.

The very plot of the novel and the way it is told, though letters, journals, and news clippings, is a puzzle that must be recovered and knitted together. Van Helsing and Mina assemble the story and learn the pattern as they assemble the community that forms the Crew. Van Helsing's facility for serving as a human social node is invaluable in this, just as it is for hunting Dracula, and as it seems to have been for his entire life. Indeed, he exists almost entirely as a feature of other people's accounts.

Abraham Van Helsing, Hazardous Scientist

Van Helsing's status as a hazardous scientist—his brilliance, interest in abnormal science, potential amorality and monomania, and devotion to truth—is not simply a feature of but also the reason for his introduction. Van Helsing is presented to the text, to the other characters, and to us by Jack Seward, his friend and former student. Seward warns of his mad-scientist-like tendencies and excuses them, enacting in brief the negotiation between society and the friendly dangerous scientist. Seward tells Lucy's fiancé, Arthur, that he has sent for his mentor and says of Van Helsing:

He is a seemingly arbitrary man, but this is because he knows what he is talking about better than anyone else. He is a philosopher and a metaphysician, and one

of the most advanced scientists of his day; and he has, I believe, an absolutely open mind. This, with an iron nerve, a temper of the ice-brook, an indomitable resolution, self-command and toleration exulted from virtues to blessings, and the kindest and truest heart that beats—these form his equipment for the noble work that he is doing for mankind—work both in theory and practice, for his views are as wide as his all-embracing sympathy. (105)

In Seward's preface to *Van Helsing*, we are immediately prepared for Van Helsing to be troubling in both a Kuhnian and Badiouan sense. First, Seward paints Van Helsing as a brilliant mind, interested in everything and beholden to nothing, not the sort of mind restrained by normal science. Second, we are told he is also capable of great focus and impossible to control. What we can trust him to do, in Badiouan terms, is to seek out and be faithful to truth. To this Seward then adds a coldness, the "ice-brook" temper, that we expect in someone who can detach themselves from normal morality when scientific goals require it. Finally, Seward follows this with what are now quite necessary assurances that Van Helsing is non-threatening, that Van Helsing is also possessed of the "truest heart that beats" and that his sympathy is as inclusive as his views. Seward ties Van Helsing's "all-embracing sympathy" to the nobility of his work, but to readers of mad scientist narratives, it suggests a warning against an unpredictability, even instability, that only strengthens a sense of unease with the character.

Van Helsing's employment of blood transfusions, though blood types were not yet known at the time, shows that he is on the cutting edge of science. But he is willing to go further. The suspicion that Van Helsing is hazardous in the Kuhnian sense—that he is comfortable operating beyond the bounds of scientific paradigms—is planted in the letter and confirmed later in the text. Van Helsing is summoned for his medical knowledge, but Seward also notes how the Professor's knowledge stretches into the metaphysical, even the arcane. While Seward hopes this mindset will be useful, we learn that the breadth of Van Helsing's knowledge itself makes the more conventional Seward uneasy for the way it rejects boundaries.

Van Helsing gives clues relatively early that he suspects Lucy's illness is beyond the realms of normal science, perhaps even the work of a vampire. On his second visit to Lucy, Van Helsing says nothing outright to Seward, refusing to share his theory in a rather Holmesian passage in which he likens both his ideas and Seward himself to unripened corn, signaling that he wishes both of them to reach their conclusions unprejudiced by the other's ideas. However, the professor notes the mark on Lucy's throat and runs back to Amsterdam for books and with

which he says they “may begin” a task which he refuses to clarify (115-16). The professor is soon back, and only a few days later the garlic arrives, also an import (120).

It is not until Lucy is lost that Van Helsing confronts Seward with the truth he has encountered through Lucy’s death, that they have found themselves in opposition to a vampire. When he does, he is clearly frustrated by the task of helping Seward move beyond the science with which he is comfortable, asking Seward, “Do you mean to tell me, friend John, that you have no suspicion as to what poor Lucy died of; not after all the hints given, not only by events, but by me?” (170) As I said, what was pseudoscience was not so agreed upon at the time. Victorian science was not so settled in its view of psychic or even plainly supernatural phenomena as science today, yet there was an uneasy relationship between spiritualism and the hardening materialism of science. This unease is apparent in the ensuing conversation. Van Helsing finally gives up subtlety. Before diving into vampires, Van Helsing prods his former pupil by questioning him on contemporary fringe science. Helsing continually hammers Seward with first abstract and then particular questions which he cannot explain from his position under the current scientific paradigm, pushing him beyond it. He says,

Ah, it is the fault of our science that it wants to explain all; and if it explain not, then it says there is nothing to explain. But yet we see around us every day the growth of new beliefs, which think themselves new; and which are yet but the old, which pretend to be young—like the fine ladies at the opera. I suppose now you do not believe in corporeal transference. No? Nor in materialisation. No? Nor in astral bodies. No? Nor in the reading of thought. No? Nor in hypnotism—” (171)

When Seward responds that Charcot has proved hypnosis, Van Helsing questions how he can “accept the hypnotism and reject the thought reading” (171). Van Helsing then goes on to note how contemporary developments in electricity would have been deemed wizardry in the past and catalogues pseudoscientific claims of long lived, immortal, or otherwise death-defying animals—finally getting to vampire bats. Waving away Seward’s exclamation of shock, Van Helsing launches into another lengthy paragraph of concepts that Victorian science would struggle to explain until Seward finally begs him “let me be your pet student again” (172). Van Helsing’s certainty may put one in mind of Moreau, but where the island doctor laid out his case and left, Van Helsing, who is committed to building his team, verbally hammers away until his charge is receptive to his ideas.

Over and above the abnormal interests and willingness to pursue abnormal truths that typify hazardous scientists, Van Helsing demonstrates the hazardous scientist’s ability for

monomaniacal focus and the capacity for detachment and amorality that facilitates such focus. Nowhere is this more evident than in the encounters with the child victims of the vampiric Lucy. When Van Helsing confronts Seward with the proof that Lucy is the mysterious Bloofer Lady preying on children, he says that the two of them could end things right then—and then realizes that “we may have to wait Arthur” (180). He knows he may have use for the friendship and resources of Lord Godalming, but that he will need to convince his rich friend first. And so, having possibly just arrived in time to save the life of her last victim, Van Helsing instead places garlic and crucifixes around Lucy’s grave to starve her into the desperation that will give him the opportunity to prove his case to Arthur and Quincy. Van Helsing is more than willing to prioritize his own plans and goals above the lives of even innocent children.

In his monomania, Van Helsing is often blunt, once flatly asking the grieving Arthur, as of yet ignorant concerning vampires, “May I cut off the head of dead Miss Lucy?” (184). But it is in his sense of humor, particularly the King Laugh speech, that the text best showcases Van Helsing’s oddity and a lackadaisical approach to social norms that at least verges on inhumane. At Lucy’s funeral, Arthur, then unaware that he was not Lucy’s only blood donor, has said that he felt the act made her “truly his bride,” and Van Helsing cannot help but giggle at this because if so, he says, it would make Lucy a polyandrist and he a bigamist (158). Seward is understandably repulsed by Van Helsing’s ability to see humor in the situation (158-59). Whether or not one buys Van Helsing’s argument—that he is greatly empathetic but that his desperation for any humor in the knowledge of their impending difficulties has forced on him a moment of gallows giggles—it is clear from the perspective of the characters and the text as a whole that Van Helsing is an unsettling character and an unsettling sort of scientist. The inappropriate laughter may remind the reader of Van Helsing’s first words in the novel. When the professor meets Seward after arriving in London, he remarks that “all men are mad in some way or the other” (111). Fulfilling the promise of Seward’s preamble, Van Helsing’s first spoken words question the very existence of sanity and imply that his own stability is not to be assumed. Hazardous indeed.

As previously noted, there is a mirror here with Dracula. The count is likened to a scientist by Van Helsing himself, who speaks of the count as an experimenter and says he was schooled in alchemy (263). Van Helsing also muddies the lines (already not so firm in the nineteenth century) between science and the supernatural. Though we do not see him perform

what we would see as science, Dracula exhibits many of the other characteristics of a mad scientist. He is brilliant, abnormal, monomaniacal, and amoral. He is not, however, obsessed with any truth in Badiouan sense. He is an aristocrat and a colonizer, but there is nothing external to himself to which he seems dedicated, and the only progress in which he is interested is his own in the creation of servants and offspring. Also, while Dracula may operate outside admittedly-still-forming scientific paradigms, he is interested in learning to appear to obey the rules rather than in the exceptions that test them. Obsession with unsettling truths is Van Helsing's quality alone.

Van Helsing the Networker

Seward is not the only one aware of the off-putting nature of Van Helsing's dichotomous personality, icy brook with a heart of gold. Despite his apparent social awkwardness, the professor displays an innate understanding that he is an unsettling person and compensates with frequent signals of his trustworthiness and utility through his participation in various social networks. Through this skill at networking, combined with the very detachment this is meant to ameliorate, Van Helsing exerts his influence and directs the protagonists.

In his response to Seward's call, one of the rare times in which we get Van Helsing's words directly from the professor, Van Helsing shows a particular care for friendship and for making clear his devotion to his friends.

When I have received your letter I am already coming to you. By good fortune I can leave just at once, without wrong to any of those who have trusted me. Were fortune other, then it were bad for those who have trusted, for I come to my friend when he call me to aid those he holds dear. Tell your friend that when that time you suck from my wound so swiftly the poison of the gangrene from that knife that our other friend, too nervous, let slip, you did more for him when he wants my aids and you call for them than all his great fortune could do. But it is pleasure added to do for him, your friend; it is to you that I come. (106)

The messages are clear: I am in demand and also your friend is my friend. Van Helsing expects to enlarge his circle of friends through this encounter, and of course his new friend will be quite grateful for that because they will doubtless never have had a friend like him. Van Helsing seems

to be a traveling puzzle-solver, well connected, whose loyalty to medicine and science as well as to his friends makes it easy for them to excuse his eccentricities.²²

Some time later, Van Helsing expounds further on friendship when he meets with Mina Harker to question her concerning her correspondence with Lucy during the latter's illness and perhaps to confirm his suspicions that a vampire is to blame. He tells Mina,

My life is a barren and lonely one, and so full of work that I have not had much time for friendships; but since I have been summoned to here by my friend John Seward I have known so many good people and seen such nobility that I feel more than ever—and it has grown with my advancing years—the loneliness of my life. (165)

This attestation of a life of loneliness seems somewhat paradoxical when one remembers Van Helsing's earlier statement that Seward caught him in a rare moment between obligations. It seems even more so considering how often the professor speaks of friendship and how easily he makes friends. When Van Helsing finally meets the Harkers, he might ask for confidence, but instead he literally asks for Harker's hand—"you will give me your hand, will you not?"—and for them to "be friends for all our lives" (169).

As the novel goes on, the notion that Van Helsing is without friends turns from suspicious to laughably inconsistent with established facts. Even before Van Helsing meets Mina, he appears to be a man who forms attachments readily. Just after meeting Lucy, he tells Seward, "she charm me, and for her, if not for you or disease, I come" (108). And once treatment begins it becomes apparent that Van Helsing has many connections upon whom he can call to aid the group. The very garlic Van Helsing uses in Lucy's room came from his friend Vanderpool,

²² Seward's and Van Helsing's characterizations of the Dutchman put in mind another famous traveling academic. In the field of mathematics, there is a special way to assess the connectivity of professionals. Most published mathematicians have an "Erdős number." Paul Erdős, whose story is touchingly related in a biography by Paul Hoffman titled *The Man Who Loved Only Numbers* (1999), was a strange houseguest. He visited, sometimes unannounced, other mathematicians and expected them to feed him and wash his clothes, and this they did gratefully because, as he would say when he arrived, "my brain is open." Erdős visited mathematicians working on interesting problems and in his 83 years before his death in 1996 he coauthored over 1,400 papers with more than 500 collaborators. Aside from a love of math, Erdős had a loyalty to mathematicians. There is a noted anecdote in the biography concerning his care for a colleague struck with brain cancer whom he visited repeatedly in the hospital. Erdős numbers works like so: Erdős's collaborators are said to have an Erdős number of 1. Anyone who has collaborated with one of his collaborators (but not Erdős himself) has a 2, and so on. According to *The Erdős Number Project* website, the number of mathematicians with Erdős numbers (to say nothing of those in the sciences or even the humanities connected through levels of collaboration) is in the hundreds of thousands, and at last count the median number of those who have one is 5. Consciously or intuitively, in addition to his other intellectual gifts Erdős had a profound understanding of intellectual symbiosis.

who raises it in greenhouses in Haarlem and who sent it to him immediately upon Van Helsing's telegram the day before (121).

Just after meeting Mina, Van Helsing goes with Seward to the North Hospital to observe the body of a child he believes to be one of Lucy's victims, and the two gain access to the body by calling upon a mutual friend (and classmate of Seward), a Dr. Vincent (174). Not only does Van Helsing bring up this possibility—demonstrating the track he keeps of his friends and acquaintances—but Van Helsing correctly predicts that Vincent will permit them access without requiring them to explain or leave written record of their reasoning.

Not long after, when Van Helsing leads the Crew of Light to confront the now vampiric Lucy, he reveals that yet another connection has furnished him with blessed communion wafers (187). There is some critical hay to be made over Van Helsing's explanation that he was granted an "indulgence" to use the Host in this way. Stoker waves away this extremely unorthodox use of Host with an equally unorthodox use of the term "indulgence," generally a pardon for a crime already committed. However, whether Stoker's diction is a result of a looseness of an Irish Protestant's approach to Catholicism or an assumption of the lack of care his audience would have for the precision with which he used Catholic terminology is secondary. The principal effect is that Van Helsing has a very good friend in the clergy, one who is willing to bend the rules for him and even excuse his behavior in advance. Even Van Helsing's knowledge of Dracula's life comes through his international network of friends, specifically from a colleague at Buda-Pesth University by the name of Arminius (212).

Building friendships and embedding himself into networks—networks of friends, networks of colleagues, religious networks—is how Van Helsing vaccinates himself against the personal and professional feedback loop of eccentricity and isolation that is such a feature of the hazardous scientist. And the display of Van Helsing's skill at relationship building and networking is not limited to references of his existing networks or even the formation of new friendships in the text. Van Helsing also serves as a regulator and director of affection, particularly in the way he exercises control over the way the men interact with Lucy, especially Arthur, her fiancé. Moreover, the shrewdness with which Van Helsing regulates Arthur's contact with Lucy is less suggestive of a good friend than of a detached manager of circumstance, carefully manipulating the situation so as to produce the most favorable conditions for his work.

Van Helsing controls the displays of affection between Arthur and Lucy—at first it seems to dole out encouragement to Arthur to do as he says, then to preserve Arthur’s life, and finally to manipulate Arthur into acknowledging the truth of Lucy’s vampirism and bring the entire Crew of Light to commit to the task of killing Dracula. Van Helsing’s role as go-between for Arthur and Lucy begins with the first transfusion of blood. When Van Helsing arrives on his second visit, soon after his first, he determines that Lucy must have blood and fortunately Arthur arrives just in time to serve, pledging somewhat ominously that he would give his “last drop” for her. Van Helsing replies that he does not “ask so much as that—not the last!” (113). He also allows Arthur to kiss Lucy after she has been sedated while he and Seward set up the transfusion equipment, and he allows another kiss for “the brave lover” when the transfusion is complete (114, 115). Just as he supervises the transfusions, Van Helsing supervises the affection between Lucy and Arthur until the former has died. As Lucy is dying, she has a vampiric moment wherein she seductively beckons Arthur to her for a kiss. Van Helsing stands between them until she calms and then allows her lover a single chaste kiss on the forehead before her death (146-47). Kisses, like the blood, are doses of manly strength and love which are only administered at Van Helsing’s prescription. And the management of their application does not end in death.

As we have seen, Van Helsing is not above using even more dramatic moments to bind others in the Crew to him, most notably Arthur. He begins recruiting Arthur with a care that grossly contradicts his supposed social awkwardness. At dinner soon after Lucy’s death, Van Helsing knows he must ply Arthur for permission to read her papers (153). Van Helsing seems already planning some sort of postmortem ritual, but he needs Arthur’s permission to dig through her possessions. He begins by addressing him as Lord, socially appropriate since Arthur’s father has died and the title has now passed to him, but when it agitates Arthur because it reminds him of his recent loss, Van Helsing quickly switches tactics and tells him that he only said “Lord” because he felt “Mr.” inappropriate for one that he has “grown to love” by his first name, addressing him as “my dear boy” as well as Arthur (153). They clasp hands, and Van Helsing tells him he hopes he “may always have the title of a friend,” but understands that Arthur does not yet trust him. He is right. He gets Arthur’s permission (153-55). It will take special arrangement to prompt Arthur to call him friend.

As discussed, Van Helsing admits to Seward that he has carefully arranged for Arthur to encounter the vampiric Lucy while she is hunting. The professor is not merely putting children at

risk of death and vampirism. He is building a trauma and catharsis for Arthur and, though them, a trust for and dependency on himself. When Lucy advances on her once fiancé, Van Helsing resumes his place between them, this time with his crucifix (188). Then, after Arthur finally accepts the truth of Lucy's vampirism, Van Helsing immediately calls him "oh my friend," prompting Arthur to use the word in return (189). Van Helsing seizes upon a moment of extreme emotional crisis for Arthur and stamps their friendship on it. He walks Arthur through dispatching his fiancée in a scene likened by some to one of group sex and one which the language makes disturbingly reminiscent of a father taking his son to a brothel to become a man. He calls him "brave lad" and tells him "a moment's courage, and it is done," to which Arthur responds, "tell me what I am to do" (191). Once Lucy is finally dead, Van Helsing, now with his more usual bluntness allows Arthur to "kiss her dead lips" (193). As Van Helsing forged their bond in the heat of Arthur's horror and adrenaline, he sets it in the coolness of the younger man's relief.

This is how Van Helsing has answered de Certeau's dilemma of the urban scientist. He is on the street, actively engaged in observation and experimentation, and yet he is above it. Van Helsing's aloofness is not a physical separation or even a purely mental one, but he maintains distance. By always advertising that he is an outsider, Van Helsing keeps a distance that provides an opportunity for clarity and a bird's eye perspective on the map of events. This is something for which foreignness, as well as general strangeness, would be very useful.

The Accented Hero

Very much tied to his ability to maneuver in, influence, and even create networks is Van Helsing's foreignness. Van Helsing is a reverse aposematist, marking himself safe through his foreignness as he shuns supremacy for the role of influential comrade. The role Van Helsing has made for himself, obvious and friendly outsider, is best first seen in stark contrast to Dracula, the insidious foreign contagion. Dracula arrives at a perilous time for the British Empire. As Diane Simmons notes, by the last decades of the nineteenth century, Britain was no longer the undisputed capital of industry. Instead, Britain was maintaining its imperial primacy through trade, a hub rather than a source of goods. Contemporaneous with, and not unrelated to, this shift of imperial identity from commander to middle-man was a growing anxiety over the decadence and decline of the English race and an increasing sense of guilt over the crimes of empire. Critics

like Yumna Siddiqi and Diane Simmons discuss how late-Victorian literature was haunted by specters of insurgency, counter-invasion, and cursed returned colonials, and Diane Hoeveler noted the way the text plays on fears of eastern European immigrants, who were drawn to England and specifically to London.

Dracula is himself no stranger to life on politically valuable real estate. Likening Stoker's work to "invasion scare novels" (110), Stephen Arata points to the scene in which Dracula relates some of his country's past to Jonathan Harker: "there is hardly a foot of soil in all this region that has not been enriched by the blood of men, patriots or invaders" (Stoker 27). It would be difficult for any reader not to be reminded of Britain. The Count completes the parallel by relating this to his own racial identity as a conqueror. He defines his race Szekely (szeek-lay) as a product of conquest, posing the rhetorical question, "Is it a wonder that we were a conquering race?" (34) The question, prompting any Norman/Anglo-Saxon/Brit to reflect likewise, reveals Dracula not merely as threat from the East and past but also a dark prophecy. It is dangerous to be a hub.

And Dracula is all the more dangerous by his desire to pass, to move unnoticed among proper British people. The Count, as Arata notes, is not satisfied with merely owning British property or even British citizens. He wishes to own Britishness, to consume it as he will the British themselves, and this is what makes Dracula truly perilous. He practices his accent with Harker and makes a keen study of London geography; he devours maps of the city as if they were hors d'oeuvres. And into this feast steps the foreign protector and professional sore thumb, Professor Abraham Van Helsing.

Unlike Dracula, as Christine Ferguson remarks in her chapter "Standard English at Stake in Stoker's *Dracula*," the Dutchman is "blissfully unconcerned with correctness" (Ferguson 144). Dracula attempts to mask his unsettling appearance—sharp teeth, pointed ears, hair palms, and rank breath—beneath English dress and accent. In contrast, Van Helsing, whose form is easily mistaken for that of an upstanding Brit—medium height, well balanced, broad and "noble" forehead, with a "good-sized" nose, blue eyes, though the hair is "reddish"—allows his accent to persist (163). And the text gives us every reason to conclude that his accent is just that conscious.

While I agree with Ferguson that Van Helsing's dialect serves his social goals, and I too find the "King Laugh" speech captivating in its disruption of social and linguistic tension, I would disagree with her characterization of the doctor as ignorant of this impression. Van

Helsing's considerable English education—including a doctorate in literature (97)—combined with the lack of shift between his speech as reported by others and his own written word suggest his foreign-sounding grammatical patterns are, if not necessarily manufactured, at least carefully maintained. Writing on the “King Laugh” speech in which Van Helsing describes to Seward just what was so funny about Lucy's funeral, Ferguson rightly says that there's scarcely a way to adequately deliver the lines but in a foreign-sounding dialect (144-45). Gaze upon Dracula, poring over his maps and guidebooks, planning his army of equally ignorant solicitors, and compare this with Van Helsing giggling at Lucy's funeral. Unlike Dracula, who desires to disappear into Victorian society, no one could ever lose sight of Abraham Van Helsing. The Doctor reassures the English that his stay is temporary and easily observed. He signals to the Victorians that he is precisely what they want, a slightly uncanny ally of their own who will be there when they need him to be there and who will be out of town the rest of the time.

Again, his foreignness is another signal of his utility because Van Helsing is not merely foreign, but international. Stoker reminds us repeatedly that Van Helsing is comfortable operating on a larger stage and shows us the usefulness of this quality. Aside from his home in Amsterdam, Van Helsing occasionally references and turns to his network of fellow academics. Van Helsing gets his garlic flowers from a Vanderpool in Haarlem (Stoker 113) and, as previously mentioned, it is his friend Arminius of Buda-Pesth University is the source who finally confirms Dracula's identity and history (206). Van Helsing's deft global touch is quite different to Harker's English bumbling through eastern Europe. Without Van Helsing's global bona fides, without a member who was not just of England but of Europe, the Crew of Light could never defeat Dracula. In this way, Van Helsing comes to resemble what Siddiqi terms the “hybrid and flexible” identity that makes some of the most noted heroes of early spy thrillers, such as John Buchan's foreign-born Richard Hannay, a South African of Scottish descent whose zealous patriotism Allen Hepburn links to a foreign birth (Siddiqi 32). Even more than for his Texan namesake, young Quincey Harker is the physical manifestation of Van Helsing's virtues. He, like Britain itself, is the hub of an impressive network of knowledge and power.

Van Helsing's use of networks and foreignness also combine in his identity as a chaste Catholic. All of the characters in *Dracula*, including the Count, demonstrate care for England via a romantic attachment to English women. Arthur, Seward, and Quincey are all suitors of Lucy, whom Van Helsing also adores. After Lucy's death(s), all of the men join Jonathan in devotion

to Mina Harker. In *Reading the Vampire*, Ken Gelder points out the Sedgwickian triangulation of homosocial desire around first Lucy and then Mina (Gelder 59-60). Dracula's desire is, of course, evil, polluted and a pollutant. Van Helsing, however, can be trusted to be devoted without hope of possessing because the chasteness of his love is religious rather than purely gallant. A good Catholic, Van Helsing remains faithful to his wife, who, as he tells Seward, has lost her mind but remains "alive by Church's law" (151). He is in a sense neutered by his religion. Thus, Van Helsing can be allowed to devote himself to Lucy and Mina with all the purity of a knight and with no Dracula-esque threat of foreign amore. In fact, this makes him the safest man to organize a group of men formed around a woman and to direct their passions. Van Helsing is not English by nationality nor by religion, and that is why he can guide this pack of warriors for England.

Head Scientist for the London Preservation Society

Van Helsing's networking and foreignness come together with his coldness in his ability to think beyond the Crew of Light. Though she may provide focus for the efforts of the rest of the Crew, Mina is not Van Helsing's only or even primary concern. Like himself, Van Helsing's goals are international and, consequently, allow him to pursue knowledge of his foe.

Van Helsing, by mutual consensus, becomes leader of the Crew of Light, fashioning them into a student body with himself as the instructor; they "unconsciously formed a sort of board or committee" in Seward's study with Van Helsing at the head (182, 202). Van Helsing instructs the Crew of Light on the global nature of their duty to rid the world of Dracula and his brides. In speaking with Harker, who can only see the situation in terms of the threat to Mina, Van Helsing accepts the limits of his audience and frames his globalizing rhetoric in personal terms, and it works. By the end of the talk, Harker is ready to "sell my soul," not to save Mina but to "wipe out" Dracula (265). In his maneuvering of the group, Van Helsing only seems to lose his composure once. In answer to Mina's repeated questioning as to the necessity of the hunt for Dracula, Van Helsing shouts, "Yes, it is necessary—necessary—necessary! For your sake in the first, and then for the sake of humanity" (274). Again, it is the importance of Van Helsing's skill as a networker, a hub of relationships and knowledge, that make him a valuable presence. Van Helsing is a hub done right.

Despite his devotion to his ends, the pursuit of the vampire and its destruction, Van Helsing escapes categorization as a mad scientist not merely because his ends are beneficial to England or even because he is loyal to his friends. Van Helsing preserves the moral and scientific status quo. Despite all he has learned which would provide fodder for further scientific inquiry, inquiry which might result in a paradigm shift or at least a host of valuable-if-troublesome discoveries, Van Helsing displays no interest in the publication of these events or his work in relation to this case. A different kind of networking has come out of the exploit. We last see Van Helsing bouncing young Quincey Harker on his knee in the epilogue. And, as he engages in behavior designed to strengthen his personal relationships, he dismisses the need for the very text in which he appears: “we want no proofs; we ask none to believe us” (327).

As much as Dracula’s death, the newest Harker is the product of Van Helsing’s work. Quincey Harker, through Mina, Dracula, and Lucy, has the blood of every member of the Crew of Light except for Quincey Morris, from whom he takes his name. Van Helsing places importance not on disseminating his knowledge to the world or even the scientific community, but specifically on what his progeny will understand. He has discovered but has no desire to destabilize. “This boy will some day know what a brave and gallant woman his mother is. Already he knows her sweetness and loving care; later on he will understand how some men so loved her, that they did dare much for her sake” (327). The boy is a living embodiment of Van Helsing’s skills at networking and the next generation bound to ensure that the professor will always have a place to come and work.

Van Helsing is an idiosyncratic personality who nevertheless excels as a networker with many colleagues but without a partner. In the next chapter, I would like to examine an equally successful, perhaps even more idiosyncratic scientist, Sherlock Holmes, who is without peer in his field and yet who relies heavily on his partner Watson to enable him to occupy the social niche he has perceived.

CHAPTER FIVE—THE BAKER STREET IRREGULAR: SHERLOCK HOLMES



It would be difficult to overstate the contemporaneous or lasting impact of Sherlock Holmes, The World's Greatest Detective. Holmes first appeared in the novel *A Study in Scarlet* in 1887 by Sir Arthur Conan Doyle, who was 28 at the time, and thenceforth featured in 56 short stories (usually published in *The Strand* before being collected into books) and three further novels, all by Doyle, and all of which appear to take place between 1880 and the outbreak of World War I in 1914. Holmes was incredibly popular, something Doyle seems to have resented. He famously attempted to kill the great detective in "The Final Problem" in 1893 so that he could turn his attention to what he considered more worthwhile literature. However, pressure from fans and publishers eventually persuaded Doyle to bring Holmes back with *The Hound of the Baskervilles* in 1901, set before "The Final Problem," and eventually resurrect him in 1903 in the story "The Adventure of the Empty House," the first story of the collection entitled *The Return of Sherlock Holmes*. Doyle continued to publish other works, but Holmes was his lifelong companion. The last story, "The Adventure of Shoscombe Old Place" and the last story

collection, *The Case-Book of Sherlock Holmes*, were published in 1927, just three years before Doyle's death in 1930 at 71.

Holmes overshadows the entire genre of detective fiction. There were fictional detectives before Holmes, most notably Poe's Dupin, but none before Holmes featured in so many stories or inspired such devotion. Before Doyle killed Holmes in text, he attempted to end demand for him by setting such exorbitant fees for Holmes that his publishers would stop requesting them. Instead he found himself one of the most highly paid authors in the country. In response to the "The Final Problem," 20,000 fans canceled their subscriptions to *The Strand*. Holmes continues to loom over detective and mystery fiction through adaptations and influence ranging from the semi-contemporary Hercule Poirot, whom Christie began writing in 1920 as a sort of pastiche of Holmes, to recent film and television shows like *Monk* and *Psych*, all of which continue to assert the importance of observation. DC's Batman is another modern inheritor of the title The World's Greatest Detective.

Along with being a detective and a celebrity, Holmes is a hazardous scientist—a point which seems key not only to his enduring popularity but also to constructions of the scientist-as-detective. Holmes is particularly useful for this study because of his long character arc: he is a hazardous scientist whom we can see find his place in society over the course of four decades. He fulfills all the criteria for our spectrum—brilliant, abnormal, monomaniacal, and amoral—to some degree, and in his approach to science, he positions himself as a mad scientist in both the Kuhnian and Badiouan sense. First, Holmes is trying to establish a new science, a science of deduction, which is inherently not "normal science," as only an established science can have a paradigm under which one can work in any normative way. Second, he is attempting to develop this new science of deduction in order to find the truth but also to share a Truth. Holmes' greatest desire is to throw himself into situations in which the truth is as obscured as possible and to somehow pierce the veil to experience another event. He lives for what I have been calling "tesseract moments." These experiences are part of his larger mission to communicate the importance of his approach to criminology and to life, and to spread his understanding, as all those must who are faithful to their events. Luckily for Doyle's fictional Britain, Holmes pursues his bliss by becoming a sort of private civil servant. Through this role as the "only unofficial consulting detective," "the last and highest court of appeal in detection" (40), Holmes develops relationships with institutions and individuals across the length and depth of the socioeconomic

scale. Of course, in turn he gets support and the work itself, which he craves and without which he is a danger to himself and, we imagine, others.

Doyle's stories turn primarily on the cleverness of the puzzles which Holmes solves even to the point that giving clues to allow the reader to play along is secondary to featuring Holmes's brilliance. As a consequence, Holmes's development as a character is something that has to be looked for rather than something featured. Nevertheless, Holmes' character begins to shift drastically by the second novel, a noted step in his transition from a life of hazardous isolation into a place of productive socialization. It is an effective transformation that scales up emotional bonds from the small and particular to the large and more abstract. Holmes is able to use his micro-level obsessions as a foundation for macro-level affinity, even affection, for his fellow human beings. What is more, this is a kind of success of a Badiouan fidelity to truth and a Badiouan search for events. Holmes' belief that careful observation of details can reveal truths, that whole pictures can be imagined by full consideration of their traces.

In this transformation from solo, unsettling genius to respected, networked scientist, the figure of Sherlock Holmes makes a great argument for collaborating with hazardous scientists. Holmes, and Britain, are fortunate that Holmes begins with an interest in society, that his interest in crime is, if not *from* a social perspective then *in* a specific social situation. For Holmes, the greatness of London is a Truth, one that is fundamental to the formation of his new science. Likewise, by the first novel, Holmes is already at least coming to understand the utility of a working relationship with Scotland Yard, even if he finds Lestrade to be only "the best of a bad lot" (14). It is his most personal relationship that enables Holmes' growth. Holmes' professional relationship to Scotland Yard and his personal relationship to Watson are critical to both his social utility and his evolving humanity, and both relationships provide an opportunity for oversight and involvement in his work. The only deeper connection that Holmes exhibits is his devotion to the city of London and knowledge of every part of it, another association that is integral to his work and, like his initially limited relationships with Watson and the Yard, something upon which he can build the arc of character as at once deep and networked. In what follows, I want particularly to consider the development and utility of these social, personal, professional, and urban networks, which are key to understanding Holmes and, as I have been arguing throughout the larger project, the socialization of the scientist in Victorian Britain. We see the utility and the brilliance of Holmes' networking in his relationship to his network of

urchin informants, the “Baker Street Irregulars,” and in contrast to two key figures in the Holmes canon: Sherlock’s brother, Mycroft, and his nemesis, James Moriarty. Why those networks matter for the history of both mad science and detection—and the science of detection—is what I hope to demonstrate in this chapter.

Holmes the Scientist, Learned and Dangerous

Before further exploring the way in which Doyle fits Holmes into his society, it is worth a little time to establish Holmes as not only a scientist but also a preeminent and potentially mad one.²³ Of course, Holmes’s preeminence was recognized by Doyle’s own inability to free himself from the character.²⁴ Holmes’s is also the father of a new science, the science of deduction.²⁵ A *Study in Scarlet* (1887) and *The Sign of the Four* (1890) both include a chapter titled “The Science of Deduction.” In both instances, Watson, is surprised by the way in which Holmes’s science works, even though Watson is himself an educated man and a doctor. Indeed, if we return to the terms of this project’s first chapter and to its graphic depiction of scientific change,

²³ There has been some discussion in recent years as to Holmes’s status as a scientist. In “*The Hound of the Baskervilles*: Modern Belgian Masters, Paralyzing Spectacles, and the Art of Detection,” Nils Clausson uses one of Holmes’s most famous cases to posit that it was Holmes’s “contemplative stance of art connoisseur and aesthete” rather than the scientific methods of investigation that solves the case (Clausson 37). Anna Neill takes this train of thought further in “The Savage Genius of Sherlock Holmes,” arguing that Holmes was a bulwark against degeneracy not through his reasoning but rather a subconscious awareness that gave him a “divinatory” intuition (Neill 611–12).

On the other side, Susan Cannon Harris, in her article “Pathological Possibilities: Contagion and Empire in Doyle’s Sherlock Holmes Stories,” uses “The Dying Detective” to frame the imperialistic view of Holmes in a scientific context. Harris paints Holmes as a medical/medico-criminal expert, a new kind of doctor needed for Doyle’s Britain, in which imperial possessions were written as sources of disease, social as well as biological, and the city in particular served as a nexus of contagion (Harris 447–48). For a more specific look into the scientific techniques Holmes uses and their relation to contemporaneous forensic science, see E. J. Wagner’s *The Science of Sherlock Holmes*.

²⁴ Doyle’s mixed feelings concerning Holmes as his road to literary fame have received much comment. In an often-quoted letter to his mother in November of 1891, Doyle laments, “I think of slaying Holmes in the sixth & winding him up for good & all. He takes my mind from better things” (300 Lellenberg et al.). It would be another two years before he did so, in “The Final Problem,” but the public’s thirst for Holmes would convince him, reluctantly, to bring back the detective in 1903 (514).

²⁵ It has become common to pick on Doyle’s use of the term “deduction” and argue that the logic Holmes employs and describes in these chapters and elsewhere is technically inductive reasoning. In truth, *abductive* might be the best word for Holmes’s methodology. Deductive reasoning is syllogistic. It begins with a general truth (all men are mortal), examines a specific instance (Socrates is a man), and comes to a conclusion (Socrates is mortal). Inductive reasoning is the reverse, moving from observation (seeing many men die) to general theory (all men are mortal). In fact, Holmes’s generally produces his “deductions” via abductive logic, which is similar to inductive logic with the understanding that the information available is incomplete, and so the conclusions can only be best guesses. Abduction involves a certain amount of creativity or intuition. However, the fact that Holmes is establishing his own paradigm necessitates that he is also creating his own general truths and then applying them. Really, Holmes regularly employs all three of these forms of reasoning.

we see that, regarding the Kuhnian merry-go-round of scientific progress, Holmes is... not even on yet. This early, Holmes is essentially in a pre-science state by Kuhnian terms; see Fig. 4 below.

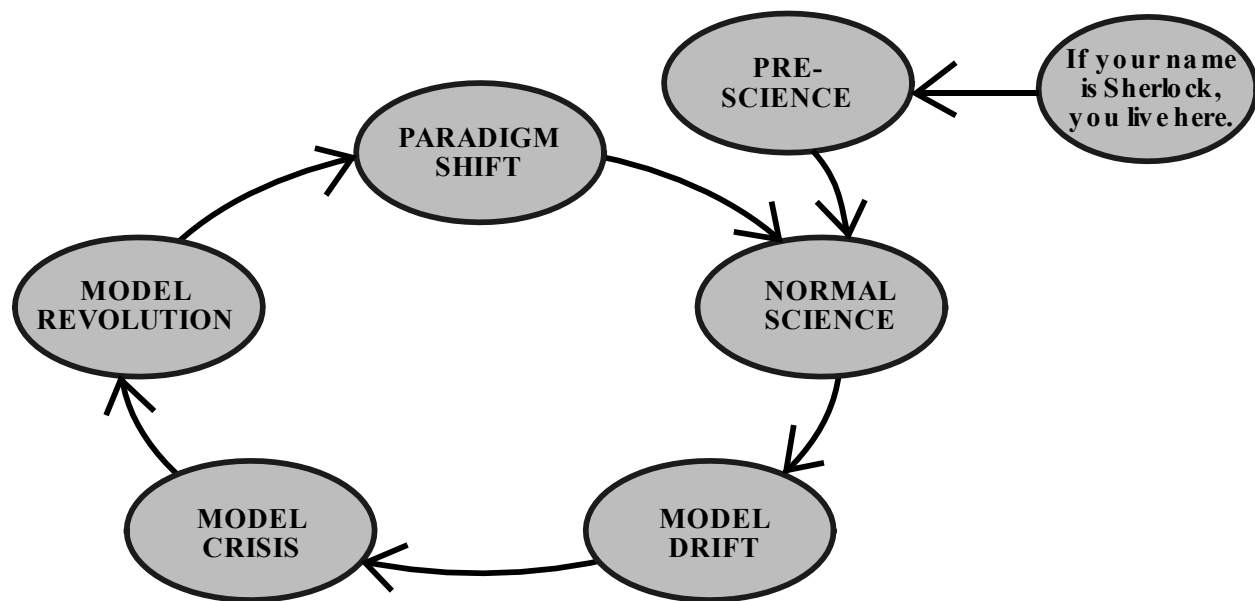


Fig. 4

This is not to say that Holmes and his science are not scientific, merely that their development is still in its early days in the beginning of the series. He is in the process of developing his paradigm. Holmes does have a few pupils; aside from Watson, in the very chapter mentioned from *The Sign of the Four*, Holmes mentions a French detective, a François Le Villard, whom he has assisted and who he believes has the makings of a great detective. However, despite these, and despite his many monographs, Holmes is not shown developing his field in concert with other scientists. The paradigmatic structure is still very much at his individual discretion. That affords him a position of great authority, but it puts him in the position of an outsider. Holmes is brilliant, as one might expect from the founder of a science, a position that makes him abnormal from a scientific perspective. He is also just a strange man.

In *Sign of the Four* even Watson calls him a “calculating machine” and says there is something “positively inhuman” about his inability to notice that a particular woman is attractive. Holmes responds that the woman, as a client, is “to me a mere unit,—a factor in a problem” (43). On the other hand, Holmes is not at all put out when he meets a fellow obsessive, as in the surgeon James Mortimer who comes to Holmes on behalf of Charles Baskerville in *The*

Hound of the Baskervilles. Mortimer is a hobby phrenologist and, before their meeting commences, asks Holmes for a cast of his apparently remarkable skull “until the original is available” (285). In response Holmes simply notes Mortimer’s enthusiasm for his passion and offers him a cigarette. The police, though they generally come to appreciate him, at times are frustrated by Holmes or even dismiss his apparent talents as ridiculous or mad, as Mr. Athelney Jones does at first in *The Sign of the Four* or as Inspector Forrester in “The Reigate Puzzle” who responds to Watson’s assertion that there is a method to Holmes’s madness by muttering that “some folks might say there was madness in his method” (171).

Holmes’s strangeness is inseparable from his stature as a working scientist, and both are there in the very first description of the character in print. Here we can see not only how Holmes’s scientific nature was highlighted, but also how it is portrayed as monomaniacal and amoral in a Badiouan way. The description is given to Watson by a mutual acquaintance, Stamford, in *A Study in Scarlet*. Stamford informs the newly returned-from-war doctor of another man in need of a roommate, a “fellow who is working at the chemical laboratory up at the hospital” (9). Stamford describes Holmes, who has “amassed a lot of out-of-the way knowledge which would astonish his professors,” as

a little too scientific for my tastes—it approaches to cold-bloodedness. I could imagine his giving a friend a little pinch of the latest vegetable alkaloid, not out of malevolence, you understand, but simply out of a spirit of inquiry in order to have an accurate idea of the effects. To do him justice, I think that he would take it himself with the same readiness. He appears to have a passion for definite and exact knowledge. (10)

Stamford is painting Holmes as the very model of the modern menacing scientist, quite opposed to the spiritualism of Van Helsing. Holmes represents exactly the sort of amoral, soul-denying science that troubled many Victorians. He is not evil per se, but his desire for knowledge threatens to outstrip his moral concerns, or at least the moral concerns of those around him.

Of course, this is not to suggest that Holmes could rightly be termed a sociopath or psychopath, a concept still very much in development in the late nineteenth century by English as well as German psychiatrists.²⁶ What is important here is that British citizens are suspicious of Holmes, and reasonably so. As Holmes readily admits, he is horribly antisocial. When apprising

²⁶ Noted texts here include the German Julius Ludwig August Koch’s *The Psychopathic Inferiorities* (1891) and the British Henry Maudsley’s *The Pathology of Mind* (1895).

Watson of his flaws, Holmes flatly admits, “I get in the dumps at times, and don’t open my mouth for days on end. You must not think I am sulky when I do that. Just let me alone, and I’ll soon be right” (10). While Holmes’s depressions may not make the character obviously dangerous to others, the disclosure of mood swings does mark the detective as at least somewhat mentally unstable and well aware of it. We must keep in mind that, at this point, Watson is considering Holmes as a potential roommate.

Holmes’s mood swings are only one of the noted idiosyncrasies Doyle establishes early on. Watson must also get used to the strange chemical smells from his roommate’s experiments, the sometimes-trying violin ramblings, and of course the cocaine use that the doctor so frowns upon. While these quirks could be passed off as merely making Holmes look prickly, we can hardly ignore that they follow Stamford’s story of coming upon Holmes while the latter was beating corpses to observe post-mortem bruising (10). Again, the logic of the act may be quite sensible, but the performance itself is clearly cause for concern to Doyle’s characters.²⁷ It is this concern over Holmes’s scientific mentality that makes his socializing so crucial to the other denizens of Doyle’s fictional London and to us.

Holmesian Networking

Just like Van Helsing, Holmes is signified safe by his networks. In fact, as a networker, Holmes has a great deal in common with Van Helsing. Like the Professor, Holmes’s networking is largely related to his professional elbow rubbing, and, also like the Professor, despite his off-putting manner, Holmes has people skills to employ when he puts his mind to it. As Watson says in the later story “The Adventure of the Missing Three-Quarter,” “Holmes was a past-master in the art of putting a humble witness at his ease” (265). Holmes also develops some important working relationships by demonstrating his necessity, as he does with the Yard. Holmes begins with a somewhat troubled but quickly evolving relationship with Scotland Yard. In earlier stories, such as *A Study in Scarlet*, Holmes is rather dismissive of the capabilities of the Yard’s

²⁷ It would be interesting, but the study of another paper, to consider how Holmes’s lack of concern for his own image, simultaneous with a craving for recognition of his accomplishments, has been seized upon by adapters of Doyle’s work—from the carelessness Billy Wilder and Robert Stephens’s Holmes shows at being thought to be homosexual by other Victorians in *The Private Life of Sherlock Holmes* (1970) to Steven Moffat and Benedict Cumberbatch’s incarnation’s frank description of himself as a “high-functioning sociopath” in the first episode of the BBC’s *Sherlock*. Though, it is highly debatable whether any of that excuses wearing a deerstalker in the city.

personnel (13, 14), and Lestrade in particular is noted for his forthrightness but also his thickheadedness, being “still a sceptic” of Holmes’s methods even by “The Boscombe Valley Mystery” (92). Yet Lestrade does manage to learn something from Holmes. More importantly, the Yard as a whole learns to appreciate the detective, as Lestrade tells Holmes at the conclusion of “The Adventure of the Six Napoleons” just how proud the Yard has become of the detective, that “there’s not a man, from the oldest inspector to the youngest constable, who wouldn’t be glad to shake you by the hand” (253). It is such a surprisingly heartfelt moment, that the stoic Holmes himself has to turn away. Watson remarks that the detective seemed “more nearly moved by the softer human emotions than I had ever seen him” (253). Though, what really matters more to Holmes, rare emotional outburst aside, is that the Yard learned to use him, had adapted to the social position he defined for himself all the way back in *A Study in Scarlet*: the world’s first and only “consulting detective,” a detective whom other detectives, both private and government employed, would come to with their best cases to be “put on the right scent” when a puzzle stymied them (13).

Another thing that distinguishes Holmes as a networker is the direction in which his networks stretch. While Van Helsing cultivates relationships with doctors, lawyers, and lords, Holmes most famously forms connections with the not only the police, but also street urchins. For Holmes, the most important group of colleagues after the Yard, is the Baker Street Irregulars, the band of “street Arabs” Holmes uses to gather information. Holmes’s dealings with the Irregulars show Holmes’s social usefulness as well as his cunning. As Rosemary Jann notes, the Irregulars not only are prime examples of Holmes’s ability to utilize society’s blind spots but also show how Holmes is able to employ “more effective social control than the official police could produce” (Jann 696). Again, I would shy away from terms like “social control,” but Holmes clearly has a sense of the workings of London and the way they can be utilized that the Yard (at least Doyle’s Yard) does not. The Irregulars appear most notably in the first two Holmes novels, *Study in Scarlet* and *Sign of the Four*. From the introduction of the Irregulars in *Scarlet*, during which Holmes hands them their “wages,” it seems that Holmes pays the boys regularly for whatever information they can bring him as well as extra for particularly useful clues. As Holmes tells Watson, “There’s more work to be got out of one of those little beggars than out of a dozen of the force....The mere sight of an official-looking person seals men’s lips.

These youngsters, however, go everywhere and hear everything. They are as sharp as needles, too; all they want is organisation” (20).

I said that I preferred to avoid the connotations of “social control,” but the end of Holmes’ remark demonstrates that Jann makes a point with her choice of term. It is unclear how much Holmes has to do with it, but the boys do have a leader, Wiggins, and Holmes reinforces Wiggins’ status in *Scarlet* by telling the boys that in the future, possibly in the interest of keeping the peace with landlady and housekeeper Mrs. Hudson, only Wiggins will be allowed into 221B. He says this after calling “Tention,” at which the boys snap to like soldiers (20). Later in *Sign* Holmes refers to the Irregulars as the gang of “my dirty little lieutenant, Wiggins” (55). While Holmes may not have taken control of the boys’ lives, he does speak of them as his employees, even his own personal police or even military organization. Again, it is unknown how responsible Holmes is for the social order of the Irregulars, but even if he is responding to a preexisting pecking order, he is reaffirming it. It is a reminder that, however much a man of the shadows and fringes Holmes may be, he builds and maintains his position at least in part by reinforcing social order. This combination of a facility for fringes and a utility for the social order allows Holmes to maneuver both through London and through British society as a whole, and it is the basis for the reciprocity necessary for a productive relationship between scientist and city/society.

As a networker, Holmes is contrasted with Doyle’s other highly connected geniuses, Holmes’s brother Mycroft and his nemesis James Moriarty, all three being professional consultants of sorts. Holmes is differentiated from both of them by their approach to networking. For Holmes, it is a matter of reciprocity. For the other two, it is one of control. In addition, where Sherlock prowls the edges of systems, building networks and working with those he finds, Mycroft and Moriarty are occupiers of hubs, more spiders than lions. Mycroft is smarter than Sherlock, and in that sense even more potentially dangerous, but he would never directly harm anyone, or indeed do anything directly. Like Holmes, he has carved out his own consulting position and thereby made himself indispensable (391), but Mycroft is defined by his laziness. Mycroft is an organizer and thinker rather than a scientist. He has no interest in running experiments; as Holmes says, he does not care enough to check and see if he is right (185), a rather crucial step in the scientific method. Holmes says of him that “if the art of the detective began and ended in reasoning from an arm-chair, my brother would be the greatest criminal

agent that ever lived” (185). Though he has an intellect greater than Sherlock’s, Mycroft is without the latter’s driving curiosity or need for action

In Kuhnian terms, Mycroft’s laziness means he would only ever work under an existing paradigm. He does not have the oomph to break new ground. Sherlock wants to solve puzzles to encounter truths, and Mycroft wants to solve puzzles to be comfortable. As a consequence, while Holmes runs around, often through the fringes of society, Mycroft sits at its center. Mycroft’s intelligence and preference for continuity make him the perfect person for reinforcing the status quo. As the head of a government, Mycroft is almost an indictment of notion of a philosopher king. He has all the intellect of the greatest philosopher, and that intellect, rather than prowess in battle or popular support, is what has put him at the hub, but he has no particular drive to innovate or even personally involve himself. In that sense, intentional or not, he is also an indictment of empire. For an empire on the top, one that is naturally concerned with preservation and fears degeneracy, he is an absolute get. Put him at your hub, tie the satisfaction of his wants to social equilibrium, promise to bring him whatever he likes if he does your thinking for you, and your status quo is practically guaranteed to the point of stasis.

And hub, center, head—these are all apt descriptions for Mycroft’s place in the British government, and they also define all the relationships we see him have. Sherlock has relationships all over London, and Mycroft has relationships with underlings he sends out all over the world, presumably from his office or from the Diogenes Club, a hilarious appellation for the napping hall of a bloated take on the philosopher king, being named for the cynical ascetic who mocked Alexander the Great to his face. Mycroft sits at the center and commands from the center, not for himself, not exactly, but for the good of Britain which is also good for himself. Where Sherlock’s relationships are organic and evolving, Mycroft’s are formalized and build into the mechanism of state or the clockwork routine of the Diogenes Club which is perhaps even more concerned with propriety. Mycroft is a very different way for genius to find its niche in society, and one that does not apply so readily to scientific genius given to destabilizing curiosity and invention. Sherlock could never be Mycroft. But Doyle does provide us with a twisted mirror to his detective in Professor James Moriarty.

Moriarty is the other of Doyle’s consulting hubs, and a much more arachnid, as opposed to mechanistic one. In fact, Holmes even describes Moriarty as a spider to Watson, explaining that Moriarty “sits motionless, like a spider in the center of its web, but that web has a thousand

radiations, and he knows well every quiver of each of them. He does little himself. He only plans” (200). Later, Doyle expanded upon Moriarty’s nature to reveal one who not only planned but commanded, ruling “with a rod of iron over his people” (332). The disdain in Holmes’ words does a little to demonstrate the moral difference between them. Holmes is neither evil, nor a machine. He is no Moreau. He may have a lack of respect for social norms, but, like Van Helsing, he has a sense of morality that exists aside from and even influencing his work. Like Van Helsing, that moral sense is manifested and developed through his relationships with institutions and individuals. Holmes’ disdain also points to a manifestation of this evil and a manifestation of their moral difference, and difference in approach to work, Moriarty’s employment of command as a style of networking.

It is important to pause here to consider just how difficult it is to describe what this text and those addressed in previous chapters suggest is the ideal relationship between a society and its scientists and the process by which they can reach which a mutually beneficial relationship, a symbiosis or even a friendship. Would we call that process befriending the scientist? Socializing the scientist? Symbiotizing the scientist? Even befriending carries with a certain connotation of one party acting upon another. We find ourselves trapped by our language’s, our culture’s, tendency to simplify, cloud, or outright disbelieve in the potential for egalitarian relationships. What we want is direct and clear language to describe a complex process by which a fluid and adaptive symbiosis is reached that is at its best when neither party feels or is being taken advantage of but instead can develop a trust and affection for the other party. The English language offers a plethora of nouns and an ocean of verbs for dominance: to train, tame, direct, domesticate, cultivate, control, subdue, utilize, employ, exploit, and the list goes on. It is easy to imagine such relationships of dominance, and it is easy to describe their order; they are built and operate from the top down. Our language seems much more circumspect, much more skeptical when it comes to the mutually collaborative *and considerate* approach that can build a reliable network. This linguistic condition is a symptom of a culture’s approach to association, one which these narratives argue is the perfect petri dish for growing mad science.

It is ironic that Holmes’s greatest foe, the arch-criminal who breaks every rule, and his brother, the government agent who maintains the status quo, should be so aligned in their methods of operation. Moriarty and Mycroft are both networkers, but their networks are organized from the top down and work through dominance. Mycroft sits at the hub of an

empire's wheel. Moriarty has built his own empire, for which Holmes calls him the "Napoleon of crime," though he does not sit (200). Obviously, as a criminal, Moriarty cannot depend on the integrity of a chain of command to the degree that Mycroft can. He must, as a result, take a more creative approach to enforcement, balancing the risk and rewards of violently removing underlings. Though as a last resort, he is even willing to engage even if personal physical combat. There is something organic about this, though frightfully so, but it is also commanding. Moriarty does not have colleagues like Holmes and Van Helsing and even Mycroft, but rather he has servants like Dracula. Like the Count, he is similarly unfettered by even a loose regard for moral and legal restrictions. Moriarty can use his henchmen to affect actions Holmes cannot. Though, crucially, he must keep the violence at a distance.

Holmes is creative with his intimate style of networking, but Moriarty's creativity is directly related to his detachment as an organizer. In *The Valley of Fear* (1915), the final Holmes novel published though it is set before his confrontation with Moriarty, Holmes asks Watson if he recalls him speaking of Moriarty. Watson responds by recalling him as "the famous scientific criminal" (328). Holmes cautions him, saying,

But in calling Moriarty a criminal you are uttering libel in the eyes of the law—and there lie the glory and the wonder of it! The greatest schemer of all time, the organizer of every deviltry, the controlling brain of the underworld, a brain which might have made or marred the destiny of nations—that's the man! But so aloof is he from general suspicion, so immune from criticism, so admirable in his management and self-effacement, that for those very words that you have uttered he could hale you to a court and emerge with your year's pension as a solatium for his wounded character. Is he not the celebrated author of *The Dynamics of an Asteroid*, a book which ascends to such rarefied heights of pure mathematics that it is said that there was no man in the scientific press capable of criticizing it? Is this a man to traduce? Foul-mouthed doctor and slandered professor—such would be your respective roles! That's genius, Watson. But if I am spared by lesser men, our day will surely come. (328)

Holmes, though a master of disguise, networks publicly and becomes a public figure. His identity, his passions, and his profession are all one in the same. He has established his larger relationship with society and proves his friendship through his work and his networking. In this sense, Moriarty is his opposite, his shadow as a professional and as a networker. As Holmes says in "The Final Problem," "he is the organizer of half that is evil and nearly all that is undetected in this great city" (200). Moriarty projects an air of safety through what is essentially a false identity

as a scientist producing purely academic work, and this is the cover for his real scientific practices as the master of London's criminal world.

Holmesian London

This brings us back around to the most crucial weave of the social fabric into which Holmes was embedded: London itself. What makes Holmes acceptable and useful to the city is the firmness with which he is embedded in London. When we imagine Holmes as a preeminent scientist of fictional late Victorian London, we cannot forget the importance of London in that illustration. Again, in contrast with Van Helsing, Holmes is first and foremost a citizen of London, and, though he occasionally takes work outside the city and applies his theories there, Holmes is also a scientist of London. Doyle makes London the detective's home and the object of his study. It is also not the first time we have seen a London lab, for heroes or villains.

Of the scientists in this study, only Moreau left London entirely, and he was forced out. Jekyll and Hyde were also creatures of London, particularly Hyde. Jekyll secluded himself and shut up his laboratory until his only dealings were with chemists for deliveries, Hyde set out to experience London. London at large, as opposed to indoors, was also the site of at least one experiment for Van Helsing, when he allowed manipulated Lucy after her transformation into a vampire in order to demonstrate her vampirism to the other men. And, of course, Dracula himself was intensely interested in London, maybe the only character in this study as interested in London as Holmes. Again, unlike Van Helsing and unlike Dracula, Holmes is a citizen of London, but, like them it seems that Holmes was possibly not a Londoner by birth.

Again, Doyle's preference for a focus on the brilliance of the puzzle and its solution made Holmes's character development secondary, and that went double for his backstory. Nevertheless, there is a suggestion that Holmes is a transplant. Holmes and Mycroft are both educated men, and neither's choice of work suggests a working-class background. At the same time, Sherlock Holmes's desire for a roommate makes it seem unlikely that the Holmes family is rich or has a residence in town which he can occupy. In "The Greek Interpreter," Holmes tells Watson that his "ancestors were country squires" (185). He also tells Watson in this same paragraph that his grandmother was the sister of a French artist, Vernet. There has been a fair amount of theorizing by Sherlockians as to what this all means, but regardless of the specifics of the Holmes family history, it seems that the Holmes family and possibly Holmes himself were

well off or at least moderately well off and at least moderately traveled or connected rural gentry as recently as Holmes's grandparents' generation. Holmes's presence in London is likely a choice. He came here to do science.

Holmes was certainly not alone there. London was the scientific hub of Britain just as it was a political and cultural hub. Oxford and Cambridge handed out the degrees, but London was where science was being done. It was a nexus for invention and innovation, where the most people were encountering and using the newest science. The mapping of the city, as with the work done by Henry Mayhew and others, brought advancements in the study of economics, disease, and urban life. Partly as a consequence, urban dwellers themselves were being viewed in scientific terms—from the emerging social sciences of ethnography and urban cartography, to the health and economic sciences, along with the nascent data sciences.²⁸ The Metro train system became integral to city life. By the close of the nineteenth century, half of London's hours were conducted under the glow of electric lights, changing the very look of the city. At the same time, photography and film were becoming industries in their own rights. Interestingly, each of these developments cast a kind of shadow, producing darker or obscured technologies. The city maps showed just how close to one another the upper and lower classes lived. While the Metropolitan train systems ferried citizens in the light, the London Underground traveled below. The very existence of lights, whether gas or electric, cast literal shadows, putting into stark relief those alleys and backstreets that were left unlit. New developments in photography were synonymous with new developments in pornography, and one of the revelations of the continued mapping of

²⁸ Henry Mayhew's seminal *London Labour and the London Poor* saw serial publication in 1851–52 and then a larger four volume edition in 1861. This publication, including interviews with London criminals, would have been in Holmes's youth, if we are to believe the description in "His Last Bow" that he was sixty in 1914 (though he was in disguise at the time, so it is debatable). Holmes would also have seen multiple editions of Peter Cunningham's less scientific *Handbook of London*. Charles Booth's followup to Mayhew's work, his *Life and Labour of the People in London* was published in four volumes spanning most of Holmes's career, from 1889 to 1903. The famous Poverty Maps are a standout feature of Booth's work. The maps showed in incontrovertible full color what the Great Stink more than hinted at three decades earlier, that London was a great mixed mass with all the classes far more geographically mingled, and thus more interdependent, than many cared to think. There were many works during this period, spurred on by cholera, on disease in the city, but this view of London would have been just as important to a student of London's crime as it was to Chadwick and Bazalgette, the men most responsible for London's sewer system. I have already touched on some of the works dealing with the production of science in Victorian London, but *Victorian Babylon* (2000) by Lynda Nead puts much of this in the context of technological development as well as social progress. *Contagion, Isolation, and Biopolitics in Victorian London* (2017) by Matthew Newsom Kerr is an excellent resource for not just the medical side but the interaction between medicine and politics in the city. *Filth* (2005), edited by William A Cohen and Ryan Johnson puts some of this into a more international context. Liza Picard's *Victorian London* (2005) is more in line with Mayhew's less data-driven work, excellent for the would-be time traveler. Holmes himself might be more interested in the look into Victorian criminology from *The Ascent of the Detective: Police Sleuths in Victorian and Edwardian England* (2011) by Haia Shpayer-Makov.

the city was the expanse of “obscene” materials beyond the famous Holywell Street, a.k.a. Bookseller’s Row. As was touched upon in Chapter One, apart from technology, even the study of science itself was not restricted to the laboratories of gentlemen or even scientific professionals but was being practiced by tradespeople and all manner of interested amateurs from a variety of classes throughout the city. All of this innovation, potential for change, and especially the development of so many shadowed realms, so many new ways to view and practice science as well as to view and practice criminality would surely make London *the* place for someone with the interests of Sherlock Holmes, just as it was for his own shadow, Moriarty.

Even Watson, though he does not fully comprehend its meaning, soon picks up on the centrality of London to Holmes’s character. When first trying to puzzle out his new companion’s field of interest in *A Study in Scarlet*, Watson is shocked to learn that Holmes has not even an elementary knowledge of the nature of the solar system to the point where he expresses disregard for whether the earth revolves around the sun or the moon (11-12). Watson makes his famous list (referred back to in the later case “The Five Orange Pips” from *The Adventures of Sherlock Holmes*) that clarifies Holmes’s priorities to us, if not to Watson himself. Item #6 on the list says it all: “Geology.—Practical, but limited. Tells at a glance different soils from each other. After walks has shown me splashes upon his trousers, and told me by their colour and consistence in what part of London he had received them” (12). Though Holmes later expands his base of knowledge, it is clear in this early passage that London contains all the earth that is of importance to him.

As surely as Doyle’s London draws Holmes in, Doyle’s London provides Holmes with opportunities to assist in the ongoing creation of his city. This London and this Holmes demanded one another. Doyle’s London, like many literary Londons, is a city of twists and mystery, a mist of confusion created by the shadows of its bustle, of its place as a hub. James Donald begins his *Imagining the Modern City* with the opening to Charles Dickens’s *Bleak House*. Donald rightly picks up on the sense of uncanny that permeates the city with the fog, bringing an air of monstrosity to Dickens’s description, though he does not discuss fully either the bustling density or the accompanying anonymity that give that monstrosity teeth in the passage Donald quotes. Dickens speaks of jostling crowds mixed with mud and a fog that expands into ubiquity (Donald 1-2). It is the sort of environment in which a criminal could perform his misdeed and simply sink back into the faceless grey and muddy masses, and the

three and a half decades between the publication of *Bleak House* and the serialization of *A Study in Scarlet* hardly witnessed a decrease of the population of London. As Stephen Inwood points out, the population of nineteenth-century London “grew by about a fifth every decade until 1891” (Inwood 411); surely London was the place for the ambitious criminologist or criminal who wanted to lose himself in the crowd. Perhaps even more than crime, crowds threatened the castle that was every Englishman’s home: “Crowding not only represented the pressure of many bodies on too small a space ... crowding also broke down social units and hierarchies and as a result, led to indiscriminate mixing. Middle-class urban observers focused particularly on the sexual promiscuity that they believed resulted from spatial proximity” (Marcus 105). Doyle takes such troubling facets of late Victorian London and uses them to introduce its savior and provide him with Watson, his—and thus London’s—most important ally.

The crowding of London is a necessary ingredient in the relationship between Holmes and Watson, chair of London’s Committee to Keep an Eye on Sherlock Holmes. Doyle not only capitalizes on London’s reputation as a hotbed of criminal activity, he shows how the very factors that make the city dangerous, that attract a mind with the interests of Holmes, also provide him with Watson’s company. It is the very facelessness of the city that brings Holmes and Watson together. Watson’s fateful lunch with Stamford, during which his future association with Holmes is planned, would likely never have taken place if the doctor had not just returned from war and were himself without company. Watson says, “Stamford had never been a particular crony of mine, but now I hailed him with enthusiasm, and he, in his turn, appeared to be delighted to see me. In the exuberance of my joy, I asked him to lunch with me at the Holborn, and we started off together in a hansom” (9). Of course, without Watson, Holmes would not be able to afford the rooms at 221B Baker Street, the apartment that becomes such a nexus of London criminology.

In this way, 221B Baker Street and its functions as a household, a place of business, and a laboratory are all dominated by Holmes’s and Watson’s urban relationship. Like Watson, 221B is London’s gift to and demand on Holmes. The necessity of 221B as a laboratory may not immediately be apparent, despite Holmes’s early declaration of his need for a space to run experiments (10). Doyle’s references to Holmes’s experiments demonstrate this lab work as an ongoing part of his life and his partnership with Watson. This can be observed in the strikingly domestic scene in *The Sign of the Four*, in which Watson describes knowing the presence and

activity of his companion via the “clinking of his test-tubes” from the next room, an aural sense evocative of a description of domestic content at hearing dishes being done in the kitchen (57). However, chemistry was only one aspect of Holmes’s science. In truth, as the use of the Irregulars suggests, all of London was Holmes’s laboratory, and every case itself an experiment. Even Pasquale Accardo, who argues against the strict classification of detection or of medicine (his analogous craft for Holmesian detection) as sciences (Accardo 106-11), agrees that the Holmesian ideal is to work within his home lab, “to solve the case without ever leaving his sitting room” (109). In other words, Holmes wishes to make 221B a focal point of the city. Holmes unites this incredible span of London and even global life, not within a standard office, but in the same space he uses as a laboratory and home. This is not at all out of accord with the possibilities of a London apartment but, in fact, a fulfillment of them.

Holmes is a reader of London, and particularly London’s criminal history, as is noted by both Stamford and Watson (10, 12); however, he is also a writer of London and a keeper of London’s history. Donald comments on a similar relationship of recording in W. R. Burnett’s Chicago thriller *The Asphalt Jungle*, referring to the city as the laboratory of sociologists and writers, a space which their work reconstructs as an archive (Donald 7). It is just such a museum, just such an archive that Holmes himself is creating—in his own mind, through his monographs, and of course through the use of 221B Baker Street. However, as Donald’s quote would imply and as we have already begun to see, Holmes’s writing of London through 221B Baker Street is not limited to the criminal.

Just as London wrote the necessity Holmes to be inserted into a space like 221B, Holmes uses 221B in the continuous rewriting of his city. One of the changes moving through Victorian London was an apartmentization, a process remarked upon in Sharon Marcus’s *Apartment Stories*. Though it was a necessary cosmopolitan adaptation to London’s increasingly dense concentration of urbanites, the “Parisian” style of apartment living was, to the English, in opposition to the domestic ideal of the isolatable single-family dwelling (Marcus 84). Despite William H. White’s appeal to do so, “almost no purpose-built apartment houses were constructed until the 1880s,” the era of Holmes (87-88). The English feared the permeability of apartment living, feared that the city had already destroyed the sanctity of the home with its crime (101-102). Holmes’s occupation of that space wrote upon the city the possibilities for an apartment that could display the positive potential for the worst that middle-class Londoners feared about

apartment life. Holmes is a test case for the magnitude of work that can be done in and through the apartment. 221B, as Marcus writes of apartment space, dissolves “the boundary between residential and collective” (Marcus 3). And yet 221B is defined as the household of a man who in the practice of catching criminals is generally a force for patriotism and social order. Barry McCrea sees a more disruptive influence in the narrative role of the non-normative household of 221B, one in which Holmes repeatedly pulls Watson from his heterosexual life back into their queer lodgings “to assist in some ‘dark business’ or other” (McCrea 84). Catherine Wynne, McCrea admits, represents a much larger critical camp when she writes that the detective “preserves the home, chastens female desire and re-establishes the boundaries of class” (227). One of the functions of 221B is to take the social sting out of the potentially subversive relationships.

Holmes and Watson

This give and take between instability and stabilization is the way all of Holmes’s networks and relationships function. Holmes’s very presence throws doubt onto the ability of the police to maintain law and order, but he allows them to take credit for his work, and eventually they come to see him as a valuable colleague. Holmes associates with and gives money to a pack of street urchins, but he brings organization and purpose to them that essentially brings them into the cause of justice. Holmes lives to pursue potentially dangerous and destabilizing truths, but he has accepted a role in society that often requires that he contain these truths for the good of clients or the public order. In order to do all of this, Holmes embeds himself in networks that not only facilitate his work, but that allow society at large to watch him. That watchful face is especially present in the person of his morally upstanding biographer and PR man, Watson, who is entirely won over to Holmes’s brilliance and his worthiness.

Of course, there is an argument that Holmes and Watson’s relationship was itself socially subversive. Yet, if we focus on opportunities for mutual construction and collaboration rather than tension and antagonism, there is no reason these two readings must remain mutually exclusive. There is certainly room to read the partnership of Holmes and Watson as queer and *potentially* socially disruptive. At the same time, it is undeniable that Holmes is defined for the most part by his nonnormative function as a consulting detective and thus his assistance to the policeman, the figure Donald calls “the personification of the power to decipher its [the modern

city's] networks" (Donald 3). This is what Holmes can do for the city. By being both non-normative and normalizing, Holmes creates an opportunity to diffuse tension. Watson, who floats between his wives and his detective, troubles Victorian sexuality, but he does this so that he may report Holmes's doings to the world. And, just as society is served by this troubling relationship, so too is their apartment a representation of Victorian fear, and yet it serves them. And, of course, the pair comes together as flatmates as a result of the realities of London life. Doyle never lets us forget how key Watson is to the function of Holmes first as a citizen of London but then even more as a servant of London.

Whereas Doyle's first Holmes novel takes time at the start for Watson to paint the detective for us, in the second novel, *The Sign of the Four*, Doyle shows us how Holmes has already grown with Watson. Let's return to the two "The Science of Deduction" chapters. In the chapter in *A Study in Scarlet*, Holmes uses his science to deduce that a man visiting their apartment was a retired sergeant in the Marines, and there the chapter ends. In the chapter in *The Sign of the Four*, Holmes focuses on Watson's newly inherited pocket watch to accurately recount what Lawrence Frank calls "a life of dissipation and degradation that ends in an ignominious death" (Frank 141-42). In his chapter "Sherlock Holmes and 'The Book of Life,'" Frank calls attention to this scene as an example of Holmes's intellectual growth. Putting the deduction next to Holmes's fondness for Winwood Reade's *The Martyrdom of Man*, Frank argues that, by this adventure, Holmes is growing beyond Watson's little list into a Reade-like polymath, the sort of renaissance man prized in the late nineteenth century who "had emerged out of the various challenges to the Higher Criticism, Deism, and Natural Theology summarized by Reade" (Frank 141). What is remarkable for our purposes is not merely that Holmes has grown intellectually; rather, it is the emotional nature of the scene. The degraded deceased from whom Watson has inherited the watch is in fact his brother. Watson is doubly upset, first to hear his brother's story in such matter-of-fact fashion, and second because he believes no one could have gotten such accurate information without prying into his personal life. In response, Holmes must not only explain his processes but also do so with an apology for his bluntness, for his failure to take Watson's feelings into account when he turned the doctor's personal tragedy into simply an "abstract problem" (41-42).

That apology itself is not exactly profuse with feeling. However, this scene coupled with Frank's analysis demonstrates two important things for us about Holmes: First, Holmes wants to

be good to Watson; Holmes is a valuable ally and a caring friend, and he wants Watson to know that. Holmes wants Watson to know that he is more to him than an abstract problem. That is a remarkable statement from a man who has designed and built his life around finding and solving puzzles. Second, Watson is good for Holmes. He is a cause for Holmes to be a friend and ally to another person. Watson is a reminder for Holmes, a way to help Holmes see people as more than abstract problems. That is integral to Holmes's work and so to everyone's benefit.

And this relationship continues to deepen all the way to the last collection of stories, *The Case-Book of Sherlock Holmes*. In the conclusion to "The Three Garridebs," Holmes and Watson are lying in wait to catch a murderer and, upon being caught, the man shoots Watson. Holmes immediately bludgeons the shooter with his own pistol and is soon holding Watson in his arms, bringing him to a chair. "You're not hurt, Watson? For God's sake, say that you are not hurt!" For the villain, it was a near death sentence; Holmes tells him that "if you had killed Watson, you would not have got out of this room alive" (450). For Watson, it is the summit of their relationship.

It was worth a wound—it was worth many wounds—to know the depth of loyalty and love which lay behind that cold mask. The clear, hard eyes were dimmed for a moment, and the firm lips were shaking. For the one and only time I caught a glimpse of a great heart as well as of a great brain. All my years of humble but single-minded service culminated in that moment of revelation. (450)

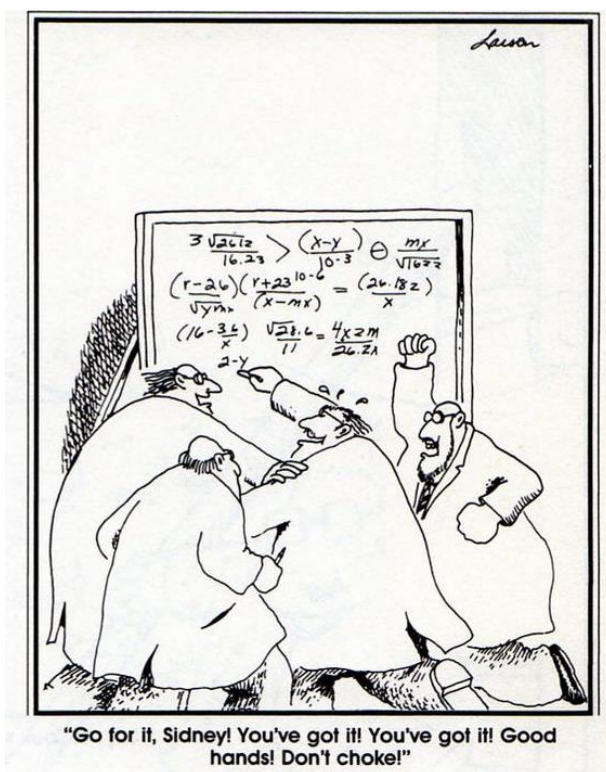
By this final round of stories, Holmes's relationship with Watson has come to inspire in him, particularly compared to early Holmes, a shocking level of feeling. Holmes is past just being connected with humanity and has, through Watson, become humanized.

The Benefits of Collaboration

Holmes is a successful hazardous scientist because he found a way, not just to be a stabilizing figure, but also to do so while utilizing elements of instability—elements like street urchins, incompetent police, and a homeless soldier recently returned from Afghanistan. Holmes does not just patrol the fringes of society; he helps to set them in a way that benefits the rest of London and the rest of Britain while cementing himself into that increasingly functional system. Van Helsing does much the same through his creation of social networks in and outside of the country, and this is precisely the task at which Jekyll and Moreau fail. It is an issue not of madness but of maladaptiveness.

Adaptation is what we need now. Together, these works argue that the key to avoiding the threat of mad science is in connecting with the hazardous scientist, appreciating them, encouraging them to reach out as well, and then finding a way to adapt to each other. This is what we must do. With Jekyll and Moreau this process is frustrated by systemic failures as well as personal failures, primarily by a failure to connect. Neither Jekyll nor his friends can breach the walls of decorum and modesty that separate them. Moreau is educated in and then ostracized by a social and academic system that lacks the more formal structures for outreach and engagement, and at the end we have three men of science on an island who all share the flaws of that same system. Because of the narrative structure of these works, we see much of this failure in hindsight, in the memories of Jekyll and Moreau, but we do see the connections and networks form in Holmes and with Van Helsing in *Dracula*. These stories show us how, through communication, intellectual exchange, and bonds of trust and interdependence, we can address our problems scientifically and as a community. Since the Victorian era, science fiction has continued to explore the way to socially incorporate science and scientists. This is fortunate, as we have never had a greater need to engage with science.

CODA: UNCLE SCIENCE OFFICER AND THE SISTER SCIENTIST



I began this dissertation at a time when anti-intellectualism and science denial seemed on the rise, particularly in America. Even aside from the increasingly present threat of global warming, there seemed to be no end to public scientific controversy in the news and in my students' papers: the validity of restrictions on abortion care, the efficacy of addiction services, stem-cell research, GMO vs. organic crops. These controversies felt, and still do to varying degrees, quite immediate. There are specific ideological differences at work, but a general hostility to science has played a major role in how we discuss and legislate these matters. I thought that perhaps I could do something there. It seemed to me a good time to reconsider some of the still influential works featuring scientists and anti-science sentiment from the era that did so much to fashion both. I hoped that some potentially useful insights could be gleaned from reconsidering the mad scientist trope that is still so much a feature of criticism of science and of science denial. That was a few years ago.

I am finishing this dissertation during a pandemic, one that has, as of June 4, 2020, already killed over 110,000 Americans, according to the latest reports from the WHO

(“Coronavirus”). That’s 110,000 people in less than five months. 110,000 in this country, where anti-science sentiment is so strong, out of around 383,000 worldwide. We have less than 5% of the population and close to 30% of the deaths from COVID-19. In the midst of this death, our president is discouraging people from following the advice of epidemiologists and questioning the reports of medical professionals treating patients. The politicization of science and the anti-intellectual and anti-science mentality so prevalent in not just one party but in the country as a whole has been a major factor in growing our crisis to this size.

We are now in the eye of this storm, anticipating a potential second wave, one that may be significantly deadlier than the first. Many things that seemed important less than half a year ago seem much less so today. Other problems that felt immediate now feel desperately urgent. Addressing our current anti-science sentiment is critical, and I believe that understanding the development of our portrayal of scientists and their place in society can be important to that task.

If there is a single theme that binds our time with the close of the nineteenth century, it is anxiety—and specifically, science anxiety. Anxiety as a theme of the *fin de siècle* has become something of a cliché to be avoided, though it is quite difficult to do so with speculative and science fiction. So much of the genre is about impending change and the contemplation of an unknown future. Even optimistic speculative fiction almost necessarily incorporates an undercurrent of anxiety over potential stumbles, and the works featured in this dissertation are no exception. When research continues, as it must, any victory over dangerous experimentation is liable to feel temporary. Meanwhile, the heroic scientists we root for seem both singular and very mortal. Even Holmes gets old. Anxiety needs to be examined, but concern alone is no help. The most significant lesson of these texts is, I argue, that there is an answer to this anxiety, a productive one: cooperation.

One of my claims in this dissertation is that this subgenre creates models for scientists and engagement with scientists. Characters such as Benjulia, Jekyll & Hyde, and Moreau are dissected not merely as monsters but outcomes of systemic failures, products of inadequate social networking and support. Likewise, characters like Holmes and Van Helsing, dangerous scientists who negotiate a symbiotic relationship with society, are held up as hopes for the future. The aloof and socially isolated mad scientist was best countered with the help of the eccentric consulting scientist. This model, all of these models, has certainly been influential in the years

since the boom in mad scientist stories at the close of the nineteenth century. Over the past century, we have developed some new characters to showcase and encourage this cooperation.

In this coda, I would like to discuss some of these models, the ones I consider to be the most common and influential. There are far too many of each to catalog them all in this brief coda, but I will name some I find to be typical and useful examples. The first of these types of figures I wish to discuss is one that has gained some popularity over the twentieth century as a form of this cooperation: the often somewhat mentally askew, avuncular consulting scientist, a sort of uncle science officer.

Uncle Science Officer, the Avuncular Scientist

The avuncular scientist, like Holmes but especially Van Helsing, combines something of the dedication to science and the sometimes unsettling or destabilizing nature of science—characterized by the brilliance, abnormality, monomania, and even some of the disinterested amorality of the mad/hazardous scientist—with relationships with individuals and a general care for humanity. Characters like Dr. Doolittle; Caractacus Pott of *Chitty-Chitty-Bang-Bang* (1964, Potts in the 1968 film); and Professor Ned Brainard, the titular *Absent-Minded Professor* (1961), shepherd and educate while also displaying a certain instability and recklessness, even monomania, that recalls the Victorian mad scientist. This character has become a regular figure in children's and YA science fiction but is popular beyond that genre. Doc Brown of *Back to the Future* (1985) and its sequels is a catalyst for the adventure through his mad science and is also an avuncular companion and even eventually a sort of life coach for Marty, the hero of the films. Some of the most influential popular culture of the past century, including characters that reappear time and again, has come out of this mold, and often these characters protect against bad science. In Marvel comics and movies, Dr. Abraham Erskine makes the serum that transforms young Steve Rogers into Captain America. Erskine is often drawn to resemble Albert Einstein, who became America's long-standing, real-life avuncular scientist. Erskine's role is generally to befriend Steve, make a speech, and then get shot directly after Steve's transformation. He makes his strike against the Nazis who had misused his work to create their own super soldier, and then he dies. There are avuncular scientists who are more successful, or at least longer lived.

The avuncular scientist attains freedom to work and study in exchange for their counsel to the protagonist, who generally has some position of authority or at least narrative centrality. Perhaps the two chief figures in this vein, both products of the 1960s that continue to feature in current media, have been the Doctor of *Doctor Who*, with their ever-shifting rota of young companions, and *Star Trek*'s Spock, the unification of scientific advisor and second in command. Companion and second in command are both key here. Of course, both of these characters are powerful in their own right, but crucial to their appeal is that they do not generally, or for long periods of time, take control. Like Van Helsing, they are chief scientific advisors. Spock is there in large part to assist Kirk, and in return he is positioned on the front lines of discovery. The Doctor's fit involves a little more abstraction than Spock's. The Doctor goes on many adventures beyond Earth and is a protagonist in their own right; however, even abroad, the Doctor's function is often to help humanity continue on its way, and they always return to help preserve Britain. The avuncular scientist need not be an incidental peripheral, like, say, James Bond's Q. Nevertheless, it is important that they do not seek power for themselves. Instead, the position allows the character to at times be focused on science first, and that can be shown as a positive attribute. The avuncular scientist digs back to archetypes from before Faust, all the way to Merlin. Like Merlin, the avuncular scientist serves, perhaps even mentors, but ultimately relinquishes control to the more normative hero. As a corollary, for the scientist this also affords a position from which they can advocate for science, science education, and a scientific perspective.

Right now, in the real world, we have Dr. Fauci. Somehow, in the middle of the absolute mess of the American response to the pandemic, one preceded by cuts to the CDC and now featuring cuts to the WHO, Dr. Anthony Stephen Fauci has not only retained his job as director of the National Institute of Allergy and Infectious Diseases but has been put forth as an expert by the Trump administration and has become generally respected at least across the majority of the political left and center. He has managed thus far to strike a difficult balance among duty and utility to a famously erratic and temperamental boss with a cult-like following among a third of the nation, a duty to science, and a duty to the public. He is able to do this in part because of his professional bona fides and history and in part because he is largely seen as a figure of science who has no interest in political power or building a political power base. Dr. Fauci avoids

making statements that are outside his area of expertise or could be construed as attempting to sway anyone's political stance.

Dr. Fauci has managed to become not Trump's uncle science officer but the nation's. However, this very balancing act points to problems inherent in the avuncular model and its relationship to authority. First, commensurate with the parallel of the court wizard, the avuncular scientist is essentially a kind of grand vizier. This is possibly the most suspect political rank in all of history as well as fiction. On the other side, there is a danger of being seen as—or becoming—a tool of an unjust authority, a use to which science and scientists are often put in dystopic fiction.

The Heroic Scientist

The other figure, the heroic scientist, built more on Holmes, is still a way to avoid these pitfalls. I mentioned Batman in relation to Sherlock Holmes, and there are several other pop culture examples of heroic scientists, many coming from the world of comics. Iron Man, Ant-Man, the Hulk, and Mr. Fantastic are just a few. Some of these are super-powered, and many come from the model of Doc Savage, the scientist and “Man of Bronze” from early twentieth-century pulp novels. A hefty percentage of science fiction novels and films from the past thirty or forty years feature heroic scientists; some are even protagonists, as they are in *Jurassic Park* (1990, and the film in 1993), in which the industrialist is the mad one, and *Ghostbusters* (1984).

The heroic scientist has its own problems as a useful trope. For the most part, they cannot be so dedicated to the scientific impulse or worldview. The avuncular scientist can be more concerned with science, but the heroic scientist must generally focus on a mission that is less likely to be purely scientific in nature, and they are less likely to make science their priority. Iron Man, Hulk, and their ilk are always heroes first. There are also problems inherent in any image of the hero as a model. Real-world analogues are more difficult to spot and less splashy when they appear, and the consequences for performing the role poorly, with accompanying hubris, can be disastrous.

This is not to say that there are no real-life heroic scientists. The recent incarnation of the *Cosmos* television series made a point of highlighting several real-life scientists whom one could

term heroic. Among them, Clair Cameron Patterson stands out.²⁹ While researching the earth, Patterson discovered worldwide industrial lead contamination, primarily gasoline. Patterson campaigned against lead poisoning for decades and in the process endured years of professional ostracism from scientists, particularly biologists, whose work his own had upset as well as public ridicule, some of it arranged by the petroleum industry. We know now it is quite likely that without such insistent efforts, we as a species would be poisoned past the point of brain damage. On the other hand, we have Elon Musk.

If Patterson is an example of a real heroic scientist, Elon Musk is a poster child for the unwarranted admiration that is a risk inherent in any version of the hero. Musk attained a special place in geek culture and progressivism and no small amount of hero worship for his involvement with Tesla and SolarCity and for founding SpaceX. Over the past few years, Musk has also become known for the unsafe conditions in his factory (Ohnsman, Wong) and, most recently, for what is generously called COVID-19 “skepticism” (Koren). Musk inaccurately predicted the virus would pass by the end of April (Koren), criticized stay-at-home orders as “fascist” (Domonoske), and eventually opened the Tesla factory in Fremont in the San Francisco Bay Area early in violation of the law (Jones).

I would argue that we do not need a perfect model for fictional scientists, but rather a plurality. Clearly, the heroic scientist and the avuncular scientist both have their utility in fiction, or even in real life. However, there are enough issues with both that more models are called for. For instance, there is the rampant sexism.

The Matertal and the Heroic Woman Scientist

In our pop culture as well as in the real world, we still generally imagine our scientists to be men. According to the AAUW, women still make up 28% of the STEM workforce and are vastly outnumbered by men in most STEM fields in college (“Stem Gap”). A report from the Geena Davis Institute on Gender in Media and the Lyda Hill Foundation, which included their own research and drew on work done by others, analyzed STEM characters in film and television and found that men outnumbered women 62.9 to 37.1%. In addition, non-white characters were only 28.8% of the total (“Portray Her” 3). This is a slight step up from previous years; a 2003

²⁹ See Lydia Denworth’s *Toxic Truth* (2009).

survey by sociologist Eva Flicker of sixty films from 1929–2003 featuring scientists found that only 18% included female scientists (Flicker 1).

There are, of course, women mad scientists in the literature, just as there have been many women scientists who have made major contributions. In both cases, their influence has often been hampered by sexist patriarchal norms. In an article for *Gizmodo*, author and librarian Jess Nevins, author of the *Encyclopedia of Fantastic Victoriana* (2005), writes of four Victorian works featuring three women mad scientists. George Griffith's *The Angel of the Revolution* (1893) and its sequel *Olga Romanoff* (1894) feature a female mad scientist bent on world domination. T. Mullet Ellis's *Zalma* (1895) also stars an eponymous female mad scientist and villain. L. T. Meade (Elizabeth Thomasina Meade Smith) wrote *The Brotherhood of the Seven Kings* (1899) with Robert Eustace featuring another villainous woman of science, this time Italian. These works were not included in the body of this study, in part because the scientists in them were bent on political ends rather than scientific ones, but also because their cultural footprints were smaller. These are the three most known examples I have seen of women mad scientists in Victorian literature, and only one has a female author. To give a sense of how obscure *Brotherhood of the Seven Kings* has become, a JSTOR search for the title found six articles, one of which was a 1980 article from *Science Fiction Studies* arguing that the book, along with seventy-three others (five total by Meade), should be excluded from science fiction bibliographies on the grounds that it was not really science fiction (Suvin 210).

Despite this, there have been some literary examples of women avuncular, or materteral, scientists. Ward Moore's *Bring the Jubilee* (1953), which Nevins also mentions, has the brilliant Barbara Haggerwells. Haggerwells is not exactly a mentor figure; at one point she has a romantic relationship with and the protagonist, Hodge Backmaker, but she is brilliant, abnormal, and at least somewhat monomaniacal and amoral, and, like Doc Brown, she causes the protagonist to go back in time in order to make sure things go "right." In an alternate 1953 in which the Confederacy has successfully established itself as an independent nation, Haggerwells convinces Backmaker, a historian, to travel back in time to the Battle of Gettysburg. He does and accidentally causes the South to lose the battle and the war. As a consequence, Haggerwells and time travel no longer exist, stranding Backmaker. As with Doc Brown in *Back to the Future*, it is suggested at the conclusion of the novel that Haggerwells manipulated events and the protagonist (Moore 167, 184)—though, in this case, rather than self-preservation or saving a friend, the

scientist sacrifices herself and her companion, or at least his future, for a better world. There have certainly been women mad scientists since, though their number has remained dwarfed by the men.

Young children's literature and electronic media has also had some noted maternal scientists. The most known of these are probably Miss and now Ms. Frizzle of the *Magic School Bus* books and television series. The Frizzles are particularly focused on science education, though there are also social and moral lessons. Like the Doctor, the Frizzles have some commonalities with previous wizards. In particular, it is not hard to imagine a literary family tree that includes Mary Poppins or Miss Eglantine Price of *Bedknobs and Broomsticks* (1971, based on novels published in 1943 and 1947). The Doctor, too, is a woman these days. A few years after the Master, the Doctor's archrival and a much madder scientist, became the Mistress or Missy, the Doctor herself regenerated as a woman, and we have now had two seasons with Jodie Whitaker as the titular Doctor.³⁰ Whitaker's time has been marked by a larger number of companions, whom she often refers to as "fam."

There have also been a few, though too few, heroic female scientists. I mentioned *Jurassic Park* earlier. Dr. Ellie Sattler is not involved in the creation of the park, but she does use her scientific expertise and also performs multiple heroic acts that enable the protagonists to escape the island.³¹ I also mentioned *Ghostbusters*. The original *Ghostbusters* were perhaps the most popular heroic scientists for my generation, and now we have a group of women *Ghostbusters*, also featuring three scientists. The sexism in the reception of that film was disheartening. Still, the past few decades have had several films and television series with heroic women scientists: Dana Scully, Temperance Brennan, *Bones*, Dr. Arroway of Carl Sagan's *Contact* (1985 book, 1997 film), and Jane Foster of the MCU, who is about to get her own movie. All these women characters have had science advocacy not just as a character trait but as a trait crucial to their character arcs and the narrative arcs of the stories in which they are protagonists. Beyond these models, there is also a scientist figure with a distinctly feminine nature, or at least one with a history and presence that runs counter to toxic masculinity.

³⁰ She is fantastic.

³¹ She also does not get stuck with the kids, though in the film she is attempting to convince Dr. Grant to consider starting a family together.

The Sister Scientist

Another model recently gaining ground has been the sister scientist. To some extent Dana Scully and also Willow from *Buffy: The Vampire Slayer* fit this model. 2016's *Ghostbusters* reboot also edges into this category. The original film was not a particularly shining example of science advocacy. The most central character, Peter Venkman, is a scientific fraud. In his introductory scene, he is tampering with the results of his own ESP experiment in order to seduce a female participant in the study. When the scientists in the original film form the Ghostbusters, it is for the express purpose of making money. In contrast, the collaboration of main characters of the 2016 film are motivated primarily by the thrill of discovery. It is footage of Erin Gilbert's (Kristen Wiig) joy at discovering proof of the supernatural that gets her fired from her academic position, spurring the formation of the Ghostbusters. Again, it is a pity that there will be no sequel.

In children's entertainment, the most recent standout example of this model is Entrapta from Netflix's *She-Ra and the Princesses of Power* (2018–2020). With Entrapta, Noelle Stevenson and the other writers of the new series took a minor villain from the original series and grew her into a complex, and certainly hazardous, scientist and one of the show's main characters. Entrapta possesses all four of the qualities of the typical mad scientist, which is part of the reason she spends time working for both sides; her interest is in science and technology. However, she finds a permanent place among the other protagonists when they tell her that they care for her, value her as a teammate, and that they will facilitate her work. In the context of the episode in question, "Destiny Part 1," convincing her of this saves her and several other characters' lives. Entrapta becomes not just a science advisor but a full member of a team. The princesses, despite the noble title, having a queen, and having another primary protagonist in She-Ra, form a shockingly egalitarian community of protagonists that grows more democratic as the series progresses. This community stands in contrast to the consistent military hierarchy of properties like *Star Trek* as well as elements of toxic masculinity that so often creep into brotherhoods of protagonists that include scientist characters.³²

³² It may be going too far to say that *She-Ra*'s Etheria is reaching to capture something of the feminine utopias of Margaret Cavendish's *The Blazing World* (1666) or Charlotte Perkins Gilman's Herland novels of the 1910s, but I would be curious to hear Noelle Stevenson's thoughts on those works, particularly Cavendish's.

This is not, of course, an end. The problem is not just patriarchy; it is white supremacy, heteronormativity, cisnormativity, ableism. Inclusivity is one of *She-Ra*'s strengths, and Stevenson has confirmed that Entrapta was written as being on the autism spectrum with input from a crew member who is on the spectrum. Still, representation is a problem across the board. The 2016 *Ghostbusters*, like the earlier film, wrote its only non-white protagonist as the only blue-collar, non-scientist character. There are also issues with representation through the avuncular/maternal scientist model. A less central character offers a way to sideline non-male, non-white, queer, and trans characters by keeping them in the lab and away from the protagonist's spotlight. The results can be scientific versions of the magical black man, the manic pixie dream girl, the gay best friend, and other utility players. I believe the sister scientist, sibling scientist of any gender, offers a way out of this trap. The sister scientist and the more egalitarian framework that enables her is a model that maximizes opportunities for networking with scientists and the formation of relationships of mutual affection and respect. Whatever models we employ, these relationships are precisely what we need in and outside of our fiction.

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