

**ENGAGING THE UNKNOWABLE: MODERNISM, SCIENCE, AND  
EPISTEMOLOGY**

by

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**A Dissertation**

*Submitted to the Faculty of Purdue University*

*In Partial Fulfillment of the Requirements for the degree of*

**Doctor of Philosophy**



Department of English

West Lafayette, Indiana

August 2019

**THE PURDUE UNIVERSITY GRADUATE SCHOOL**  
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## ABSTRACT

Author: Galat, Joshua, R. PhD

Institution: Purdue University

Degree Received: August 2019

Title: Engaging the Unknowable: Modernism, Science, and Epistemology

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My dissertation is situated at the intersection of modernism, print culture, and early-twentieth-century post-Newtonian physics, namely relativity theory and quantum theory. I investigate the ways in which the emerging concept of the unknowable—loosely defined as that which is beyond knowledge but maintains an influence on what can be known—catalyzed a cultural reorientation away from Victorian notions of positivism and progress and toward those aspects of reality that resist knowledge. Although a great deal of critical attention has been paid to modernism's epistemological uniqueness, scholars are only beginning to acknowledge that concurrent revolutions in physics both reflected and influenced modernists' conceptions of history, subjectivity, and aesthetics. Scholars such as Gillian Beer, Michael Whitworth, and Mark S. Morrisson have demonstrated that print and popular culture provided crucial avenues through which scientific ideas were disseminated in British society. Furthermore, their research has shown that modernist authors not only read popular science material but also published their work alongside articles about science in a variety of magazines, journals, and newspapers. Building on these connections, I show that books and periodicals served as platforms for dialogue and ideological exchange between science and literature as both disciplines increasingly recognized and grappled with the pervasive influence of the unknowable.

## CHAPTER 1. INTRODUCTION

### 1.1 Introduction

Situated at the intersection of modernism, print culture, and early twentieth-century post-Newtonian physics, namely relativity theory and quantum theory, my dissertation investigates the ways in which the emerging concept of the unknowable catalyzed a dramatic cultural reorientation away from Victorian notions of positivism and progress and toward those aspects of reality that resist knowledge. Loosely defined, the unknowable refers to that which in nonclassical theories, like quantum physics, resides beyond the limits of any analysis or form of knowledge but still maintains an influence on what can be known. Although a great deal of critical attention has been paid to modernism's epistemological uniqueness, scholars are only beginning to acknowledge the similarities and interactions between the movement and concurrent revolutions in physics. Scholars such as Gillian Beer, Michael Whitworth, and Mark S. Morrisson, among others, have demonstrated that print and popular culture provided crucial avenues through which scientific ideas were disseminated throughout British society.<sup>1</sup> Furthermore, their research has shown that modernist authors not only read popular accounts of scientific discoveries and practices but also published their work alongside articles about science in a variety of magazines, journals, and newspapers. Building on this body of scholarship, I argue that books and periodicals served as platforms for dialogue and ideological exchange between science and literature as both disciplines increasingly recognized and grappled with the pervasive influence of the unknowable. Rather than simply reacting to science, modernist authors

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<sup>1</sup> See Beer's *Darwin's Plots*, *Open Fields*, and *Virginia Woolf*; Whitworth's *Einstein's Wake*; and Morrisson's *Modern Alchemy* and *Modernism, Science, and Technology*. For additional sources that explore modernism and science with less of an emphasis on physics and print culture, see Armstrong, Canaday, Walter, Avery, Duffy, and Clarke and Henderson (editors). Additional sources about modernism and science more immediately relevant to this study are cited throughout this introduction.

anticipated certain concepts and ideas and allowed popular expositions of science to coalesce with their preexisting views of aesthetics, subjectivity, and history.

During the Victorian era, scientific thought was primarily a continuation of the Enlightenment perception of the world and human experience that emphasized the power of the human intellect to observe, analyze, and comprehend reality as an ever-expanding domain of knowledge. This epistemological trajectory is defined by the assumption that humanity can know the unknown and therefore should strive to do so. This process was mirrored in the work of the material realists, who shaped their narratives to perform the scientific process and thereby exploit the popular interest in science and the cultural confidence in scientific empiricism. Around the end of the nineteenth century, however, the Enlightenment coming-to-know narrative was radically disrupted when important developments in physics and drastic experimentation in literature indicated that the nature of knowledge needed to be reevaluated to accommodate new understandings of what could and could not be known. In the physical sciences, a rapid succession of revolutionary discoveries in the first three decades of the twentieth century produced Einstein's theories of relativity and quantum mechanics. These ideas rejected the uncritical empiricism that dominated physics during the centuries before in favor of a new paradigm of thought that acknowledged the relative nature of reality and accepted that certain aspects of its fabric were fundamentally unknowable. As scientists began changing their language to account for their shifting views of knowledge, literary modernists were simultaneously distancing themselves from the narrative laws and traditions of material realism and exploring unique models of poetry and fiction to fashion a realism of the mind that could more accurately represent their views of thought and subjectivity. By examining important books, periodicals, and editorial policies within the context of these epistemological revolutions,



I contend that print culture provided a shared medium through which scientists and authors could explore the limits of knowledge and adapt their respective crafts accordingly to better express the uncertainty and instability intrinsic to modern life and experience.

## 1.2 The Two Cultures

By employing a highly interdisciplinary approach to modernism, I aim to use this dissertation to continue bridging the gap between the sciences and humanities and further demonstrate the interrelatedness of disciplines historically separated in university systems. In C. P. Snow's famous 1959 lecture, "The Two Cultures," he argued that the sciences and humanities had retreated from collaboration with one another and were adopting increasingly antagonistic positions toward the opposing worldview. As he described, "Literary intellectuals at one pole—at the other scientists, and as the most representative, the physical scientists. Between the two a gulf of mutual incomprehension—sometimes (particularly among the young) hostility and dislike, but most of all lack of understanding" (4). Especially since the beginning of the twentieth century, Snow claimed, the two domains had been drifting apart until they reached a point of mutual exclusivity, a situation that damaged the efficacy and productivity of both. According to him, "The clashing point of two subjects, two disciplines, two cultures . . . ought to produce creative chances. In the history of mental activity that has been where some of the breakthroughs came. The chances are there now. But they are there, as it were, in a vacuum, because those in the two cultures can't talk to each other" (17). The lack of communication and interaction between the sciences and humanities only worsened during the decades following Snow's lecture as postmodern philosophers, much to the dismay of an outspoken group of scientists, began appropriating mathematics and science to expound various aspects of their conceptual thinking. Irritated with what they saw as a gross misuse of their discipline, scientific realists fought back,

most notably through the publication of physicist Alan Sokal's 1996 hoax article in a humanities journal, a publication that "proved" postmodernists had a limited understanding of science, and the subsequent "Science Wars" of the late 1990s.<sup>2</sup>

Responding to Snow's argument and its aftermath, my research is part of a wave of recent scholarship formulating interdisciplinary approaches to literature to illuminate the historical associations and shared influences between the sciences and humanities. A significant contributor to this effort has emerged in the form of new modernist studies, which was born around 1999 with the establishment of the Modernist Studies Association (MSA). According to Douglas Mao and Rebecca L. Walkowitz, new modernist studies strives to expand the traditional scope of modernist scholarship and thereby better account for unacknowledged social, cultural, and political factors that affected modernist thought and literature (737-38). As such, it builds on Gillian Beer's notion of cultural encounter, an event that "occurs not only between peoples of different ethnic origins but between trades, genders, professional groups, specializations of all sorts in a society" (*Open Fields* 1). Beer describes that each member of society simultaneously occupies unique positions that intersect with history, materiality, mass culture, and community. "These multiple subject positions," she explains, "mean that relations never form a single system: what may be perceived as outcrops or loose ends may prove to be part of the tracery of other connections" (1). When modernism is approached as an intricate network of cultural encounters, new avenues for understanding the movement may be traced to reveal previously unnoticed, or perhaps simply underappreciated, cultural and interdisciplinary forces that shaped modernist aesthetics and the social context in which the movement unfolded.

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<sup>2</sup> For additional research on Snow's "two culture" argument and its aftermath, see Plotnitsky and Ortolano.

As scholars have worked to uncover the cultural encounters implicating modernism, an increasing amount of attention has been paid to the roles of science and mass culture in conditioning the general spirit of the times. As Jonathan Crary notes, “Any effective account of modern culture must confront the ways in which modernism, rather than being a reaction against or transcendence of processes of scientific and economic rationalization, is inseparable from them” (85). Indeed, Ann Ardis argues that monumental works like Andreas Huyssen’s *After the Great Divide* (1986) missed the opportunity to glean the respective contributions of science and the rise of mass culture to modernism:

Modernism’s relationship to mass culture is *not* framed in relationship to the pursuit of disciplinary specificity and integrity driving the (re)organization of the human and natural sciences at the turn of the twentieth century. The tendency to treat science as something beyond the pale, outside the cultural critic’s horizon of interests is . . . one of the most unfortunate legacies of the Frankfurt School in Huyssen’s work. (6)

For scholars such as Sara Danius, science and modernism are jointly responsible for the advent of mass culture through their relationships with new technologies in the early twentieth century. She contends that “a certain logic of technologization is inherent in high-modernist aesthetics,” which signals “that the innovations of modernism are situated in the same field of socioeconomic process and technoscientific transformations that made mass culture possible” (7). In addition to the historical, socio-cultural, and aesthetic implications of examining the interplay of science, literature, and print culture, Lee Oser observes that the application of science in society, including its effects on literature, raises important ethical concerns for modernism as well: “The modernist moral project . . . fuses nature and art—ethics and aesthetics—into a technology of the

void, a cosmic process that forgets humankind” (120). To approach modernism as an isolated affair, then, is to see only a small portion of the much larger web of cultural associations in which it was situated and reduce the movement to a static monolith removed from its significance for humanity.

### 1.3 Literature and Science During the Victorian Era

The groundwork for the cultural encounters that occurred during the late nineteenth and early twentieth centuries was laid during the Victorian era when the fates of science and literature were wedded to one another. Although Snow’s claim about the disparity between the sciences and humanities may have been true in the 1950s, history demonstrates that such a situation was not always the case. As George Levine explains in his introduction to *One Culture: Essays in Literature and Science*, “It is possible and fruitful to understand how literature and science are mutually shaped by their participation at large—in the intellectual, moral, aesthetic, social, economic, and political communities which both generate and take their shape from them” (5-6). In the early nineteenth century, as the word “science” began acquiring its modern meaning as the study of the physical world, science had yet to largely acquire financial support from universities and the government, with the notable exception of the British Royal Society, so scientists were primarily independently wealthy scholars with enough leisure time to indulge their curiosities.

To generate public interest in their work, Victorian scientists had to communicate their ideas through various print mediums, rather than strictly through the face-to-face demonstrations of the centuries before, in a language that was both appealing to and could be easily understood by non-scientific audiences. Beer argues that this obstacle was easily surmountable because “scientists still shared a common language with other educated readers and writers of the time” (*Darwin’s Plot* 4). Additionally, they often incorporated literary allusions—most commonly

Shakespeare, Milton, and Wordsworth—and employed the use of literary tropes to make scientific material comfortable for their audiences. According to Beer, the writing of scientists such as Charles Lyell, Edmund Spencer, Charles Darwin, T. H. Huxley, John Tyndall, W. K. Clifford, and the early James Clerk Maxwell “could be read very much as literary texts,” thereby making scientific writing a dialogic affair: “In the nineteenth century . . . it was possible for a reader to turn to the primary works of scientists as they appeared, and to respond directly to the arguments advanced. Moreover, scientists themselves in their texts drew openly upon literary, historical and philosophical material as part of their arguments” (5). Victorian scientists found in literature a means of legitimating their work in the eyes of the public, while also ensuring its sales and a steady stream of funding for future research.<sup>3</sup>

The Enlightenment narrative operative in science during the nineteenth century engendered a remarkable faith in European society that humankind could steadily make the entirety of reality known. Frenchman Émile Zola, for example, predicted in “Naturalism on the Stage” (1880):

We shall enter upon a century in which man, grown more powerful will make use of nature and will utilize its laws to produce upon the earth the greatest possible amount of justice and freedom. There is no nobler, higher, grander end. Here is our role as intelligent beings to penetrate to the wherefore of things, to become superior to these things, and to reduce them to a condition of subservient machinery. (170)

Similarly, Englishman James George Frazer claims in an early volume of *The Golden Bough* (1890-1915), “Every great advance in knowledge has extended the sphere of order and

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<sup>3</sup> Further key works addressing the topic of science’s use of literature and literary tropes in the Victorian era and throughout history include Holton, Smith, Clarke, and Clarke and Henderson (editors).

correspondingly restricted the sphere of apparent disorder in the world, till now we are ready to anticipate that even in the regions where chance and confusion appear still to reign, a fuller knowledge would everywhere reduce the seeming chaos to cosmos” (35). These quotes are only a small sampling of evidence that indicates the growing confidence in the power of human intellect and its application to the world through scientific research that spread throughout European society during the nineteenth century.

Victorian science and its proliferation throughout society perpetuated the Enlightenment way of thinking about the world, which glorified the application of the human intellect to its surrounding environment to transform the unknown into the empirically known. As opposed to the revolutionary science that would begin emerging around the 1850s with Darwin’s theory of evolution, the formulation of thermodynamics and its laws, and Maxwell’s work with electromagnetism, scientists of the first decades of the nineteenth century embraced a linear model of gradual scientific discovery and change to build on already-established theories and ideas. The dialogic relationship that science shared with literature caused early nineteenth-century authors to begin emulating the scientific process of research and discovery to lend their writings shades of realism. Indeed, what science gained from literature during the Victorian era it gave back in the form of tools that authors use to make their works more accurate reflections of material reality and therefore more appealing to audiences looking for serious reading. Over time, this dynamic helped contribute to the transition from Romanticism to literary realism during the nineteenth century. As novelists detected the growing social appreciation for, and even obsession with, science, they began formulating approaches to plot and character development that mirrored scientific empiricism. According to Laura Otis, the role of imagination, though consistently important to any creative endeavor, was diminished as romantic

writing “increasingly gave way to realistic and naturalistic narratives, in which the story-teller shared many goals with medical and scientific experts” (xxiii).<sup>4</sup>

Although they maintained discursive differences from scientific writers, producing unique styles that synthesized their personal imaginations with consciously and unconsciously acquired scientific influences, mid- to late nineteenth century authors began orienting their compositional efforts toward writing narratives that dealt with the search for origins, especially after Darwin, or, what amounts to something similar, discovering the knowable truth of a given character, situation, or social condition. Furthermore, Otis notes that “literary writers . . . gained credibility by incorporating the voices of scientists” and “consciously imitated scientists’ styles and use of evidence, exploiting their own writing techniques to play with scientists’ ideas and encourage readers to rethink them” (xxiv). Over the last decade or so, a fruitful body of scholarship has emerged to support the conclusion that science and the novel matured alongside one another during the nineteenth century, developing in the process a reciprocal relationship that mutually benefited both.<sup>5</sup> The common social denominator of these changes was a growing audience of interested readers who could acquire scientific and literary texts due to the increasing efficiency of publishing, decreasing cost of materials, and more wide-spread availability of printed works. Confidence in the applicability and reliability of the Enlightenment narrative of coming to know thus permeated science, literature, and society to set the stage for the drastic cultural revolution that would begin at the end of the century.

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<sup>4</sup> See Rothfield for additional research on Victorian literature and medical realism.

<sup>5</sup> In addition to sources already cited, see Henkins, Cosslett, Richter, Levine *Darwin and the Novelists*, and Choi.

#### 1.4 Post-Newtonian Revolutions and the Unknowable

The scientific and literary assimilation of the unknown into the growing field of that which was known occurred within and was expressed through the framework and language of classical thought, which, in the case of physics, was represented by Newtonian mechanics. While scientific thinking generally and physics particularly were bound by these laws in the nineteenth century, material realists of the same era were likewise bound by the traditional laws of their craft. As Virginia Woolf decries them in her essay “Modern Fiction” (1919), “The writer seems constrained, not by his own free will but by some powerful and unscrupulous tyrant who has him in thrall . . .” (8). Both science and literature, however, entered new epistemological paradigms around the turn of the century that required completely different sets of rules to accommodate what was rapidly emerging as a drastically different understanding of knowledge, physical reality, and human experience. This was a time of revolution, as Thomas Kuhn would put it, “when the normal-scientific tradition changes, the scientist’s perception of his environment must be re-educated—in some familiar situations he must learn to see a new gestalt. After he has done so the world of his research will seem, here and there, incommensurable with the one he inhabited before” (112). Although there were scientific revolutions in Kuhn’s sense during the nineteenth century that changed human understanding of reality, they did so from within a preexisting Enlightenment framework of knowledge and were therefore not epistemological revolutions in the sense that relativity theory and quantum theory would be. These later theories demanded a complete reevaluation of knowledge because they revealed that not one, but an infinite number of epistemological frameworks existed—none of which was absolutely “true” or “correct”—in which different sets of laws and principles applied or did not apply. Although quantum mechanics would eventually become a normal science by 1930, the new gestalt of the



early twentieth century was a response to the subversion of knowledge and the concept of the unknowable, which was arrived at rationally through the knowable trajectory of the years before.

Literary modernists were not the only ones “making it new,” to play on Ezra Pound’s famous enjoinder, in *fin de siècle* Europe, as scientists were already involved with unsettling the Victorian scientific paradigms through several key developments, technologies, and discoveries that would have remarkable implications for the following decades. As Mark S. Morrisson observes, “This period was fascinated by invisible energies driven by a mutually reinforcing loop of engineering breakthroughs and scientific interpretations, all shared as part of a rapidly modernizing culture at the turn of the century” (*Modernism* 31). Of notable importance were German physicist Wilhelm Röntgen’s discovery of X-rays in 1895, French physicist Henri Becquerel’s detection of radioactivity in 1896, which led to Marie and Pierre Curie’s discovery of the highly radioactive element radium in 1898, and British physicist J. J. Thomson’s demonstration using cathode rays that showed the existence of electrons in 1897.

In the wake of these discoveries, Einstein’s theories of relativity and quantum mechanics quickly emerged and came to fruition between 1900 and 1927, a period that coincided with the rise of high modernism. Regarding relativity, prior to Einstein’s work, Maxwell, building on Michael Faraday’s research of the early nineteenth century, and Heinrich Hertz predicted and then demonstrated in the late 1880s the propagation of electromagnetic energy in a vacuum. These developments dispelled the classical scientific belief in ether, a theorized medium supposedly required for the propagation of light (still viewed as exclusively a wave), and so threw into question the distinctly Newtonian ether physics. Einstein’s work on relativity was a response to these changes, leading him to publish in 1905 his paper on the Special Theory of Relativity, “On the Electrodynamics of Moving Bodies.” To oversimplify, this paper claims that

physical laws are consistent only within a particular frame of reference and only relative motion is detectable between frames. The most critical implication of this discovery was that the ideals of absolute rest and absolute motion, on which Newton's laws and Newtonian physics are built, were purely imaginary and could only be supposed for the purposes of daily life. Several years later in 1916, Einstein released his General Theory of Relativity that caused an even greater upheaval to classical physics because it demonstrated that gravity affects both time and space. To oversimplify yet again, this theory states that space is curved by gravity, and that the matter generating the gravity tells space how to bend, while space reciprocally tells matter how to move. A consequence of this relationship is that as the force of gravity strengthens, the passage of time within its sphere of influence slows and the curvature of space around the body of matter increases.<sup>6</sup>

Einstein's theories of relativity appeared alongside the development of quantum theory, which rapidly evolved over the course of less than three decades. In 1900, German physicist Max Planck discovered that energy was not emitted, distributed, and absorbed in a continuous stream, as was previously believed, but rather in measurable, discontinuous packets of energy that he called "quanta." Over the next few years, researchers led by New Zealand-born physicist Ernest Rutherford managed to decipher that atoms were composed primarily of empty space, before Rutherford split the atom in 1910. The next year, he published his "solar" model of the atom that positioned negatively charged electrons in orbits around the positively charged nucleus, thereby replacing Thomson's "plum pudding" model. Soon after, Danish physicist Niels Bohr introduced yet another model of the atom in which orbiting electrons could jump from one level to another when the atom absorbed or emitted energy. By 1925, Bohr's model was shown to be insufficient

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<sup>6</sup> For studies on Einstein's rhetoric and cultural influence, see Holton, Balibar, and Friedman and Donley.

and sometimes unworkable, so it was replaced by a new theory known as quantum mechanics, which was discovered independently by Werner Heisenberg and Edwin Schrödinger and developed by Max Born, Pascual Jordan, and Paul Dirac, among others. Astronomer, physicist, and mathematician Arthur Eddington, who would play a vital role in the proliferation of the newly discovered knowledge, summarized the state of quantum mechanics during the 1910s and '20s with the quip that the door to quantum theory should bear a sign reading, “Structural alterations in progress—No admittance except on business” (*Nature* 211).

While Einstein’s theories of relativity, which dispelled the absolutes of rest and motion and revealed the ways in which gravity warps time and space, changed the nature of classical knowledge, the nonclassical concepts of Bohr’s Principle of Complementarity and Heisenberg’s Uncertainty Principle emerged to address the existence and impact of the unknowable. Roughly explained, complementarity refers to the ability of objects to possess complementary properties that cannot all be observed and measured simultaneously. As Arkady Plotnitsky describes, “In quantum theory, in Bohr’s complementarity and related nonclassical interpretations, we cannot ascribe conventional properties (such as ‘position’ and ‘momentum’ of classical mechanics) or any physical properties describing their spatial-temporal behavior to quantum objects qua quantum objects, such as elementary particles, which we now see as the ultimate constituents of matter” (6). In other words, per quantum theory, at the heart of all matter lie particles that are fundamentally unknowable. Heisenberg’s Uncertainty Principle, which states that the exact location and velocity of a particle cannot be known simultaneously, likewise supports this notion. Gavin Parkinson describes the epistemological importance of Heisenberg’s principle:

The implications of Heisenberg’s Uncertainty Principle were vast for both physics and philosophy. If the location and velocity of a particle could not now be

measured with precision, then the epistemology inherited from the Newtonian-Kantian causality—insisting on the universe as a teleological mechanism, the future state of which could in theory be predicted from measurement of the location and velocity of a particle and any outlying conditions—was now obsolete. (34)

Einstein's relativity theories, Bohr's complementarity, and Heisenberg's uncertainty were all confirmed through various experiments and observations and almost universally accepted within the scientific community by 1930. Within only three decades, the entirety of classical scientific thought with its fixation on the knowable nature of all things was overturned, thereby concluding the paradigm shift and the restructuring of the physical sciences into their current state.

The advent of relativity and birth of nonclassical theories like quantum mechanics entailed consequences far beyond the domains of science, physics, and mathematics, placing new demands on what is accepted as knowledge in society. As Plotnitsky argues, "Nonclassical theories change the nature of the unknowable and of the relationships between the knowable and the unknowable, as against classical theories, and, consequently it is what we can know and conceive of that are different in nonclassical theories" (7). Considering the timeframe for the development of relativity and quantum mechanics, especially as they relate to the unknowable, I endeavor to consider them in this dissertation within the context of other sweeping cultural changes of the first half of the twentieth century, specifically the rise of high modernism. Philip Weinstein has already examined several modernist authors, namely, Kafka, Proust, and Faulkner, to argue that "a poetics of knowing cedes to one of unknowing" (4). With a description that easily applies to the research of scientists engaged with post-Newtonian physics, Weinstein explains, "In the place of knowing, there operates a dynamic of shock; in the place of

developmental life-histories, there occur unmastered moments. When space becomes uncanny rather than lawful (no longer open to orientation and ownership), when time loses its negotiability (no longer linear/progressive), things become unfamiliar; the subject immersed in them becomes unfamiliar as well” (2). Though Weinstein focuses on the process of unknowing in modernist fiction, he does not address the concept of the unknowable itself, nor the ways in which it may have catalyzed the defamiliarization of knowledge, but I aim to fill this gap in this dissertation.

### 1.5 Early Twentieth-Century Science and Print Culture

Evidence both directly and indirectly connecting the scientific revolutions of the early twentieth century with the general population and literary modernists may readily be found through an investigation into the print culture of the era.<sup>7</sup> Toward the end of the nineteenth century, science became increasingly professionalized and began to receive university and government funding. Since scientists no longer relied on public interest in their research to receive funding and continue their work (as they did during the Victorian era), early scholars of twentieth-century literature and science tended to assume that scientists retreated from society and engaged exclusively with each other in elite groups of specialists. In his important study *Science for All*:

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<sup>7</sup> An immensely useful collection of scholarship and resources dealing with modernism and print culture has emerged in the last two decades to help enable research into modernism, science, and print. Particularly useful studies include Morrison *The Public Face of Modernism*, Binckes, Bornstein, Reed, Hammill and Hussey, Churchill and McKible (editors), Ardis and Collier (editors), and Brooker and Thacker (editors). The number of digital resources available to study the connectivity of modernism, science, and print culture has also increased in the last few years, offering various combinations of online archives, facsimile reproductions, historical descriptions, and scholarly analyses. The *British Periodicals* database (available through Purdue Libraries) provides a collection of 160 journals and magazines, many of which can be viewed in their original format. The *Blue Mountain Project* (<http://bluemountain.princeton.edu/index.html>) contains scanned copies of a variety of European print sources from 1848 to 1923. The *Modernist Journals Project* ([www.modjourn.org](http://www.modjourn.org)) is a research site that contains page scans of almost seventy periodicals, including important magazines like *The Egoist*, *The English Review*, and *The Little Review*. The *Modern Magazines Project Canada* (<http://modmag.ca/>) likewise provides access to many different magazines and journals.

*The Popularization of Science in Early Twentieth-Century Britain*, Peter J. Bowler describes the continued allure of this view in contemporary scholarship:

It is now widely accepted that the new generation of professional scientists abandoned the role of the public intellectual and the effort to teach ordinary people about science. They were unwilling to learn the trade of the journalist, unwilling to abandon the technical jargon of research to communicate with nonscientists. They were increasingly suspicious of their few colleagues who did try to write at this level. Scientists retreated into their laboratories, content to be passive servants of government and industry, and suspicious of journalists looking for new discoveries to sensationalize. (5)

Although this conclusion may seem logical, Bowler emphatically denies that such was the case in England: “the picture outlined above is a myth that obscures the true level of involvement by professional scientists in the effort to promote public interest in science. There was no shortage of material written by scientists for nonspecialists, and there were many ordinary readers who welcomed the claim that what they were getting was ‘popular’” (7). Though certainly not the case for all scientists, a healthy number of them were interested in making science available to lay audiences and actively strove to put their research and that of their contemporaries into accessible print formats.

The spread of scientific ideas, language, rhetoric, and ways of thinking through print, however, was not limited to England; the United States similarly possessed an audience eager to learn of new developments. Marcel C. LaFollette explains in *Making Science Our Own: Public Images of Science, 1910-1955*:

Descriptions of science were especially vivid in the popular periodicals of early twentieth-century America. Curled up by the fireside, teenagers could learn about the latest exploits of physicists and chemists; their parents could read how research could help win a war or cure disease. Until the rise of television in the late 1950s, mass magazines such as *The Saturday Evening Post* and *Cosmopolitan* were information sources about the world of science that were easily accessible to millions of readers in all parts of the country and from all walks of life. (3)

Bowler's and LaFollette's research provide ample support for the conclusion that science in the early twentieth century was not a secluded affair. Even though scientists no longer required public financial support, they were still engaged with sharing their ideas with society in ways that made them understandable to nonspecialized audiences.

Alongside the scientific developments in relativity and quantum theory, as well as other new discoveries related to astronomy, biology, and paleontology, a wide range of popular science books appeared in England during the first few decades of the twentieth century that were invested in simplifying the complexity of science while also maintaining its professional integrity. A few main texts that were not specifically involved with physics were biologist Julian Huxley's *The Individual in the Animal Kingdom* (1912), H. G. Wells's *The Outline of History* (1919-20) (featured in Woolf's *Between the Acts*), and Huxley and Wells's collaboration *The Science of Life* (1929-30), which essentially summarizes the state of biology in the 1920s. Another popular work designed to improve the quality of science education was biologist J. B. S. Haldane's textbook, *Animal Biology* (1927). Considering post-Newtonian physics' dramatic subversion of classical conceptions of reality, many books popularizing Einstein's relativity, explaining aspects of quantum theory, and discussing new cosmologies were likewise published

in a short span of time. These works include Arthur Eddington's *Space, Time and Gravitation* (1920) and *The Nature of the Physical World* (1928), E. A. Burt's *The Metaphysical Foundations of Modern Physical Science* (1925), J. W. N. Sullivan's *Aspects of Science* (1925), Bertrand Russell's *The ABC of Relativity* (1925), A. N. Whitehead's *Science and the Modern World* (1925), and James Jeans's *The Mysterious Universe* (1930). This list is by no means exhaustive, and several of these figures, especially Eddington and Jeans, published multiple popular science books between 1920 and 1935. According to Bowler, the general audience for these and similar books consisted primarily of curious and engaged members of society with a desire to learn: "They were clerical or skilled manual workers who wanted to improve themselves, and who realized that science now played a major role in the modern world and needed to be included in any program of serious reading" (81). Due to the genre of the popular science book and its eager audiences, scientific thought was disseminated throughout society and continuously generated excitement about the new discoveries.

Recently moving beyond books, contemporary scholarship has begun excavating from the vast array of printed material in the early twentieth century some periodicals that specifically addressed scientific issues and others that would occasionally include articles on science and reviews of popular science books. While popular science books usually targeted more serious readers willing to invest a fair amount of time and money in understanding scientific issues, magazines tended to publish pieces with a more general readership in mind. Periodicals that were either explicitly scientific or published explicitly scientific material included *Nature*, in which H. G. Wells published a piece titled "Popularising Science" in 1894, *Science Progress*, *Discovery*, *Conquest*, which tried to reach a broader audience, *Armchair Science*, *Popular Science Siftings*, *Knowledge*, the satirical magazine *Punch*, *Illustrated London News*, which contained a weekly



science section, and *Tid-Bits*. Although the longevity, readership, and success of these periodicals varied, they all appeared and ran from about 1895-1930. A different type of magazine in which modernists were more directly involved focused on social, political, and aesthetic issues but did not hesitate to include the intermittent science article or review of a science book. Some specific print platforms that contemporary scholars have discussed in conjunction with literary authors and science include *The Nation*, *The Athenaeum*, *The Nation and Athenaeum*, *The Listener*, *The Criterion*, *The New Statesman*, *The Times Literary Supplement*, *Saturday Review*, *The English Review*, *The Egoist*, *The Little Review*, *The New Age*, and *Broom*. Most of these periodicals were directly involved with the modernist movement, often publishing critical and creative material about modernism or written by modernists themselves, and some of them were even edited and run by modernist authors. Articles, editorials, reviews, and cartoons addressing scientific developments and implications were scattered throughout.

Studying print culture to make connections between literary modernism and science can be a difficult process for two reasons. First, the researcher must demonstrate that authors were exposed to scientific ideas either directly through the process of reading about them or indirectly through their general circulation in society. These conclusions may be drawn from analyzing catalogues of authors' personal libraries, examining their interaction with periodicals that published scientific material, investigating the appearance of scientific vocabulary and allusions in their work, and locating references to science-related periodicals and ideas in their letters, journals, and personal papers. Second, many important print artifacts from the early twentieth century exist in forms other than that of their initial publication. Jeffrey S. Drouin identifies the benefits to be gained from surmounting this obstacle when he defines periodical studies as "the practice of reading a magazine as having an editorial unity that places content items in

meaningful relations to one another, multiplying the possibilities for interpretation, especially when we have often come to know many of those items in isolation owing to their subsequent individual publication, anthologizing, and canonization” (5). When conducted correctly, print studies places the scholar in the position of the book’s or periodical’s original readers, considering not only the content and (in the case of periodicals) the relationships between and among articles, but also the advertisements, cartoons, editorials, and reviews that may perhaps reveal something else about the cultural mindset.

### 1.6 Modernism and Science: A Few Important Studies

The relationship between science and modernism in the early twentieth century has gradually been gaining an increasing amount of scholarly attention over the last three decades. Two important studies that paved the way for subsequent research analyzing science and literature during the modernist era are Stephen Kern’s *The Culture of Time and Space: 1880-1919* (1983) and Thomas Vargish and Delo E. Mook’s *Inside Modernism: Relativity Theory, Cubism, Narrative* (1999). Sources following their precedent tend to adopt one of two different methodologies: either 1) they examine and evaluate the conceptual or structural affinities between literary texts and scientific discoveries, or 2) they establish direct connections between specific authors and scientific concepts about which they can be definitively proven to have read or written. Each of these approaches can be problematic, though for different reasons. Those who adhere to the first methodology frequently fall victim to the false assumption that temporal and geographic proximity between literary and scientific figures necessarily correlates with causality in their work. The second methodology falters in its exclusivity, often focusing on an author in isolation at the expense of the surrounding socio-cultural changes and the communal nature of the modernist movement. In this dissertation, I strive to move beyond these difficulties by

illuminating the role of print culture in disseminating scientific thought throughout British society while also attending to the literary modernists' interaction with popular science materials. By investigating the influence of science in both their public and private writings, I aim to adopt an inclusive model for understanding the network of relationships that connected and mutually conditioned literary authors, scientists, publishers, and the reading public.

Through the present research, I seek to join an expanding scholarly conversation that avoids the aforementioned pitfalls by attributing to print culture its proper importance. Several books in particular have helped inspire this project and provide a methodological and conceptual framework for its composition. First among these is Michael H. Whitworth's *Einstein's Wake: Relativity, Metaphor, and Modernist Literature* (2001), which is primarily concerned with the construction of scientific metaphors and the ways in which they were used to explain scientific discoveries to lay audiences and the effects that they had on literary modernists. Whitworth argues that metaphors were a powerful tool that allowed scientists, mainly Einstein and others writing about relativity, to transform the complexity of their ideas into easily digestible language for average readers. He explains that he is interested in "not so much examining relativity and modernism as examining certain metaphors in their textual and historical context; that these metaphors may be found in both scientific theories and in descriptions of modernist literary form is particularly convenient" (1). Whitworth's main source for popular science writing, though he does refer to others, is Eddington's *The Nature of the Physical World*, and he focuses on the writing of Joseph Conrad, Virginia Woolf, T. S. Eliot, and D. H. Lawrence. In his research, he considers a variety of periodicals to make direct connections with the authors, such as *Nature*, *The Athenaeum*, *The Times Literary Supplement*, *The New Statesman*, and a few others.

A second major source for this project is Holly Henry's *Virginia Woolf and the Discourse of Science: The Aesthetics of Astronomy* (2003). This book contains a wealth of information on Woolf's relationship to science, and some relating to other authors as well. Henry makes a multitude of connections between Woolf and popular science writing, especially that of James Jeans, and accounts for several key periodicals and the general social atmosphere of the time. She explains that her project "investigates how advances in astronomy, made possible by a new generation of telescopes in the early decades of the twentieth century, had a shaping effect on work by Woolf and other British writers who were her contemporaries, including Olaf Stapledon, Vita Sackville-West, Roger Fry, Bertrand Russell, H. G. Wells, T. S. Eliot and others" (7). In addition to the acuity of her methods and research, Henry's study is valuable because it readily situates and discusses Woolf within her socio-cultural context, looking at cartoons dealing with science, new technologies that excited the population, and the famous solar eclipse of June 1927, which Woolf viewed.

Although its topic is science and art rather than science and literature, Gavin Parkinson's *Surrealism, Art and Modern Science: Relativity, Quantum Mechanics, Epistemology* (2008) represents a landmark study on the intersection of science and modernism. The other main sources of inspiration for this project mention and briefly discuss relativity and quantum mechanics, but Parkinson's book provides an in-depth explanation of the timeline, discoveries, and significant figures related to their development. Moreover, he recognizes the philosophical and epistemological implications of relativity and quantum mechanics and links them to the Surrealists. Parkinson's goal in *Surrealism, Art and Modern Science* is "to show primarily how the 1930s alliance with [French philosopher of science Gaston] Bachelard both sanctioned and refocused the direction taken by Surrealism, equipping it with a language emphasizing the

*coupure* that lay between it and previous forms of (Enlightenment) knowledge” (8). Parkinson’s point about formulating a new language that could account for the epistemological changes of the early twentieth century is one that will likewise be explored in this dissertation.

Another source contributing to the conversation surrounding modernism, science, and print culture is Jeffrey S. Drouin’s *James Joyce, Science, and Modernist Print Culture: “The Einstein of English Fiction”* (2015). A critical aspect of Drouin’s study is his intimate knowledge of several periodicals of the early twentieth century, mainly *The Egoist* and *The Little Review*, which he largely acquired working as one of the directors for the *Modernist Journals Project*. Like Henry’s focus on Woolf, Drouin’s main author is Joyce, whom he chose to fill what he sees as a gap in Whitworth’s research, but he discusses Eliot, Ezra Pound, and Wyndham Lewis as well. By “examining the discourse of science and the novel” articulated in the periodicals that serially published Joyce’s later works, *Ulysses* and *Work in Progress*, Drouin intends to “shed light on how that discourse changed—or not—after the introduction of Einstein, as well as why the novel was the primary genre for modernists looking for new formal techniques to express their reactions to modernity” (4). As he conducts his study, Drouin dedicates a great deal of effort to making material connections between Joyce and science, more so than any other scholar here described.

A final source worth mentioning is Mark S. Morrisson’s *Modernism, Science, and Technology* (2017). Rather than conducting a specific study like the other scholars, Morrisson provides an outline for understanding the topic of science and modernism and an overview of its scholarly history. In addition to explaining the changes that occurred in the physical, life, and social sciences, which are discussed in separate chapters, he continuously mentions an array of modernists that were connected to the different disciplines. Although Morrisson engages with

neither print culture nor popular science writing, *Modernism, Science, and Technology* is a valuable toolbox that contains a wealth of information, sources, and ideas for further research.

My research is a continuation of the investigation into the overlap of science, modernism, and print culture traced through these five scholars. From a literary standpoint, it aligns most closely with Whitworth's study because a variety of authors will be considered rather than one specific figure. While he was writing *Einstein's Wake*, however, the digital archives of early twentieth century periodicals, like the *Modernist Journals Project* on which Drouin relies, were still in their nascent stage of development and therefore unavailable for his use. In *Virginia Woolf and the Discourse of Science*, Henry did not have access to these resources either, and although her research is insightful, it focuses on astronomy and its relationship to relativity, while I will also account for other concepts of post-Newtonian physics such as complementarity and uncertainty. Parkinson's book is the one most invested in science and the particular aspects of relativity and quantum mechanics, and his work covering these developments and their effects on surrealism provides a model for the current study, replacing surrealism with literary modernism. His study of science combined with Whitworth's array of authors and Henry's and Drouin's methodologies using popular science writing represents a synthesis close to what I adopt in the following chapters. I will, however, pay much greater attention to epistemological questions surrounding the advent of literary modernism and its depictions of the individual and collective experience of modernity as they matured alongside relativity and quantum mechanics.

## 1.7 Chapter Outlines

My second chapter, "Joseph Conrad and Scientific Naturalism: Revolutionizing Epistemology in *The Secret Agent*," approaches Conrad as a Janus-faced figure who rejects the positivist, materialist science of the Victorian era while anticipating the epistemology of quantum physics.

My research shows that scientific naturalists like T. H. Huxley, John Tyndall, and Herbert Spencer employed periodicals such as the *Fortnightly Review* (f. 1865), the *Contemporary Review* (f. 1866), and *Nineteenth Century* (f. 1877) to define, professionalize, and gender science as a masculine endeavor. In doing so, they succeeded in advancing a strictly empirical approach to the universe, one that Conrad challenges in *The Secret Agent* (1907). By analyzing this novel's depictions of science, print, and society, I contend that Conrad provides a narrative framework for understanding the collapse of Victorian scientific epistemologies and probes the possibility of artistically representing a nonclassical form of knowledge centered on that which cannot be known.

My third chapter, "Early Modernist Periodicals and the Science of Poetry and Prose," maps the advent of early modernism as it emerged alongside new scientific discoveries within a rapidly expanding popular culture. I first examine a sequence of little magazines consisting of the *Freewoman* (f. 1911), the *New Freewoman* (f. 1913), and the *Egoist* (f. 1914) to demonstrate that the maturation of early modernism was intertwined with the rhetoric and epistemology of contemporary scientific discourse. Through their editorial work and regular contributions, crucial figures such as Dora Marsden, Ezra Pound, and T. S. Eliot looked to science as a source of cultural authority and legitimation for their philosophical and aesthetic theories. Turning my attention to the *Criterion* (f. 1922) as evidence for the institutionalization of modernism, I then argue that as modernism transitioned from its early to later stages, the movement successfully forged a relationship with science through which it achieved an equal level of cultural prestige without sacrificing its independence from mass trends.

My fourth chapter, "James Joyce's Hauntology of the Subject," draws together the theme of desire in Joyce's *A Portrait of the Artist as a Young Man* (1916) and *Ulysses* (1922), Derrida's

theory of “hauntology,” and the (il)logic of quantum physics to argue that Joyce’s work suggests a postmodern, scientifically-grounded means of conceptualizing the non-origins of what is neither wholly present nor wholly absent. While Joyce’s affinity for science and exposure to quantum physics are well documented, scholars have failed to recognize how his understanding of desire anticipates an epistemological structure of “the trace,” a crucial concept in both Derrida’s critique of ontological naiveté and quantum physics. By using Derrida’s hauntology to illuminate the function and operations of desire in *Portrait* and *Ulysses*, I demonstrate that high modernism, deconstruction, and quantum physics are united in reconceptualizing subjectivity and history as trace structures defined in relation to the unknowable.

My fifth chapter, “Virginia Woolf and a Climate of Uncertainty,” pursues the subjective and cultural significance of Woolf’s depictions of the weather in her later fiction as they took shape after the popularization of quantum physics in the late 1920s and early 30s. I claim that through her reading of popular science books by British physicists such as Arthur Eddington and James Jeans, Woolf’s theories of modern fiction coalesced with the quantum concept of uncertainty as she honed her writing style toward the end of her life. In her last two novels, *The Years* (1937) and *Between the Acts* (1941), Woolf employs the weather and its unpredictability as a symbol for the increasing cultural prevalence of uncertainty in the wake of quantum physics and in the face of World War II. By analyzing these two novels along with selections from her diaries and essays, I assert that the weather becomes for Woolf a means of probing the domestic implications—both in terms of modernist subjectivity and the British nation—of the climate of uncertainty that defined the interwar period.

My conclusion argues that a continued development of a cultural matrix of encounters requires that special attention be paid to the role of books and periodicals in articulating and



proliferating the rhetoric and epistemology of science. The goal of print studies as it has sprouted within modernist studies is to identify the original presentation of scientific discoveries as modernist authors initially encountered them and trace the connections between these ideas and the authors' previous and subsequent work. Having demonstrated the ways in which modernism and science engaged with an epistemology of the unknowable through print, my dissertation concludes by urging scholars to continue examining books and periodicals to further reveal the network of cultural relations from which modernism emerged and to which it contributed.

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169-74.

## CHAPTER 2. JOSEPH CONRAD AND SCIENTIFIC NATURALISM: REVOLUTIONIZING EPISTEMOLOGY IN *THE SECRET AGENT*

### 2.1 Introduction

In the “Author’s Note” (1920) to *The Secret Agent* (1907), Joseph Conrad admits that the novel’s origins can “be traced to a period of mental and emotional reaction” during which he felt discouraged with the lack of authenticity surrounding him (228). Although his “sense of the truth of things was attended by a very intense imaginative and emotional readiness,” he still felt “left behind, aimless amongst mere husks of sensations and lost in a world of other, of inferior, values” (229). Channeling these frustrations into *The Secret Agent*, Conrad presents just such a world of inferior values, one that revolves around the popularity of science during the nineteenth century. As Vladimir, the secretary of an unnamed embassy, proclaims to Adolf Verloc, his undercover agent provocateur, while discussing possible ways to shock the British population, “The sacrosanct fetish of today is science” (23). Indeed, Vladimir emphasizes, “Any imbecile that has got an income believes in that. He does not know why, but he believes it matters somehow” (24).

Responding to Vladimir’s vitriolic description of science in Victorian society, scholars have generally argued that it reflects Conrad’s pessimism regarding theories of evolutionary degeneracy and the scientific emphasis on causality and determinism,<sup>8</sup> all of which he depicts in *The Secret Agent*. While these interpretations offer insight into Conrad’s views of specific facets of scientific thought, they tend to overlook the ways that he engages the broader and more historically significant movement of scientific naturalism. Led by biologist T. H. Huxley and

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<sup>8</sup> For two full-length monographs on Conrad’s relationship with Darwinian evolution, see Hunter and O’Hanlon. For specific analyses of evolutionary degeneracy in *The Secret Agent*, see Hunter 153-219, Ray, and Greenslade 88-119. Scholars addressing causality and determinism in the novel include Peters, Whitworth, and Attridge.

physicist John Tyndall, the scientific naturalists were a group of nineteenth-century intellectuals who sought to remove religious influences from science and professionalize the discipline as an exclusive domain for only the properly-trained elite. A dominant cultural force throughout England in the latter half of the nineteenth century, the scientific naturalists strategically used a range of publicity tactics and the rise of mass print culture to acquire their prestige and integrate their epistemology into mainstream conceptions of science. By focusing on scientific naturalism as the “sacrosanct fetish” in *The Secret Agent*, I contend that Conrad’s concern with science extends beyond its effects on human ways of knowing to the ways in which a secularized scientific worldview contributed to the degradation of cultural values that he laments in the “Author’s Note.” Although Conrad was highly skeptical of religion as the absolute cultural authority on issues of truth and morality,<sup>9</sup> his critical engagement with scientific naturalism as the reigning form of science during the Victorian era suggests the extent to which he equally doubted that science could serve as a more viable and authentic alternative.

Cedric Watts has observed “that if any god presides over Conrad’s best work, it is the god Janus. Janus is the two-headed god: he looks in opposite ways at the same time; he presides over paradox; and he is the patron of janiform texts” (7). Watts’s description holds true for *The Secret Agent*, a novel that Conrad set in 1886 and labeled “a simple tale of the XIX century” yet published for a twentieth-century audience (2). In what follows, I approach *The Secret Agent* as an epistemologically janiform text that retrospectively parodies the sensationalism of scientific naturalism’s material-empiricist worldview while also anticipating the absolute limits of knowledge dealt with in quantum physics. My perspective therefore synthesizes three critical topics in scholarly studies of Conrad’s work—his interest in science, ambivalence toward mass-

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<sup>9</sup> See, for example, Lester.

market journalism, and skepticism of absolute forms of knowledge<sup>10</sup>—to illuminate his treatment of the popularization of science in print and its ability to shape epistemological socio-cultural discourses.

Scholars such as Michael Whitworth and John Attridge have addressed the transitory nature of *The Secret Agent*, arguing that it challenges the certainty of Victorian notions of causality and determinism. Put loosely, causality refers to the idea that nothing happens without a cause, and that the state of a thing at any given instant follows from the state of that thing at any preceding instant according to inexorable laws of nature. Similarly, determinism is understood as the idea that if the past and present states of a thing are known, then the future states of that thing can also be known by applying the same laws. Maintaining that Conrad rejects such ideas, Whitworth and Attridge explain that he adheres instead to a descriptivist view in which “the data of science ultimately consists of sensations, and that scientific knowledge amounts to nothing other than convenient symbolic representations of this basic stuff” (Attridge 126). My analysis of *The Secret Agent* pushes the implications of Conrad’s thinking further to reveal that his account of scientific naturalism, its spokespeople’s use of print, and its growing cultural authority causes him to confront the existence and influence of things that are completely beyond the human capacity to know. In rebuffing the cultural imperialism of science, Conrad establishes a narrative framework for understanding the collapse of Victorian scientific epistemologies and probes the possibility of artistically representing a revolutionary form of knowledge centered on that which cannot be known.

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<sup>10</sup> See Donovan, “Prosaic Newspaper Stunts,” and Rubery for general sources on Conrad and sensational journalism. For discussions of this topic dealing specifically with *The Secret Agent*, see Mallios and Nohnberg. Two other studies of interest are Artese, which examines the idea of anonymous journalism and aspects of testimony, and Donovan, *Joseph Conrad and Popular Culture*, which provides a broader analysis of Conrad’s relationship with popular culture. For sources on Conrad’s skepticism of human knowledge, see, among others, Wollaeger, Panichas, and Schnauder.



## 2.2 Conrad and Scientific Naturalism

By way of a brief history, scientific naturalism was an intellectual movement during the second half of the nineteenth century that was largely responsible for defining the modern figure of the scientist and developing the discipline of science into its current state.<sup>11</sup> In addition to Huxley and Tyndall, a variety of influential figures from a spectrum of specializations may be counted among the scientific naturalists, including botanist Joseph Hooker, mathematician William K. Clifford, eugenicist Francis Galton, philosopher of social Darwinism Herbert Spencer, and author and literary critic Leslie Stephen. Although far from unified in their beliefs, these thinkers shared a desire to professionalize science and define strict criteria for those qualified to conduct it. Aiming to increase the standing of science in society and the clergy-dominated university system, the scientific naturalists strove to stigmatize the work of amateurs and clerical scientists as unworthy of the elite discipline they were trying to establish. As Frank M. Turner explains, the scientific naturalists “sought to create a largely secular climate of opinion no longer dominated by religion that would permit the theories and practitioners of modern science to penetrate the institutions of education, industry, and government for the material progress and social amelioration of the nation” (*Contesting* 131). Believing themselves to possess a superior understanding of the nature of truth, the scientific naturalists employed lectures, speeches, exhibitions, and a vast range of print venues to publicly attack their critics and promote their arguments for professionalization. In doing so, they established themselves as some of the most remarkable and influential figures of the nineteenth century. Reflecting on this “the cult of

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<sup>11</sup> In their introduction to *Victorian Scientific Naturalism: Community, Identity, Continuity*, Gowan Dawson and Bernard Lightman provide an overview of the complexities surrounding the use of “scientific naturalism” and “scientific naturalists” as historical categories. While these terms are not inaccurate, “their shifting and overdetermined original meanings” should be acknowledged (9). The thought of the scientific naturalists also displays some inherent contradictions, as Lightman (“Fighting Even with Death”) and Levine (“Paradox”) discuss.

science,” as she called it, Beatrice Webb, friend of Huxley and Tyndall, pondered, “who will deny that the men of science were the leading British intellectuals of that period; that it was they who stood out as men of genius with international reputations; 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” (130-31).

Heavily influenced by Auguste Comte’s notion of positivism and John Stuart Mill’s logical system, the scientific naturalists advocated a material-empiricist worldview founded on the idea that knowledge was a product of sensory interactions with physical phenomena. For them, legitimate science was defined as the empirical practice of observing and experiencing those phenomena and then formulating absolute laws to describe them and their causal relationships with each other. Turner points out that this glorification of empiricism generated “charges of reductionist materialism,” so “[s]everal of the spokesmen for scientific naturalism employed force or related concepts” in their counterarguments (*Contesting* 146). Huxley, for instance, frequently responded to accusations that he was exclusively materialistic by expressing belief in metaphysical causality. Tyndall, however, proudly accepted the label of materialist, articulating a remarkably materialistic view of the universe in his famous Belfast Address of 1874.

Alongside materialism, positivism—the belief that valid knowledge is exclusively *a posteriori*, derived from rationalism and empiricism—likewise played a crucial role in defining the epistemology of the scientific naturalists. While they each held nuanced views of positivism, Turner explains that it served as an overall effective means by which to “undermine the intellectual legitimacy of alternate modes of scientific thought and practice” and establish “their

epistemology as the exclusive foundation for legitimate science and as the correct model for knowledge generally” (*Contesting* 182). As an “intellectual solvent,” positivism could “cleanse contemporary science of metaphysical and theological survivals” (182). Although certain late nineteenth-century scientific developments, such as those dealing with thermodynamics and radiation, and the new physics of the early twentieth century, namely relativity theory and quantum theory, eventually undermined their views, the scientific naturalists were ultimately successful in revolutionizing science and establishing the figure of the modern scientist as a properly-trained specialist free from theological influence.

Well-attuned to contemporary currents of scientific thought, Conrad frequently voices disbelief in his letters about the ability of classical epistemologies like scientific naturalism to discover and formulate truth. Early in his writing career, for example, he wrote to R. B. Cunninghame Graham expressing his frustration with the dominant model of the universe: “There is a—let us say—a machine. It evolved itself (I am severely scientific) out of a chaos of scraps of iron and behold!—it knits. I am horrified at the horrible work and stand appalled” (*CL* 1: 425). Conrad’s sarcastic description of the universe as an impersonal knitting machine is intended to lampoon the mechanistic view of reality that the scientific naturalists embraced. A few years later in 1901, Conrad published a letter in the “Saturday Review” section of *The New York Times* in which he disputes science’s ability to produce any authentic form of truth. Science, he claims,

is not concerned with truth at all, but with the exact order of such phenomena as fall under the perception of the senses. Its conclusions are quite true enough if they can be made useful to the furtherance of our little schemes to make our earth

a little more inhabitable. The laws it discovers remain certain and immovable for the time of several generations. (*CL* 2: 348)

Conrad's view that scientific laws are pragmatically and historically relative sets him in opposition to the belief among the scientific naturalists that their conclusions about reality were absolute and universally applicable.

Throughout his life, Conrad continued to cast doubt on science's ability to develop inexorable laws of nature and human behavior, writing in 1913, "It talks to us of the Laws of Nature. But that's only one of its little jokes. It has never discovered anything of the sort. It has made out with much worry and blundering certain sequences of facts beginning in the dark and leading god knows where. And it has built various theories to fit the form of activity it has perceived" (*CL* 5: 238). Reflecting the skepticism of David Hume, Conrad thus suggests that the sequencing of phenomena so often used in science to support notions of causality and determinism is merely a biased projection onto an ultimately unknowable world. For him, scientific "laws" are merely laws of convenience that enable scientists to further their political aims without ever coming closer to the truth.

### 2.3 Tracing Scientific Naturalism in *The Secret Agent*

Although much of Conrad's fiction depicts an attitude toward science like that expressed in his letters, his most poignant critique is found in *The Secret Agent*, a novel that he labelled a "piece of ironic treatment applied to a special subject" (*CL* 3: 371). Scholars such as Ian Watt, Zdzislaw Najder, and George Levine have pointed out the likely connections between scientific naturalism and Conrad's work, noting both linguistic and ideological similarities.<sup>12</sup> Yet their investigations

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<sup>12</sup> See Watt 162-65, Najder 249-50, and Levine "Paradox."

have focused almost exclusively on Huxley's "Prolegomena" (1894) to "Evolution and Ethics" (1893) in relation to *Heart of Darkness* (1899) at the expense of Conrad's subsequent works. By interpreting Conrad's "special subject" in *The Secret Agent* as scientific naturalism, I contend that he continued to grapple with the logic of this movement and its cultural implications after writing *Heart of Darkness*. Conrad is subtle in his engagement, however, placing the influence of science out of plain sight. As Comrade Ossipon describes in *The Secret Agent*, "Science reigns already. It reigns in the shade maybe—but it reigns" (223). Although Conrad never uses the term "scientific naturalism," he scatters clues throughout the novel that reveal its power to shape collective cultural mentalities, socio-political institutions, and the thoughts and behaviors of individuals.

Conrad's interrogation in *The Secret Agent* of the general cultural value of science is clear. Calling professors of science "intellectual idiots" (24), Vladimir explains to Verloc that his terrorist act "must be against learning—science" (25). As he expands on his frustration, Vladimir remarks that he is particularly perturbed that the bourgeoisie has apparently accredited the dominant form of learning with the material development of society, expressing that they "believe that in some mysterious way science is at the source of their material prosperity" (25). Vladimir's historically accurate observation refers to the success that the scientific naturalists had achieved with disseminating their material-empiricist worldview and fusing it to popular conceptions of social development by the time of the novel's events in 1886. While they publicly denied charges of reductive materialism, they were eager to point out and emphasize the material benefits of science to garner public support for their goals. In "On the Advisableness of Improving Natural Knowledge" (1866), for instance, Huxley glorifies science for enabling the invention of ships, railways, telegraphs, factories, and printing presses, "without which the whole

fabric of modern English society would collapse into a mass of stagnant and starving pauperism” (25).

Huxley’s argument that science was responsible for the material salvation of society was widely accepted throughout England during the mid- to late nineteenth century. It was also an idea that was imbued in Conrad’s close friend and Huxley’s pupil H. G. Wells, to whom *The Secret Agent* is dedicated. An outspoken materialist himself, Wells studied under Huxley at the Normal School of Science from 1884-85 and frequently expressed admiration for his intellectual mentor. In his *Experiment in Autobiography* (1934), Wells praises Huxley as “the acutest observer, the ablest generalizer, the great teacher, the most lucid and valiant of controversialists” and describes his class as “beyond all question, the most educational year of my life” (159; 161). Considering Conrad’s dedication in *The Secret Agent* and his intellectual sparring with Wells over the years, his “ironic treatment” of science in the novel is likely a means of amicably criticizing not only his friend’s materialist beliefs but also the great educational influence that cultivated their growth.

While the bourgeoisie of *The Secret Agent* and the novel’s dedicatee have bought into their arguments about the material benefits of science, the scientific naturalists also assert their influence at the political level through Sir Ethelred, the Secretary of State, and his efforts to pass his “Bill for the Nationalisation of Fisheries” (106). Somewhat playfully, Conrad employs both Ethelred’s name and his bill to show that the workings of the state are also permeated with scientific naturalism’s material-empiricist way of thinking. Through his analysis of Inspector Heat’s name in relation to thermodynamics, Michael Whitworth has demonstrated that Conrad uses names to indicate matters of thematic cultural significance and encourage their further critical examination. I argue that this narrative strategy also applies to Ethelred, whose name is

only a slight anagram for “ether-led.” During the Victorian era, ether was the imagined material medium spread throughout the universe that was supposedly necessary for the propagation of light waves. Although it was not specific to scientific naturalism, ether was a pillar supporting this worldview because it enabled the empirical observation that produced knowledge. Huxley, for example, summarizes sight as the result of when “vibrations of the luminiferous ether of a certain character fall upon the retina” (“Science and Morals” 122). In addition to believing that ether facilitated the production of knowledge, the scientific naturalist also used the concept of ether to complete their mechanistic model of the universe. Tyndall describes “an all-pervading ether” whose invisible billows “can be measured with the same ease and certainty as that which an engineer measures a base and two angles, and from these finds the distance across the Thames” (“On the Study of Physics” 293). Responding to what he saw as a glorification of ether, Frederic W. H. Myers accused Clifford and his associates of seeing a world made only “of ether and atoms” (132).

In *The Secret Agent*, ether functions synecdochally for scientific naturalism, meaning that Ethelred belongs to an “ether-led” society that acts upon the authority of its spokespeople, a relationship that Conrad parodies through Ethelred’s name and his fisheries bill. In 1883, three years before Verloc’s assignment, Huxley gave the inaugural address at the International Fisheries Exhibition in London. Responding to fears that fish populations were being depleted, Huxley argued that the sea was essentially inexhaustible, and, rather than fretting over the possibility of overfishing, the fishing industry should modernize and develop a national commission for harvest and research like those established in other countries. Conrad weaves the historical context of Huxley’s fisheries argument into the composition of Ethelred’s bill and Verloc’s conversation with Ethelred’s secretary, Toodles. When Verloc visits the Secretary’s

office, he discovers that Ethelred and Toodles have been busy conducting research on the topic of Huxley's address. Toodles explains that Ethelred is "sitting all alone in his room thinking of all the fishes in the sea" (157), after which the narrator remarks that Toodles's "erudition on the subject of the fishing industry was fresh and, in comparison with his ignorance of all other industrial matters, immense" (158). In researching, writing, and sponsoring legislation for the nationalization of the fishing industry shortly after Huxley's address, Ethelred and his staff are being led by the advice of perhaps the most outspoken of the scientific naturalists. His bill therefore indicates that the logic of scientific naturalism was shaping the thoughts and policies of high-ranking members of the British government.

For Vladimir, the most efficient way to disrupt the dominant form of science reigning throughout the "ether-led" London of *The Secret Agent* would be "if one could throw a bomb into pure mathematics" (25). His specification of the mathematical target as "pure" refers to the nineteenth-century divorce between mathematics and physics that produced the purely logical form of reasoning free from metaphysical agencies upon which scientific naturalism was built. Untethered from the physical world, pure mathematics exemplifies a purely logical form of reasoning embraced among scientific naturalists that rejected the need for metaphysical agencies. As Conrad would have certainly known, an attack on mathematical logic was an attack on the foundation of the foremost scientific epistemology of the Victorian era. In Frank M. Turner's landmark study of scientific naturalism, *Between Science and Religion*, he identifies three main tenets of its cosmology: Dalton's atomic theory, the law of the conservation of energy, and evolution, all of which were perceived in terms of mathematical logic. According to Turner, Dalton's atomic theory "allowed for a mechanical and mathematical concept of matter" (25). While Dalton provided a mathematical means of understanding nature as a finely-tuned



mechanism, the “law of the conservation of energy explained the operation of the machine and established the limits to what was scientifically and naturally possible within the realm of nature” (26-27). Since the quantity of energy in the universe remains fixed, Turner observes, mathematical logic could be used to explain the past, present, and future states of both natural and imagined phenomena. As one of the former, Darwinian evolution could be formulated as a causal and, at least for some progressive thinkers like Spencer, deterministic logical process leading to a foreseeable conclusion. Turner notes, “Natural selection brought organic forms under a theory of change analogous to that under which the nebular hypothesis brought physical forms. It reduced modifications in organic structures to rearrangements of matter and energy requiring no supernatural agencies” (28). For the scientific naturalists, then, mathematical logic provided a new means by which they could explain the mechanistic workings of the universe beyond even the capacity of Newtonian physics.

Since bombing pure mathematics is not a realistic assignment, Vladimir selects instead Greenwich Observatory, a symbolic location for Conrad’s “ether-led” London that maintains the mathematical logic underlying scientific naturalism as the real target. Greenwich Observatory serves as a powerful representation of Western imperialism and the self-proclaimed dominance of scientific naturalism’s worldview. In addition to its use as an astronomical observatory, Greenwich was officially adopted as the world’s Prime Meridian in 1884, henceforth serving as the basis of world standard time and temporally fixing every spatial point on the globe in relation to London. Multiple scholars have examined the significance of Greenwich Observatory in *The Secret Agent*, especially in relation to notions of time, power, and colonialism.<sup>13</sup> According to Adam Barrows, the adoption of the meridian indicates that time was “intrinsically politicized in

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<sup>13</sup> See, for example, Hama, Peters, and Bernstein. For a more general cultural study of time during the late nineteenth century, see Kern 1-108.

this period, bound up as it was with the problematics of imperial control and global conceptualization” (263). In addition to the politization of time, however, Greenwich Observatory also politicized the human bodies subject to that time and the celestial bodies above them, thereby making both additional components of the scientific naturalists’ completely knowable mechanistic universe. Greenwich Observatory thus demonstrates the power of mathematical logic when applied to the physical world to construct an empirical empire in which all things belong to the same absolute schematic.

Besides Greenwich Observatory, Conrad depicts several other modalities of the mathematical logic of scientific naturalism in *The Secret Agent* to stress the extent to which the novel’s England is under science’s sway. While Greenwich Observatory directs its material-empiricist gaze upwards, the London police and adherents to Lombrosian criminal anthropology direct their gazes outward with the same imperial purposes. Scholars such as Mark Conroy and William W. Moseley, Jr. have read Conrad’s London as a panoptical society in which the police establish and maintain their power through an ever-present gaze. Summarizing their views, Ludwig Schnauder explains that the police and their informants seem to be everywhere and observe everything, thereby allowing them a measure of control over the city and its inhabitants: “Due to their ubiquitous presence and their sophisticated system of surveillance the forces of law and order are capable of wielding enormous power not just over the life of the individual but over society as a whole” (219).

Conrad provides the power of mathematical logic with an ideological form in *The Secret Agent* through his representation of Lombrosian criminal anthropology, which supposedly enabled the ability to peer into the essence of human beings to qualify their ancestry and predict their future behavior. Norman Sherry and others have attended to the ways that Conrad parodies

criminal anthropology through Ossipon's overt devotion to Lombroso, observing also that Conrad describes many of the characters using degenerative stereotypes (Sherry 248-83). As someone who has "submitted to the rule of science" (217), Ossipon undoubtedly exemplifies the possible consequences of when individual citizens take the mathematical logic of scientific naturalism too far. After he learns that Winnie has murdered Verloc, Ossipon lapses into a mental state in which his scientific beliefs completely commandeer his thought: "He gazed scientifically. He gazed at her cheeks, at her nose, at her eyes, at her ears. . . . Bad! . . . Fatal! Mrs Verloc's pale lips parting, slightly relaxed under his passionately attentive gaze, he gazed also at her teeth. . . . Not a doubt remained . . . a murdering type. . . ." (217). Quickly and confidently reducing Winnie to a taxonomic category, Ossipon's scientific gaze enacts on a personal level the same process of coming to know that operates through Greenwich Observatory and the London police.

The imperial power of the material-empiricist gaze in *The Secret Agent* has also apparently been embraced in the upper classes of British society. Perhaps the best barometer for the bourgeoisie's relationship with science is the lady patroness of Michaelis. Noted to be "intelligent" and "curious at heart," the patroness surrounds herself with intellectuals, including "men of science," who "show best the direction of the surface currents" (77). While she is undoubtedly aware of the ideas of Huxley, Tyndall, and other scientific naturalists through these gatherings, her "practical mind" and tendency to enjoy following "what the world was coming to" are characteristics that would have likely prompted her to collect and read their writings on her own. Significantly, the patroness's manner of interacting with visiting intellectuals at her home is described as a succinct, empirical process: They are "listened to, penetrated, understood, appraised, for her own edification" (77-78). Although she is presented more positively than

Ossipon, they both perceive, comprehend, and assign value to those around them according to the logic underlying scientific naturalism for personal reasons. Through these two characters, Conrad points out the risk of dedicating oneself too fully to science. If the patroness should take her devotion to knowledge a step further, she could easily become another Ossipon.

## 2.4 Scientific Naturalism and Print Culture

When shining light into the “shade,” where Ossipon noted that science reigns, Conrad’s *The Secret Agent* depicts an “ether-led” London permeated with the influence of scientific naturalism. At the cultural level, Greenwich Observatory, the police’s panoptic vision, and Lombrosian criminal anthropology demonstrate the ways in which the mathematical logic of scientific naturalism manifest itself in social institutions and popular ideologies. More personally, Ethelred, Ossipon, and the patroness show that high-ranking officials, common citizens, and members of the bourgeoisie alike are buying into modalities of the same material-empiricist way of thinking and allowing it to shape their thoughts, behaviors, and policies. Conrad’s ironic critique of scientific naturalism extends beyond its epistemological and cultural influence to encompass also the material means by which this “sacrosanct fetish” took hold of British society. By targeting print culture as a conduit for spreading this approach to knowledge, Conrad engages the Victorian union of science and print and thereby cautions the nation about print’s burgeoning ability to enable the mass proliferation of information and ideas that could be false or misleading.

As much as science itself, *The Secret Agent* interrogates the nineteenth-century eruption of the print industry and the ways that print helped forge a mass consumer culture permeated with scientific naturalism’s epistemology. Around the 1840s, a rapid series of industrial developments produced the steam-printing machine, machine-made paper, stereotyping

technology, and cheaper case bindings, all of which greatly increased printing efficiency (Lightman 31). The invention and improvement of photography and lithographic techniques also had a huge impact on print, allowing books and periodicals to include more detailed images than ever before. Moreover, printed material became much cheaper to produce and purchase when the “taxes on knowledge,” which taxed paper, political content, and advertisements, were repealed in mid-century (31). The publishing industry further benefited from the use of rotary printing, hot-metal typesetting, and electric-powered machinery.

Although these developments produced an unprecedented volume of printed material, eager audiences from a spectrum of social classes emerged to match the supply. Due to the passage of legislation beginning with the Education Act of 1870 that made school attendance compulsory, literacy rates soared throughout England until illiteracy was virtually non-existent by the end of the century (Vincent 22). Jose Harris explains that this combination of print and readership “generated a new national popular culture—a culture that evoked new market responses in the form of mass-circulation newspapers (which in turn began to reinforce the process of mass production of attitudes and cultural unification)” (21). Significant expansions to the British railway system aided in the distribution of mass-circulation material, which became increasingly specialized to meet the demands of new segments of the population. Census data also indicates that many people were not content to simply consume print; they wanted to take part in its production too. By the turn of the century, a surging number of citizens thought of themselves as authors, editors, journalists, or publicists (Leary and Nash 173). Because of these changes, around 125,000 periodical and newspaper titles appeared in nineteenth-century England alone (North 9).

Set amidst the print-culture boom, *The Secret Agent* depicts the near ubiquity of print in England at the time and the eagerness of private citizens to participate. Verloc's seedy shop, for example, sells a variety of printed material enabled by recent developments, including photographs, several "French comic publications," bottles of ink, some books, and "a few apparently old copies of obscure newspapers" (3). Verloc's arrival at the shop is also noted to be "unheralded by the Press" (5), and the first person he sees at Vladimir's embassy—"the man of papers" (13)—is reading a newspaper. Responding to Vladimir's assertion that he is unaware of current events, Verloc states that "he was in the habit of reading the daily papers" shortly before the focus of their conversation shifts to "a grey sheet of printed matter" (19; 20), one of the anarchists' leaflets. In addition to their propaganda, the anarchists are also engaged with other forms of authorship: Ossipon has written "a popular quasi-medical study" (34), and Michaelis spends much of the novel penning his autobiography. Ossipon also carries a newspaper in his pocket during each of his two meetings with the Professor. Moreover, as the Professor recounts his chance meeting with Heat, he imagines that the law official must have been thinking "of newspapers" (52). Ossipon also claims to be "in touch with a few reporters on the big dailies" (58), and the Assistant Commissioner plays whist with an "editor of a celebrated magazine" (76). As Heat ponders pinning the failed bombing on Michaelis, he understands that his public success would depend "on the newspaper press" (84). After Winnie murders Verloc, she cannot stop thinking about newspapers, and her suicide is later reported in one.

The overwhelming presence of printed material in England provided a multiplicity of venues through which the scientific naturalists could make their arguments for professionalization and promote their material-empiricist worldview. Conrad depicts one such venue in *The Secret Agent* with an allusion to popular science books when the Assistant

Commissioner reports to Ethelred and asks Toodles whether he knows “what a dog-fish is like” (158). Toodles’s response further exposes the extent to which London is “ether-led” and highlights the crucial role of print in making it so: “Yes; I do. We’re buried in special books up to our necks—whole shelves of them—with plates” (158). Toodles is prepared to answer questions about fish and fishing because he has been studying the topics to assist Ethelred with his bill to nationalize the fishing industry, which, as I pointed out earlier, is a response to Huxley’s public arguments on the matter. Huxley, however, not only promoted the nationalization of the British fishing industry; he also frequently wrote and lectured on fish as part of his broader interests in biology and vertebrates, even mentioning in a letter from 1888 to Michael Foster, a secretary of the Royal Society, that he had “taken a good deal of pains over drawing up a new syllabus—including dogfish” (Huxley, ed. 94). Furthermore, the “plates” that Toodles mentions are lithographic plates. A developing technology during the nineteenth century, lithographic plates were favored by scientists, especially biologists like Huxley, because they could produce highly-detailed images that allowed viewers to explore the epistemological importance of observation. Toodles, then, is responding to an inquiry about biology with a sarcastic description—one that calls to mind Conrad’s “ironic treatment” of his subject matter—of being “buried” in “special books” with these plates. These factors point to the likelihood that Ethelred’s collection is comprised of popular science books. In the late nineteenth century, two wide-spread popular science projects, the International Scientific Series and Macmillan’s Science Primers, dominated the markets, and they were both steeped in the influence of Huxley and other scientific naturalists. Ethelred’s shelves of books are therefore probably comprised of volumes from these series as he sought to understand ichthyology to aid the composition of his bill.

According to Bernard Lightman, Huxley joined the production of the International Scientific Series and Macmillan's Science Primers as part of a shift in his career toward publicly promoting the tenets of scientific naturalism: "Establishing connections with publishers, writing, and setting up ambitious monograph series with the goal of controlling the market for science books aimed at the general audience, Huxley now made these projects in print culture a central part of his overall strategy to reform British science and society" (*Victorian* 396). The International Scientific Series was an ambitious project that aimed to disseminate scientific knowledge to a variety of audiences. Between 1871 and 1910, over 120 titles were published in four languages in the United States and Europe (378). Along with Tyndall and Spencer, Lightman explains, Huxley was commissioned to lead the British component of the series, which allowed him to "exercise his power as editor to spread the principles of scientific naturalism without having to do all the writing himself" (381). Huxley, Tyndall, and Spencer all wrote volumes for the series, as did other scientific naturalists such as Clifford, John Lubbock, and Norman Lockyer.

Huxley was equally enthusiastic about Macmillan's Science Primers when he was recruited by Alexander Macmillan to serve as an editor and write the introductory volume. Lightman observes that this series offered Huxley yet another venue through which he could advance his views and "undermine the influence of popularizers steeped in natural history and theologies of nature" (*Victorian* 390). While other scientific naturalists like Lockyer, Clifford, and Hooker contributed books, Huxley was the most aggressive with promoting a strictly empirical approach to science in his *Science Primers: Introductory* (1880), essentially making, according to Lightman, "scientific naturalism constitutive of natural science" (395).



Although book series played a crucial role in extending the cultural and epistemological influence of scientific naturalism, its spokespeople were even more successful in achieving their goals through their relationships with important editors at key periodicals. In *The Secret Agent*, Conrad is attuned to this dynamic and addresses it as part of his critique of the means by which the “sacrosanct fetish” for science has come about. After lamenting that any “imbecile that has an income believes in [science],” Vladimir condemns all the “damned professors” and argues that “their great panjandrum has got to go” (24). Despite his bravado, he betrays a hint of fear when he comments that if aggravated they will certainly “be writing to the papers” (25). Indeed, throughout the latter half of the nineteenth century, the champions of scientific naturalism either worked as periodical editors or used their connections with periodical editors to see their ideas flourish. G. H. Lewes, the first editor of *The Fortnightly Review* (f. 1865), exemplifies the former category. According to Dawson, *et al.*, “The prominence of science was, from the very beginning, one of the defining characteristics of the *Fortnightly*” (20). Although he did not fit the model of the professional scientist that Huxley and Tyndall were putting forth, Lewes was an outspoken supporter of positivism and a materialist approach to nature, and he did not hesitate to use the *Fortnightly* to publish similar views.<sup>14</sup> Additionally, Dawson *et al.* point out that this periodical was the first major venue “to disavow anonymity and instead enforce authorial responsibility by a strict policy of signature” (20). Eager to develop public personas wedded to the prestige of their work, scientific naturalists like Huxley, Tyndall, and John Herschel took full advantage of the signed author policy. Over time, their signed contributions helped establish them as authorities in their respective disciplines, which, consequently, led to editors

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<sup>14</sup> In *History of Philosophy from Thales to Comte*, G. H. Lewes offers this material-empiricist definition of “Truth”: “Truth is the correspondence between the order of ideas and the order of phenomena, so that the one becomes a reflection of the other—the movement of Thought following the movement of Things” (xxxix).

increasingly soliciting their work—as opposed to the work of amateurs or clergymen—when they wanted to publish scientific material.

After Lewes left the *Fortnightly* in 1866, the avowed positivist John Morley assumed the editorship, continuing many of the periodical's original goals and policies. Meanwhile, James Knowles—founder of the Metaphysical Society, an intellectual debate club to which a handful of the scientific naturalists belonged—used his editorship at *The Contemporary Review* (f. 1866), which also adopted a signed author policy, to stage “some of the most ferocious arguments by Huxley, Tyndall, William Kingdon Clifford, and other scientific professionalizers in favour of the authority of trained scientific experts on social, intellectual and cultural questions that had traditionally been the province of clergymen” (Dawson, *et al.*, 21). Knowles eventually left the *Contemporary* to found *The Nineteenth Century* (f. 1877), taking many of his star contributors with him, including Huxley, who served as the science correspondent and enjoyed the freedom to publish on any topic he wished (Schwartz 363). Huxley's prestige at the *Nineteenth Century* helped make his name synonymous with science. As one contemporary put it in *The Illustrated London News* in 1894, “In England, when people say ‘science’ they commonly mean an article by Professor Huxley in the *Nineteenth Century*” (Lang 822). Along with Lewes, Morley, and Knowles, the scientific naturalist Lockyer used his periodical *Nature* (f. 1869), an exclusively scientific journal frequently populated with articles written by the scientific naturalists, to garner public support for the “professional” men of science. This outline of venues through which the scientific naturalists built and exerted their influence in society is far from comprehensive, but it

provides a glimpse into their remarkable presence in the rapidly expanding print industry and the collective cultural consciousness it was creating.<sup>15</sup>

Expanding his ironic treatment of scientific naturalism as the bourgeoisie's "sacrosanct fetish" to include its relationship with print, Conrad depicts various aspects of print culture in *The Secret Agent* as significant contributors to the novel's broader theme of decay. Scholars such as Alex Houen, Michael Whitworth, and Jill Clark have examined Conrad's understanding of the second law of thermodynamics—the law of entropy, which, in the simplest of terms, states that all matter within a closed system irreversibly decays toward a state of maximum disorder—as it was popularized in the second half of the nineteenth century.<sup>16</sup> Their research has also dissected the ways that *The Secret Agent* engages with entropy and decay through its depiction and performance of heat death, anarchism, degeneracy, and a variety of other *fin-de-siècle* concerns. What has been overlooked, however, is how the overall material decline and cultural decay of Conrad's London relates to the novel's presentation of print culture, especially in light of his allusions to the popular science writings of the scientific naturalists. The Verlocs' shop, of course, sells a variety of disreputable print items, but the narrator also remarks that some customers will, upon seeing Winnie, become disconcerted and buy ink instead, which, once outside, they "drop stealthily into the gutter" (4). Ink, the foundation of print and the great enabler of popularizing scientific naturalism, is treated as if it were less valuable than the shop's other goods. Beyond the Verlocs' shop, the whole of London seems filled with rotting paper and dreary periodical peddlers. The Professor comes from a street "littered with straw and dirty paper" (47), and when Ossipon first leaves the Silenus, he encounters "a dismal row of

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<sup>15</sup> See Dewitt 43-49 for an overview of how the scientific naturalists used other periodicals like *The Westminster Review*, *The Scientific Review*, *The Saturday Review*, *The Natural History Review*, and the weekly *Reader* to promote their views.

<sup>16</sup> See Meyers for the history of popularizing thermodynamics in the nineteenth century.

newspaper sellers” who “dealt their wares from the gutter” (59), the same destination for the discarded ink.

Rotting print does not simply fill Conrad’s London; it is also a part the city itself: “It was a raw, gloomy day of the early spring; and the grimy sky, the mud of the streets, the rags of the dirty men, harmonised excellently with the eruption of the damp, rubbishy sheets of paper soiled with printers’ ink. The posters, maculated with filth, garnished like tapestry the sweep of the curbstone” (59). The dirty “eruption” of scientific naturalism through print culture is also tied to the Professor’s cherished detonator. Partly chemical, mechanical, and biological, the detonator and the bomb to which it is attached rely on “the principle of the pneumatic instantaneous shutter for a camera lens” (49). The revolutionary photographic technology of the mid-nineteenth century that allowed the scientific naturalists to present their work for their audiences’ empirical consumption is here a part of the entropic decay of *The Secret Agent*’s plot and its continuous disruptions. As Adam Parkes explains, “The Professor’s bombs . . . evoke a more specific metaphor for the design of Conrad’s novel: the narrative itself is an infernal machine designed to obliterate any vestige of organic wholeness or unified identity, including its own” (125). Conrad’s decision to design the detonator using camera technology suggests that he is juxtaposing the detonator’s literal ability to cause an explosion alongside photography’s figurative ability to do the same in society. Nevertheless, photography is not responsible for Verloc’s ultimate downfall; the ink on Stevie’s collar is what leads the police to his shop and catalyzes the events leading to his murder.

As several critics have argued, Conrad is highly critical of the mass proliferation and consumption of printed material in the latter half of the nineteenth century. Michael A. Matin, for instance, observes “Conrad’s gestures of antipathy” in *The Secret Agent* “towards a mass reading

public which he believed to be composed of philistines” (264). The pervasive influence of scientific naturalism in the novel’s “ether-led” London, however, suggests that Conrad’s frustration with both journalists and their audiences is linked to the proliferation of science in print and its ability to shape the mindset of the bourgeoisie. For him, the sensationalism of the new journalism has disillusioned British society, but even more disturbing is that the sources of information are at best misguided and at worse corrupt. As Inspector Heat realizes, “the papers . . . appeared to him by a sudden illumination as invariably written by fools for the reading of imbeciles” (154). Ossipon and the patroness fit the description of these “imbeciles” through their unquestioning, pious devotion to the pursuit of knowledge, as does the rest of the population as they live in a modern city and believe that science has granted them such material prosperity. They are all, then, exemplars of what Ossipon describes at the end of the novel as “the mystery of the human brain pulsating wrongfully to the rhythm of journalistic phrases” (227). In Conrad’s London, print and the scientific views it promotes provide the rhythm for society and England’s intellectual currents as many citizens strive for a better understanding of truth.

For Conrad, print culture has enabled the fabrication of realities that are strategically deployed in society by entities like the scientific naturalists for political and financial reasons, resulting in a haphazardly woven together textile of biased perspectives. Conrad perhaps had this idea in mind as he lamented the dominant scientific model of the universe as an impersonal “knitting machine” in his 1897 letter. He decries, “It knits us in and it knits us out. It has knitted time space, pain, death, corruption, despair and all the illusions—and nothing matters. I’ll admit however that to look at the remorseless process is sometimes amusing” (*CL* 1: 425). The scientific naturalists and the different modalities of their mathematical logic all partake in this

“knitting” of reality into a “quilt of knowledge” that they then own and control. In Conrad’s view, the print industry also contributes to this way of thinking. Rather than knitting human reality into existence, however, the printing press prints human reality into existence through the content of the material it produces, content that has the power to influence society and determine the public reception of events and ideas. In *The Secret Agent*, when Vladimir remarks of most terrorists acts that “[e]very newspaper has ready-made phrases to explain such manifestations away” (24), and Heat claims that the public’s understanding of Michaelis’s possible arrest “depended, of course, on the newspaper press” (84), they are hitting on the idea that print possesses the ability to define and control phenomena before they even occur.

## 2.5 Scientific Moral Systems in *The Secret Agent*

Conrad’s association in *The Secret Agent* of the scientific naturalists’ use of print with London’s cultural decay encompasses also the novel’s depiction of morality, a third theme that is inextricably linked to scientific epistemology and print. Although he emphasizes in his letters that his main goal for *The Secret Agent* was the ironic treatment of his subject matter, Conrad does admit that it may “have some moral significance” (CL 3: 371). Indeed, after Verloc’s plot goes awry and Stevie dies, Verloc ruminates that Vladimir’s aim in ordering the terrorist act was not “the knocking down of a wall” but rather “the production of a moral effect” (173).

Expanding the scope of his ironic project, Conrad interrogates and ultimately deconstructs a variety of moral systems derived from scientific naturalism as he continues to repudiate the movement’s cultural imperialism.

In using books and periodicals to disseminate their worldview, secularize science, and stigmatize the work of amateur and clerical practitioners, Huxley, Tyndall, Galton, and Clifford became embroiled in a debate with prominent religious figures over whether science could

replace religion as the cultural authority on morality. If the scientific naturalists were to increase their prestige in society and promote their materialist-empirical epistemology as the truth, then they inevitably had to confront the authority of religion, which had long served as the source of truth and cultural values in British society. The idea that scientific naturalism could provide a more authentic form of morality derived from the objective study of nature instead of Scripture had been a part of its message since it emerged on the cultural scene in mid-century. As Huxley proclaims in “On the Advisableness of Improving Natural Knowledge,” first published in the *Fortnightly*, “I say that natural knowledge, seeking to satisfy natural wants, has found the ideas which can alone still spiritual cravings. I say that natural knowledge, in desiring to ascertain the laws of comfort, has been driven to discover those of conduct, and to lay the foundations of a new morality” (31-32).

According to Anne Dewitt, Huxley’s attempt to forge a new morality through the acquisition of natural knowledge amounted to elevating scientific naturalism to the status of a religion. She explains, “Huxley transforms science into a spiritual practice in which the student develops reverence for nature while relinquishing preconceptions and adopting a humble attitude. Scientific study, in his representation, becomes a moral training” (21). Dewitt observes that Huxley even described the epistemological movement of which he was a part as a “New Reformation,” and Tyndall went so far as to compare himself to Martin Luther (34). The scientific naturalists thus saw themselves as cultural revolutionaries who had an obligation to wrest moral authority away from the clergy. Claiming that they alone could properly perceive and interpret the moral implications of the impersonal forces governing the universe, the scientific naturalists presented themselves as experts in possession of specialized knowledge that they could use to lead society into a new moral epoch free from theology.

Along with several other of the scientific naturalists, especially Hooker, Spencer, and Tyndall, Huxley actively utilized various print venues to challenge the clergy and adherents to a theological model of science over the question of moral authority. Among his most prominent opponents were Bishop Samuel Wilberforce, William Gladstone, Reverend Henry Wace, and Bishop William C. Magee, each of whom openly criticized the arrogance of the scientific naturalists and their attempts to secularize the universe. Many of the articles Huxley published that engaged with these figures appeared in the *Nineteenth Century*, where his friend James Knowles was still editor. The titles of a few of these pieces are enough to give an idea of their content: “The Interpreters of Genesis and the Interpreters of Nature” (1885), “Mr. Gladstone and Genesis” (1886), “The Evolution of Theology: An Anthropological Study” (1886), “Science and the Bishops” (1887), “Agnosticism” (1889), “Agnosticism: A Rejoinder” (1889), and “Agnosticism and Christianity” (1889).

One of Huxley’s most historically significant articles that also provides a crucial link to Conrad and *The Secret Agent* is “Science and Morals” (1886). Published in the *Fortnightly* the same year that *The Secret Agent* is set, “Science and Morals” was Huxley’s response to lawyer and Catholic apologist William Samuel Lilly’s accusation that the secular worldview of scientific naturalism was causing the moral decay of society. In an important letter from October 1923, written about a month after he discussed the “Greenwich Bomb Outrage” and *The Secret Agent* with anarchist Ambrose Barker (*CL* 8: 165), Conrad states that he “had always a certain sympathy” for Lilly’s writings (*CL* 8: 191). The proximity of these topics—the bombing, the novel, and Lilly—in Conrad’s thought even after the sixteen years since *The Secret Agent* was published suggests more than a coincidental relationship. In my view, this novel is a manifestation of Conrad’s sympathy for Lilly’s writings as he pushes back against the cultural



imperialism of science. If Huxley published “Science and Morals” in 1886 as a response to Lilly’s attack on scientific naturalism, then Conrad is possibly rebutting this response, retroactively joining the debate, by setting *The Secret Agent* also in 1886, even though the historical event on which it is based occurred in 1894. After writing “Science and Morals,” Huxley further expounded his scientific view of morality in opposition to religious figures like Lilly in “Evolution and Ethics” and “Evolution and Ethics: Prolegomena,” which is the text that scholars most frequently associate with Conrad’s work. Through their writings in the last two decades of the nineteenth century, Huxley and the others developed moral positions derived from science and logic instead of religion as they continued to publicize the epistemology of scientific naturalism and their professionalizing goals.

In *The Secret Agent*, Conrad blends morality with the other dominant themes of scientific naturalism and print culture to create a more holistic picture of print’s ability to influence British society. Through his depictions of Ossipon, Michaelis, and the Professor, Conrad uses humor and hyperbole to expose scientifically-derived moral systems and their religious adornments as equally superficial as any other form of discourse that claims to be absolute. Each of these three characters expresses a set of beliefs that contribute to what Conrad described as “the moral squalor of the tale” (“Author’s Note” 228). Ossipon most obviously derives his moral sense from a material-empiricist worldview and elevates it to a religious status, a dynamic best evinced in the scene after he learns that Winnie murdered Verloc. Believing himself to be “free from the trammels of conventionally morality” (217), Ossipon studies Winnie’s features so that he may use his knowledge of criminal anthropology to ascertain her type, “invoke[ing] Lombroso as an Italian peasant recommends himself to his favourite saint” (217). The only reason that Ossipon does not “recommend his terrified soul to Lombroso” is because “on scientific grounds he could

not believe that he carried about him such a thing as a soul. But he had in him the scientific spirit” (217).

Ossipon’s “scientific spirit” represents the secular merger of science and aspects of religion within scientific naturalism as its spokespeople strove to establish themselves as cultural authorities on issues of truth and morality. In his book *Dying to Know: Scientific Epistemology and Narrative in Victorian England*, George Levine provides a useful framework for understanding the nuances of Conrad’s critique of scientific morality in *The Secret Agent* through his analysis of the nineteenth-century epistemological narrative of “dying to know.” Levine explains that the rise of the material-empiricist worldview encouraged the notion that acquiring knowledge required a complete effacement of the self before nature so that it could be studied as objectively as possible. He points out that dying to know demands “a passion for knowing so intense that one would risk one’s life to achieve it,” as well as “a willingness to repress the aspiring, desiring, emotional-ridden self and everything merely personal, contingent, historical, material that might get in the way of acquiring knowledge” (2). The dying-to-know narrative resonated strongly with scientific naturalists like Huxley and Tyndall because it rejected the same subjective and metaphysical elements they were trying to remove from science. Levine observes that the scientific practice of self-abnegation before nature as a material object of study implied a certain sense of moral authority that brought it into conflict with religion. According to him, the efforts of the scientific naturalists to displace religion largely depended “on this (proclaimed) willingness to suffer the consequences of finding out that the world is not only not made for us, but that it may well be without intention, meaning, or direction” (4). In a way, objective scientists become martyrs for the knowledge they seek, prostrating themselves before whatever laws nature may reveal and accepting their indifference to humanity. As Levine

explains, “Facing the amorality of the world entailed, so the implication went, a higher morality than that of traditional religion” (4). As the scientific naturalists made their arguments for professionalization and moral authority in print, they relied heavily on the narrative of dying to know to present themselves as objective guarantors of truth who alone could conduct science properly and explain its cultural implications to society.

Like Ossipon, Michaelis also embodies the “scientific spirit” of the era and enacts the dying-to-know narrative as he goes about penning his morality-themed memoir, “Autobiography of a Prisoner.” While his nickname, the “ticket-of-leave-apostle,” already establishes a religious dimension, Conrad pushes the association even further by depicting Michaelis’s lifestyle since leaving prison as that of an ascetic priest who has relinquished all worldly pleasures to clearly perceive the truth of what he writes. Living with his patroness on a diet of “raw carrots and a little milk” (221), he sits, as the narrator describes, fitted “with painful tightness into an old wooden arm-chair” due to his obesity in conditions that include “confined space, seclusion, and solitude,” which make his situation “like being in prison” (88). With all material distractions removed, Michaelis writes as if he is an apostle and may acquire through the process a measure of spiritual transcendence: “He could not tell whether the sun still shone on the earth or not. The perspiration of the literary labour dropped from his brow. A delightful enthusiasm urged him on. It was the liberation of his inner life, the letting out of his soul into the wide world” (89). Ever ironic, Conrad’s narrator cheekily remarks that Michaelis’s religious asceticism is financially motivated: “And the zeal of his guileless vanity (first awakened by the offer of five hundred pounds from a publisher) seemed something predestined and holy” (89).

The few comments that Conrad provides about the content of Michaelis’s book signal a purposeful connection with the moral system that Huxley propounds in the widely-influential

“Prolegomena” to “Evolution and Ethics,” both of which were published in essay form contemporaneously with Conrad’s first short stories. John Glendening, among other scholars, has examined the similarities between Conrad’s early fiction and the “Prolegomena” to argue that they “are pronounced enough to suggest that it had a direct influence on him” (156). Conrad does not abandon his interest in the “Prolegomena” after the early stage of his writing career, however, and I argue that he addresses this essay through Michaelis in *The Secret Agent* as part of his critique of the scientific naturalists. In the novel, the Professor offers this description of Michaelis’s authorial intentions: “He is elaborating now the idea of a world planned out like an immense and nice hospital, with gardens and flowers, in which the strong are to devote themselves to the nursing of the weak” (221). Michaelis’s moral system is therefore founded on the idea that civilization should function as a refuge from the merciless forces beyond its borders. Rather than enacting a form of natural justice on the weak, the strong should use their power to care for and protect those less able. Such a moral system bears heavy Christian connotations, as the titles of Michaelis’s three sections further evince: “Faith, Hope, Charity” (221). The novel does not state or imply that Michaelis is in any way religious, so his decision to use these labels in his autobiography suggests that he is trying to borrow the cultural authority of religion to legitimize his moral philosophy.

The presence of a garden in Michaelis’s hospital-model of civilization and his moral system’s overall altruistic trappings are ideologically similar to Huxley’s “Prolegomena,” in which he analogizes moral civilization to a garden. According to Huxley, the universe is ruled by the “cosmic process,” the characteristic feature of which “is the intense and unceasing competition of the struggle for existence” (13). Since Darwinian evolution, a cornerstone of scientific naturalism, mandates that only the fittest survive, the cosmic process ensures that the

weak die while the strong live and reproduce. Huxley argues that while human beings are a product of the cosmic process, we have evolved to understand that forming social bonds among us “improves the chances of society, as a corporate whole, in the cosmic struggle” (35), thus giving rise to what he calls the “ethical process.” Humanity enacts the ethical process separate from and in opposition to the cosmic process in a carefully cultivated and controlled garden-model of society protected from the impersonal brutality of nature. In Huxley’s garden, humans care for each other as they do in Michaelis’s hospital without regard for natural fitness, resulting in the building of social bonds and the strengthening of the species. Whether the system is labelled a hospital or a garden, Michaelis and Huxley follow the same formula with their moral philosophies. By expressing Huxley’s moral views in *The Secret Agent* through a morbidly obese, financially inspired ex-convict, Conrad is poking fun at the self-proclaimed authority of science to present a viable alternative to religion.

Among the scientific naturalists, Huxley was arguably the most humanist with his moral system. Others like Tyndall viewed morality as inseparable from the laws of Darwinian evolution and the forces of nature, meaning that inevitably the strong would rise above and suppress the weak. Conrad articulates this alternative form of scientific morality in *The Secret Agent* through the Professor, whose name already alludes to the professionalization efforts of the scientific naturalists. While Michael Whitworth has pointed out that the Professor’s “coldness is stereotypically that of the scientist” (72), a stereotype for which, I would like to add, Huxley, Tyndall, and the others were largely responsible, the correlations extend further, encapsulating not only the contemporary image of the popular scientist, but also the ways that the scientific naturalists sought to efface themselves before nature and promote their moral views as a secular religion. A significant point of connection may be found in the Professor’s background, which

presents distinct similarities with the likes of Huxley and Tyndall. The narrator explains that the Professor was born of “humble origin,” and his imagination was “fired early by the tales of men rising from the depths of poverty to positions of authority and affluence” (60). Unlike wealthier practitioners of science like Darwin, Huxley and Tyndall were born into poor families and rose to prominence through their own diligence, eventually holding multiple high-ranking positions in the scientific and university communities.

Additionally, as with the scientific naturalists, the Professor dedicates himself to maintaining the utmost degree of objectivity and the dying-to-know narrative, believing that they grant him an augmented moral sense. Armed with the “almost ascetic purity of his thought, combined with an astounding ignorance of worldly conditions,” as the narrator describes, he adopts “a goal of power and prestige to be attained without the medium of arts, graces, tact, wealth—by the sheer weight of merit alone” (60). Raised by a father who “had been an itinerant and rousing preacher of some obscure but rigid Christian sect,” the Professor has rejected what he sees as the cheap sentimentality of Christian morality in favor of something like Huxley and Tyndall’s “New Reformation,” a scientific morality that maintains authoritative religious connotations: “once the science of colleges had replaced thoroughly the faith of conventicles, this moral attitude translated itself into a frenzied puritanism of ambition. He nursed it as something secularly holy” (60). Indeed, “He was a moral agent—that was settled in his mind” (60).

Conrad’s depiction of the Professor’s secular moral philosophy revolves around the concept of force, and it has strong parallels with Tyndall’s own moral views. For the scientific naturalists, the only real forces in the world were the forces of nature that worked through

individuals and social institutions.<sup>17</sup> As the most open and unabashed materialist of the group, Tyndall especially attracted significant ire from the religious community, which accused him of advocating an amoral, atheistic worldview. While his Belfast Address of 1874 was a landmark in the cultural controversy between science and religion, Tyndall's 1877 address, published as "Science and Man" in 1892, was considered even more dangerous because it argued against the existence of the soul and emphasized impersonal force as the foundation of morality. He expresses the latter notion succinctly in the conclusion to the address, while also identifying what he sees as the waning power of religion: "There is on all hands a growing repugnance to invoke the supernatural in accounting for the phenomena of human life; and the thoughtful minds just referred to, finding no trace of evidence in favour of any other origin, are driven to seek in the interaction of social forces the genesis and development of man's moral nature" (372).

For the scientific naturalists, the most powerful and relevant force of nature in the conduct of society was Darwinism, a concept to which the Professor clings in condemning "conventional morality" (51). If Michaelis dreams of a society protected from Huxley's cosmic process, then the Professor dreams of a society in which the cosmic process reigns supreme, a world, as he puts it, "where the weak would be taken in hand for utter extermination" (222). Labelling the weak the "source of all evil on this earth," the Professor proclaims to Ossipon, "Exterminate, exterminate! That is the only way of progress. It is! Follow me, Ossipon. First the great multitude of the weak must go, then the only relatively strong" (222). When Ossipon asks who will then remain, the Professor responds, "I remain—if I am strong enough" (222). The Professor falters in his arrogance as he concludes, and, in direct parody of his Darwinian beliefs, the narrator notes his "large ears, thin like membranes" (222), indicators of Lombroso's criminal

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<sup>17</sup> As John Stuart Mill put it, "In sober truth, nearly all the things which men are hanged or imprisoned for doing to one another are nature's everyday performances" (28).

type that signal the Professor is a degenerate (Sherry 275). Nevertheless, armed with his cherished bomb, he proclaims, “And yet *I am* the force” (222). Conrad here caricaturizes the scientific naturalists’ emphasis on force, especially in relation to conceptualizing moral systems. The Professor, of course, never detonates his bomb, and he is unlikely to ever do so, for the act of testing his detonator would cause him to confront the implications of his glorification of force and the dying-to-know narrative in the most literal of ways.

## 2.6 Conrad’s Embroidery of the Unknowable

Although their conclusions vary, Ossipon, Michaelis, and the Professor each articulate a secular moral system in *The Secret Agent* derived from a scientific interpretation of reality. These moralities are narrative enactments of ideas that were being disseminated throughout England at the end of the nineteenth century as part of the scientific naturalists’ efforts to claim cultural authority over religion. For them, these forms of morality followed logically from the laws of causality and determinism that governed the universal “knitting machine.” During my earlier discussion about Conrad’s knitting-machine metaphor, I pointed out that he paints this mechanistic view of reality ironically, as he does in *The Secret Agent* through his depictions of various manifestations of scientific naturalism’s mathematical logic. An additional aspect of this letter is now relevant to begin staging my interpretation of Conrad’s attempt to express a counter-epistemology to scientific naturalism in *The Secret Agent*.

In Conrad’s critique of the knitting-machine model of reality, he introduces an alternate perspective that adopts embroidery as its central metaphor. His 1897 letter continues, “I feel it ought to embroider—but it goes on knitting. You come and say: ‘this is all right; it’s only a question of the right kind of oil. Let us use this—for instance—celestial oil and the machine shall embroider a most beautiful design in purple and gold’. Will it? Alas no. You cannot by any



special lubrication make embroidery with a knitting machine” (*CL* 1: 425). Conrad’s concept of embroidering opposes the mechanistically-determined process of knitting; it represents something indeterminable and uncertain beyond the knitting-machine’s ability to explain or create. Although machines could technically embroider certain pre-established designs by this time, I contend that Conrad is juxtaposing art, the original open-image embroidery, and industrial design, perhaps against the textile industrialist William Morris, whom Conrad mentions thinking about to Edward Garnett three days after he wrote the knitting-machine letter (*CL* 1: 428). In a way, knitting and mass-produced design objects are predetermined; in contrast, art and non-industrial embroidery are the effects of inspiration that ultimately cannot be known. When the knitting-machine is perceived as a symbol for scientific naturalism’s mechanistic view of the universe and process of coming to know, Conrad’s notion of embroidery indicates that he is conceiving of something outside of this worldview that cannot ever be produced without a complete reevaluation of the machine itself.

Another difference between knitting and embroidering that is significant to my reading of *The Secret Agent* is the gender dimension. While knitting was quickly assimilated into the masculine world of industry, embroidery was usually considered a feminine activity both professionally and recreationally. Despite much of *The Secret Agent* being a part of Conrad’s masculine knitting-machine or a product of its processes, he uses the scene describing Winnie’s murder of Verloc to experiment with what his notion of feminine embroidery might look like in narrative form. In his “Author’s Note,” Conrad emphasizes that he is “telling Winnie Verloc’s story” (233), thus positioning her at the center of the text alongside the epistemology of scientific naturalism and setting up an encounter between “embroidering” and “knitting.” Expressing this dynamic, however, was problematic for Conrad as he wrote the final part of the novel. He

described to J. B. Pinker, his agent, in 1906 that “the end is difficult since it just consists in extending that same ironic treatment to the bringing about and the very execution of the final murder (of Verloc by [Winnie])). I tell you it’s no joke—not to me at any rate” (CL 3: 365).

Although most of *The Secret Agent* may be read as a parody of the scientific naturalists’ certainty regarding their worldview, this letter suggests that Winnie’s act must be read differently to determine its value in relation to novel’s overall project. Because of its importance, the murder scene remained Conrad’s central concern as he pushed to finish writing. He wrote to Pinker in 1907, “It is the last third of the story that wants expanding, writing up, making effective” (CL 3: 437). These letters show that Conrad was struggling to express Winnie’s significance. While embroidery requires a machine other than one that knits, so also does Winnie’s scene require a type of logic other than that which defines the rest of the novel.

The scene depicting Winnie’s murder of Verloc is unique in *The Secret Agent* because Conrad tries to remove her from the purely mathematical logic that reigns throughout the novel’s “ether-led” London. Rejecting notions of causality and determinism, this scene probes the possibility of an uncertain and indeterminate epistemology derived from a relationship with that which is unknowable. Conrad prepares the scene to be read in this manner earlier in the novel when the narrator remarks that Inspector Heat’s “wisdom was of an official kind” that overlooks “sudden holes in space and time” (63). This quote is often used to argue that Conrad rejects the absolutism of objective time, represented in the novel by Greenwich Meridian, and demonstrates instead that time is experienced subjectively relative to varying conditions. John G. Peters, for example, argues that *The Secret Agent* shows that “any attempt to organize time into a systematic entity is merely an act of convenience, not an actual representation of the workings of time nor a demonstration that time is anything but a relative phenomenon” (420).

My interpretation of Conrad's discontinuous version of space and time places it in contrast to the scientific naturalists' view that space and time were continuous and therefore ultimately knowable. Unable to perceive holes in space and time, Heat's "official" wisdom is also the official wisdom of *The Secret Agent* that has produced the different understandings of truth and morality that I have examined in the novel. That which is situated outside space and time is fundamentally unknowable from this perspective because it cannot be subjected to the material-empiricist gaze and mathematical logic that enable the production of knowledge. Through his description of Heat's wisdom, Conrad opens the possibility for an unofficial form of wisdom that would *not* overlook holes in space and time, one that would acknowledge them and accept their influence on that which is situated in space and time. He thus gestures toward a different way of knowing—an act of embroidering as opposed to knitting—that Arkady Plotnitsky would label "nonclassical." Plotnitsky describes classical epistemologies, such as scientific naturalism, "as considering their principal objects available to conceptualization and, often, to direct representations in terms of particular properties of these objects, their behaviour, and the relationships between them" (1). Nonclassical approaches to knowledge, such as quantum theory, investigate that which is "beyond any knowledge or even conception, while, at the same time, affecting what is knowable" (xiii). Plotnitsky's differentiation between classical and nonclassical theories provides a tool to better understand the radical thinking that underlies Conrad's juxtaposition of knitting and embroidering as it unfolds in *The Secret Agent's* murder scene.

When Heat visits Verloc to inform him that his responsibility for the bombing plot is known to the police, Winnie overhears that Verloc used Stevie, her brother, to deliver the bomb and inadvertently caused his death when Stevie tripped and prematurely detonated the device.

The following conflict between Verloc and Winnie explores the possible interaction between the classical wisdom of Victorian England and a nonclassical hole in space and time. After Heat leaves, Verloc's failure is presented as an act of overconfidence in the certainty of determinism and the knowledge it allows. While reviewing the events leading to Stevie's stumble, Verloc grows frustrated because he "had foreseen everything but that" (169). Indeed, the "unexpected march of events had converted him to the doctrine of fatalism" (170). Despite his best efforts to plan every detail of his plot, Verloc overlooked the presence of their address that Winnie had inked in Stevie's collar, the clue that quickly led the police to their home. Maintaining a connection with the scientific naturalists and their use of mathematical logic to make their predictions, the narrator relates of Verloc, "In all the eventualities he had foreseen Mr Verloc had calculated with correct insight on Stevie's loyalty and blind discretion" (173). Verloc's "calculations" continue as he applies "his mind with ingenuity and forethought to the problems of the future" and ruminates on his knowledge of being a secret agent (182), which "augured well for the success of his plans and combinations" (183). Although Verloc's overconfidence in his ability to predict and plan the future led to Stevie's death, he immediately begins conceptualizing the "few years of quiet life before them both" once his prison term is done (184).

While Verloc's predictive approach to the situation aligns with the classical epistemology of scientific naturalism, the shock of realizing her husband's deed effectively displaces Winnie from the realm of causality and determinism to a nonclassical modality of being, a hole in space and time. If the purpose of Verloc's plot was to shock the bourgeoisie through the "production of a moral effect" (173), then he may safely be said to have failed. Nevertheless, the narrator describes that the event succeeds in having a powerful moral effect on Winnie: "But this creature, whose moral nature had been subject to a shock of which, in the physical order, the

most violent earthquake of history could only be a faint and languid rendering, was at the mercy of mere trifles, of casual contacts” (187). Conrad here provides a key moment during which he acted as “an extreme revolutionist” while composing the novel (“Author’s Note” 232). George Levine argues that Conrad’s revolutionary nature is most evident when he sets up a certain way of thinking—such as the classical manner through Verloc, as I have shown—only to draw attention to its inadequacies and propose something radically different:

Adapting the conventions of realism in order to expose their arbitrariness, Conrad nevertheless posits a reality beyond language from which his fictions protect him. That reality is, indeed, revolutionary, in the sense that it is governed not by regularities, but by irrationalities, by forces incomprehensible to human consciousness, and violently threatening. (*Darwin* 267)

Conrad’s speculation about holes in space and time in *The Secret Agent* evinces his concern with the irrationalities and incomprehensible forces that reside beyond language and seem to threaten the epistemological certainty that classical ways of knowing allow. By acknowledging these discontinuities and pondering their effects on knowledge and human experience, Conrad is trying to present a revolutionary reality in the sense that Levine describes, one that requires he think in nonclassical terms.

Conrad attempts his epistemological revolution after Winnie understands what Verloc has done. As she tries to process recent events, she becomes completely disjointed from the “ether-led” society of London. The narrator notes that she “began to look at herself as released from all earthly ties,” and that her “contract with existence, as represented by that man standing over there, was at an end” (185). Moreover, Winnie is labelled a “free woman” not once, but multiple times throughout the scene. While she sees herself as being free from Verloc, Winnie also

becomes free from the classical laws of logic and reason. Her personality is described as “torn into two pieces, whose mental operations did not adjust themselves very well to each other” (186), and her “mental form” assumes “an unrefined shape” (187). Winnie’s mind is out of joint, characterized by “insane logic” and “disconnected wits” that cause her to forget the locality of Stevie’s death and make her “like a masked and mysterious visitor of impenetrable intentions” (188). Light itself seems to collapse inside of Winnie, whose “tinge of wildness” is derived from “the fixity of her black gaze where the light of the room was absorbed and lost without the trace of single gleam” (190).

Removed from the novel’s official wisdom, Winnie now radically disrupts Verloc’s efforts to use it to appease and persuade her: “He advanced, and stretching out his hand, dragged the veil off, unmasking a still, unreadable face, against which his nervous exasperation was shattered like a glass bubble flung against a rock” (188). As the scene continues, the narrator increasingly deploys scientific diction such as “particle” and “force” to describe Verloc’s efforts, setting up a moment in which Winnie stands in contrast to the entire epistemological world surrounding her: “The waves of air of the proper length, propagated in accordance with correct mathematical formulas, flowed around all the inanimate things in the room, lapped against Mrs Verloc’s head as if it had been a head of stone” (191). Conrad’s revolutionary thought is remarkably poignant as he simultaneously identifies the limits of a material-empiricist worldview, posits that which is beyond it, and illustrates the possible interaction between them. His description of “waves of air of the proper length” that “propagate” alludes to ether, a cornerstone of scientific naturalism, and their movement “in accordance with correct mathematical formulas” is a jab at the scientific naturalists’ mathematical model of the universe and human behavior. Verloc’s appeals, however, have no effect on Winnie because in her

discontinuous mental state she resides in a nonclassical realm of uncertainty and irrationality that Verloc's classical thought cannot possibly comprehend.

The mention of mathematics in this scene also asks to be read alongside Vladimir's desire to "throw a bomb into pure mathematics." Although Verloc cannot complete this task, Conrad undertakes it through his representation of Winnie in this scene, which behaves as a microcosm for his holistic endeavor in *The Secret Agent*. Winnie's shock positions her within an unknowable hole in space and time, the same kind that Heat's "official" wisdom overlooks, thus making her immune to the mathematical logic of scientific naturalism that operates according to spatial-temporal continuities. For her during these brief moments, classical epistemologies do not apply, and, though they may be composed of "waves of air of the proper length" and founded on "correct mathematical formulas," they merely crash against her, failing to penetrate what she has become. After Winnie stabs Verloc, she even imagines that she has been outside the passage of time and only now does she return to its continuous flow: "She had become aware of a ticking sound in the room. It grew upon her ear, while she remembered clearly that the clock on the wall was silent, had no audible tick. What did it mean by beginning to tick so loudly all of the sudden?" (193-94).

## 2.7 Conclusion

Conrad's depiction of Winnie's exceptional situation demonstrates that he is probing the possibility of things beyond the rules of space and time and inaccessible to human experience that cannot be explained by classical ways of knowing like scientific naturalism. Despite his attempt to think in nonclassical terms, however, Conrad has moments during which he lapses into the very logic that he is trying to reject. When Winnie stabs Verloc, for instance, the narrator describes that she put "all the inheritance of her immemorial and obscure descent" into the blow

(193), thus suggesting evolutionary linearity. Yet such instances do not derail Conrad's overall project; rather, they are simply indicators of his time and the epistemological and linguistic tools available to him. His challenge in writing Winnie's scene is like that of Ossipon, who laments at one point, "How am I to express myself? One must use the current words" (53). Due to their efforts during the Victorian era, the scientific naturalists were responsible for shaping contemporary discourses dealing with truth and morality and providing the language and logic with which society was supposed to speak about such issues, a framework from which Conrad could not fully free himself. Nevertheless, through his ironic treatment of the reigning form of scientific thought in Victorian England, Conrad complicates its material-empiricist worldview and undermines its spokespeople's attempts to claim cultural authority over the clergy. By writing a novel about nineteenth-century science for a turn-of-the-century audience, he provides a cautionary tale to society about employing science to justify absolute systems of knowledge and morality even if they are free from religion.

Conrad's *The Secret Agent* also represents a unique point in the transition between Victorian science and the new physics of the early twentieth century because it experiments with a type of knowledge that acknowledges that which is beyond knowledge. While Conrad may have felt as if he lacked an "embroidering machine" or—what amounts to the same thing—the proper artistic language to express himself, he tries to articulate through *The Secret Agent* what such a radically different way of knowing could look like. In the process, he provides a crucial landmark for understanding the epistemological shift in both science and literature underway at the beginning of the twentieth century.



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## CHAPTER 3.     **EARLY MODERNIST PERIODICALS AND THE SCIENCE OF FEMINISM, POETRY, AND PROSE**

### 3.1   Introduction

This chapter examines several representative early-twentieth-century British periodicals to trace the development of early modernist theories of feminism, poetry, and prose as they matured alongside and engaged with shifting scientific discourses. Recent scholarship in modernist studies has dispelled the myth that modernists completely rejected the veneers of a rising mass culture and the exploding print industry.<sup>18</sup> Mark S. Morrisson observes that since the publication of Andreas Huyssen's landmark work *After the Great Divide* (1986), which firmly separated modernism from mass culture, modernist studies has entered a new domain in which reciprocal relationships between authors and mainstream society are being discovered and explored. Current research, Morrisson explains, is "challenging the commonplace of modernism's inveterate antagonism to mass culture and portraying modernists as more savvy about self-promotion and audiences than had previously been understood" (5).

While many of the early modernists condemned the sensationalism of mass culture that emerged from the intensification of capitalism in the late-nineteenth and early-twentieth centuries, they also identified the seeming ubiquity and growing influence of print as an opportunity to interact with mass culture and promote their new aesthetic forms. Faye Hammill and Mark Hussey point out that "[p]rint was on the move throughout the modernist period," and many authors perceived that a book could now transcend its materiality and "be manipulated as part of the experimentalism by which modernism was initially defined" (2). Surpassing even the utility of books, periodicals became a powerful, more financially viable tool for modernists to

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<sup>18</sup> For a few recent studies, see Cooper, Jaffe, and Wollaeger.

publish their work and make their arguments about modern aesthetics. These venues provided a means of articulating the diverse conversations and debates that took place among the modernists and their interlocutors, expressing, as Suzanne W. Churchill and Adam Mckible note, “multiple voices and perspectives, crossing disciplinary boundaries, and both resisting and engaging mass culture” (5).

In what follows, I build on the scholarship thus outlined to investigate the ways in which popular conceptions of scientific methodology and rhetoric derived from mass culture influenced formative theories of the early modernist movement as they were expressed through *The Freewoman* (f. 1911), *The New Freewoman* (f. 1913), *The Egoist* (f. 1914), and *The Criterion* (f. 1922). Dora Marsden served as the progenitor for this sequence of periodicals, founding the *Freewoman* as a platform for expressing her views of feminism apart from the mainstream suffrage movement. When this venue closed and reemerged as the *New Freewoman*, Ezra Pound joined Marsden as a literary editor and used his influence to increase the prominence of literature, a shift in focus that prompted the *New Freewoman* to evolve into the *Egoist*. A crucial platform for the budding modernist movement, the *Egoist* added T. S. Eliot to its editorial ranks in 1917. This position granted Eliot a chance to learn from Marsden and Pound before he founded the *Criterion*. Reaching larger, more diverse audiences than its little magazine predecessors, the *Criterion* helped usher in the new stage of high modernism and institutionalize the movement in British society.

The lifespans of the *Freewoman*, the *New Freewoman*, the *Egoist*, and the *Criterion* overlapped with revolutionary changes in scientific discourse that influenced public perceptions of science and the cultural authority with which it was attributed. Over the first three decades of the twentieth century, a widespread interest in scientific vitalism gave way to the sensationalism



of Albert Einstein's theories of relativity. These exciting developments in science increasingly merged with mass culture as their presentation and use were appropriated for capitalist gain. Working amidst these changes, Marsden, Pound, and Eliot exemplify the type of "political and intellectual radicals" who identified elements of mass culture as "open[ing] up the possibility of oppositional space, even of counterpublicity and counterpublics" (Morrisson 9). Within the pages of the *Freewoman*, the *New Freewoman*, the *Egoist*, and the *Criterion*, they derived inspiration from popular treatments of scientific discourse as it transitioned from vitalism to relativity, cultivating in the process a radical synthesis of social, philosophical, and aesthetic perspectives that formed the foundation for early modernism.

Although Marsden, Pound, and Eliot all looked to science to advance their respective theories, they each forged a distinct relationship with it depending on their personal goals and visions for modernism. For Marsden, science provided first a framework through which she could conceptualize her form of feminism and then a means by which to legitimate her philosophical views. For Pound, the rhetoric and methodology of science provided a source of cultural authority from which he could borrow in his persistent efforts to facilitate modernism and garner respect for modernist authors and their work. Finally, for Eliot, working in an environment that Marsden and Pound helped create, science served as a worthy cultural adversary against which he could define his craft and that of the other high modernists. Although modernism emerged in the shadow of science's cultural prestige, Marsden, Pound, and Eliot ensured that the movement did not sacrifice its cultural independence to mass trends of presenting and using science, and they managed to establish a tenuous accord with science that would eventually allow modernism to achieve equal social status.

### 3.2 Dora Marsden's Vitalistic Feminism

Prior to her work in periodicals, Marsden developed a relationship with contemporary scientific discourse through which she expressed a tenaciously individualist form of feminism. By the end of the nineteenth century, the material-empiricist worldview that was embraced among the scientific naturalists during the heyday of their prestige in the 1860s and 70s ceded to a new discourse centered on invisible forces. Rather than emphasizing the observation and study of nature, science became more interested in exploring the unseen energies that flow in and through its composite elements.<sup>19</sup> A few notable names and discoveries contributed to these changes and encouraged the spread of certain ideas about the nature of reality and human experience that shaped Marsden's feminist vision. From about 1820 to the mid-1870s, Michael Faraday and then James Clerk Maxwell would co-invent and develop electromagnetic theory, demonstrating that electricity and magnetism belong to same continuum of force. Along with William Thomson (later Lord Kelvin), Maxwell would also statistically reformulate the thermodynamic law of entropy to shed light on the operations of energy and molecules. Other major events include Wilhelm Röntgen's discovery of X-rays in 1895, French physicist Henri Becquerel's detection of radioactivity in 1896, which led to Marie and Pierre Curie's discovery of the highly radioactive element radium in 1898, and British physicist J. J. Thomson's use of cathode rays to discover the electron in 1897. According to Linda Dalrymple Henderson, these discoveries generated an immense amount of excitement and intrigue because they proved that an "invisible world beyond human perception was no longer a matter of mystical or philosophical speculation, but was now established empirically by science" (385).

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<sup>19</sup> In addition to their individual sources cited in-text, see Clarke and Henderson's edited collection *From Energy to Information* for more information on late-nineteenth- and early-twentieth-century science and its relationship to art and literature.

The new forces and energies that comprised an invisible world beyond the reach of empirical observation assumed a philosophical form in the doctrine of vitalism, which “states that in the world at large the forces that move matter about and the forces that produce and maintain living beings are completely different” (Clarke 28). Scientific vitalism emerged as a counter to the mechanistic view of the universe that placed all things, both animate and inanimate, within the same absolute schematic. Indeed, especially after the nineteenth-century discovery of cells in biology, all aspects of reality, even at the microscopic level, seemed to function like machines subject to inexorable laws of nature. Bruce Clarke explains that vitalism was “a scientific alternative to [this] mechanistic reductionism, drawing its initial sustenance from early modern chemistry at a time when chemistry rather than physics was the main field in which the phenomena of electricity and magnetism were being investigated” (30). As vitalism became increasingly popular in England around the turn of the century, the modernization of neuroscience and the discovery of brain cells indicated that life does, in fact, produce different forms of force and energy than inanimate matter. In 1907, Henri Bergson lent philosophical credence to vitalism when he coined the term *élan vital*, or “vital impulse,” in his book *Creative Evolution*. For Bergson, evolution necessitates an original common impetus that drives the emergence of all living species. Overall, vitalism promoted the idea that life was special; it was produced and maintained by forces and energies that were fundamentally different than those that determine the properties of all other matter.

Due to the prominence of vitalism, Clarke argues, the aesthetic logic leading “into modernism was implicitly an immaterial and energetic scientism patterned after the force fields and energy transformations of late-nineteenth-century electromagnetic and atomic physics” (5). Born and raised amidst this way of thinking, Marsden explored a vitalistic version of feminism

that rejected what she saw as the mechanistic workings of the mainstream suffrage movement in favor of a brand of feminism that embodied and expressed the unseen forces and energies that flow through all living things. The seeds of Marsden's feminism that she would articulate through the *Freewoman* and her subsequent periodicals may be seen in her work with the Women's Social and Political Union (WSPU), which was focused on women's suffrage in the early twentieth century. Before her break with the organization, Marsden was a prominent public speaker for the group, providing a keynote address at a large suffrage rally in 1908, and she was repeatedly jailed and force-fed along with other suffragists. She is perhaps best known, however, for hiding in the attic of the Southport Empire Theatre in 1909 so that she could hurl insults and propaganda down at the visiting Winston Churchill. Marsden's militant feminism was too extreme for the WSPU, and she resigned from the organization after being denounced by its leadership. This break marked a turning point in her life and career because it liberated her from the demands of a political organization and allowed her to explore her own version of feminism separate from the egalitarian vision of the WSPU.

Reflecting on the state of the suffrage movement, Rebecca West, Marsden's friend and colleague, later noted that Marsden's exit was crucial because "there was equally certainly a need for someone to stand aside and ponder on the profounder aspects of feminism" (5). Lucy Delap observes that Marsden was not alone in her frustration with the WSPU and the mainstream suffrage movement: many women found it too confining and political and sought greater independence to explore feminism on a more intimate level. As Delap describes, "The early articulation of a space outside of suffrage enabled activists and intellectuals to think about deeper issues, not just of public policy, but of personal, sexual and psychic liberation" ("Avant-garde Women and Women's Suffrage" 251). Situating herself within this space, Marsden turned her

attention to the study of philosophy and dedicated herself to employing the rapidly growing influence of periodical culture to more strictly formulate the vitalistic feminism that she exemplified in her own life.

Marsden founded her first periodical, *The Freewoman: A Weekly Feminist Review*, in 1911, serving as co-editor alongside Mary Gawthorpe, her former colleague in the WSPU, to explore an alternative model of feminism in which the vitalistic forces and energies of life could be free. Although suffrage was the main goal of early-twentieth-century feminism, the concept of “feminism” itself was not clearly defined, so the *Freewoman* had an opportunity to influence the development of modern feminism in its early stages. As Delap explains, the *Freewoman* “played an influential role in shaping ‘feminist’ identity in England and America, at a time when ‘feminism’ was a newly coined and relatively fluid term” (*Feminist Avant-Garde* 22). In the initial issue, Marsden clearly lays out her understanding of feminism by contrasting the mechanistic “Bondwomen” with the vitalistic “Freewomen,” sowing in the process the seeds of individualism and desire for aesthetic novelty and cultural liberation that would soon define the early modernist movement. She writes in a short piece titled “Bondwomen,” “Bondwomen are distinguished from Freewomen by a spiritual distinction. Bondwomen are the women who are not separate spiritual entities—who are not individuals. They are complements merely” (1). Marsden proceeds to lament that women have been relegated to a reactionary position in society, forced to define their identities according to cultural tradition. She proclaims, however, that “in the midst of all this there comes a cry that woman is an individual, and that because she is an individual she must be set free. It would be nearer the truth to say that if she is an individual she *is* free, and will act like those who are free” (1). For Marsden, feminism originates from within when women acknowledge their freedom and individualism in the face of society’s stifling push

for conformity. She argues, “Having this sense, they will learn that freedom is born in the individual soul, and that no outer force can either give it or take it away; that only Freewomen can be free, or lead the way to freedom” (2).

Marsden’s *Freewoman* and the vitalistic Freewoman she described quickly emerged as important elements in Anglo-American society and the feminist movement. Delap observes that Marsden’s timing with the journal was fortuitous because the environment in England was one in which “ideological divides were relatively porous with a rich cross-fertilization of ideas and discourse shared between periodicals, lectures and debates” (*Feminist Avant-Garde* 55). Having struggled with the rigid structure of the WSPU and its authoritarian attitude toward feminism, Marsden relished the discursive fluidity of periodical culture, which seemed to reflect contemporary scientific thought much more accurately than books, and sought to use her writing and editorial influence to incite dialogue on issues that many considered taboo. For her, the *Freewoman* was a means of resistance to not only the patriarchal oppression of both women and the vitalistic forces and energies that flow through them, but also what she saw as the ideological oppression of a radical feminism that would embrace such ideas. While other major periodicals active during this time such as Ford Madox Hueffer’s *The English Review* (f. 1908) and A. R. Orage’s *The New Age* (f. 1907) embraced a literary and aesthetic dimension, Marsden’s the *Freewoman* dealt almost exclusively with feminism and politics, leading one contributor by the name of G. R. S. Taylor to praise it as “a technical trade journal on Womanhood” (27).

As editor and regular contributor, Marsden adopted a comprehensive approach to exploring the different types of gender identities that varying modalities of vitalism could produce, ranging from spinsters and housewives to Uranians and advocates of free love. She also published and encouraged discussions about topics such as divorce, birth control, autoeroticism,

and sexually-transmitted diseases, among a range of other socially-repressed issues. Scattered throughout these articles were illustrated advertisements that subtly reinforced the *Freewoman's* feminist message of liberated individualism. In the first issue, for instance, while reading an article titled "The Psychology of Sex," audiences encountered a full-page advertisement for Farrows Bank for Women, which depicted a noble female figure with a bag of money around her neck, a globe inset with a bank on her shoulder, and books and ink at her feet. Advertisements such as these simultaneously publicized options to meet the needs of Marsden's Freewomen while also building a sense of solidarity among them as nonconformists. The *Freewomen's* audience, however, was not limited to women. In its pages, readers could also find articles written by critical thinkers of the era on a range of political and social issues, including "socialists, syndicalists, and anarchists such as H. G. Wells, Selwyn Weston, Upton Sinclair, Guy Aldred; writers devoted to open discussions of female sexuality, homosexuality, and birth control such as Charles Whitby and Harry Birnstingl; and feminist thinkers and activists such as Teresa Billington-Greig, Stella Browne, Rebecca West, and Ada Nield Chew" (Green).

Borrowing the philosophical implications of vitalism, Marsden's *Freewoman* and the other modalities of feminist expression that she explored in the *Freewoman* provided an alternative to the mechanistic reductionism that defined a material-empiricist worldview. While Marsden's thought had other philosophical influences, they each coalesced with her views of vitalism, providing different models for conceptualizing how unseen forces and energies could empower the individual to achieve a heightened level of subjectivity.<sup>20</sup> Throughout her contributions to the *Freewoman*, she reveals the influence of Hegel's Absolute Knowledge, Nietzsche's *Übermensch*, and Spencer's progressive, teleological model of evolution. Yet, for

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<sup>20</sup> See Clarke 1-46 for a more thorough discussion of Marsden's philosophical influences and their positions in early-twentieth-century British society.

Marsden, the most significant influence was Max Stirner's *The Ego and His Own* (1844), a work, translated into English in 1907, that had monumental importance in early twentieth-century England. Marsden's philosophical individualism was born from her views of feminism, but the subjectivity she envisioned through Stirner's ego was meant to transcend traditional notions of sex and gender, representing instead an androgynous "self" formed around an immaterial soul.

In an exemplary piece published in the *Freewoman* in 1912 titled "The Growing Ego," Marsden relies on Stirner's book, which she labels "the profoundest of human documents" (221), to formulate an anarchist conception of the ego in which the individual, enlightened and empowered through a relationship with vitalistic forces and energies, transcends all other laws and ideologies. She argues, "Morality, religion, God, and man are all brought low. They no longer rule as external powers influencing the Ego. To the Ego they are as his footstool. . . . The Ego is supreme, and reigns in his lonely kingdom" (222). According to Marsden, acquiring Stirner's version of subjectivity requires a remarkable strength of character and a desire to declare ownership of one's environment as belonging to the ego: "Only those rare, positive persons whom we call personalities dare claim their kingdoms and claim their own satisfactions. Personality is the living equation of genius" (222). Marsden's egoist form of genius is the product of intense self-reflection during which the individual becomes aware of the spiritual dimension of being that may acquire power through the force of will. As she contends,

As a quality [personality] stands for first-hand revelation of the nature of things in the soul of the individual. Translated into form, it is the work of art, great or less great, according to the degree of initial revelation. When a man has it, consciously, he cannot ignore it. He uses it, because it would burn his heart out did he not. He becomes a prophet, a revealer, a philosopher, or a poet. (222)



Marsden here demonstrates her view that the ego is the translation of vitalistic forces and energies into a distinct personality, one that is unique, powerful, and free. Significantly for early modernism, she believes that this process produces within the artist, author, and philosopher a passionate fire that must be employed to create or else the subject in which this ego arises risks its own destruction.

Due to the radical nature of the *Freewoman's* content, its sponsors formally announced that they would be rescinding their support less than a year after it first appeared. Continuing to adhere to her policy of openness with her readers, Marsden published the letter from W. H. Smith and Sons in one of the final issues. Therein, they stated, "we have come to the conclusion that the nature of certain articles which have been appearing latterly in THE FREEWOMAN are such as to render the paper unsuitable to be exposed on the bookstalls for general sale" ("Notice" 311). Although the *Freewoman* lasted for only one year, Marsden successfully expressed in its pages a form of individualist subjectivity derived from science that would serve as a precursor to the form, style, and content of early modernist poetry and prose. Cultivated within the discourse of vitalism, Marsden's *Freewoman* came to represent the embodiment of a unique, androgynous ego liberated from socio-cultural discourses and in possession of a distinct relationship to the forces that flow through all living things.

After the *Freewoman's* closure in 1912, the American author Floyd Dell regarded Marsden as important enough to add an additional chapter on her in his book *Women as World Builders: Studies in Modern Feminism* (1913). Situating her alongside other significant women of the time, including Charlotte Perkins Gilman, Beatrice Webb, and Emma Goldman, Dell explains that Marsden's cultural importance was tethered to the ways in which she practiced and lived the individualism she taught, inciting women and men alike to independent thought and

action: “Inevitably one argues with Dora Marsden. That is her value. She provokes thought. And she welcomes it. She wants everybody to think—not to think her thoughts necessarily, nor the right thoughts always, but that which they can and must” (103). For Marsden, Dell proclaims, freedom and strength are products of a pure soul and an exertion of will. According to him, “She stimulates her readers to cast out the devils that inhabit their souls—fear, prejudice, sensitiveness. She helps them to build up their lives on the basis of will—the exercise, not the suppression, of will. She indurates them to the world. She liberates them to life” (103). While her influence in 1912 cannot be overestimated, Dell observes that her true impact on early twentieth-century society will only be known in the future: “She sows in the fertile soil the dragon’s teeth which shall spring up as a band of capable females, knowing what they want and taking it, asking no leave from anybody, doing things and enjoying life—Freewomen!” (104).

Marsden reappeared on the periodical scene shortly after the *Freewoman*’s closure when she launched *The New Freewoman: An Individualist Review* in June 1913. While feminism served as a vehicle through which she could promote her individualist egoism in the *Freewoman*, Marsden strove to use her next periodical to dissolve completely the boundaries and limitations of sex and gender so that she could focus exclusively on the vitalistic energy of the androgynous individual. When the first issue of the *New Freewoman* was published, many of Marsden’s readers were confused about the journal’s aims, observing that the usual discussions of sexuality and female identities were absent. In her “Views and Comments” of the July 1, 1913 issue, Marsden sought to set the record straight: “If men and women would try to turn their attention away from the infinitesimally small differences which distinguish them . . . we should soon have heard the last of Man and Woman spelt with capitals, and the day of the individual would be at hand. And the measure of the individual would be not sex, but individual power” (24). As

several scholars have noted, the feminist currents of Marsden's discourse rapidly evolve into themes of anarchism and personal will, both of which maintain a connection with scientific vitalism. After attacking the concept of "Causes" and the existence of the "Woman movement" in the inaugural issue, Marsden states her vision for the new journal outright. With strong echoes of Stirner and Nietzsche, she proclaims, "Dear friends and readers, THE NEW FREEWOMAN has *no* Cause. The nearest approach to a Cause it desires to attain, is to destroy Causes, and for the doing of this it finds its reward and incentive in its own satisfaction. THE NEW FREEWOMAN is not for the advancement of Woman, but for the empowering of individuals" (25). In these poignant lines, Marsden combines the power of vitalistic forces and energies with Darwin's evolutionary theory, which is grounded in the idea that evolution has no ultimate cause or telos, to summarize her goal.

Marsden's shift in focus from the *Freewoman* to the *New Freewoman* opened the door for modernism to establish a foothold in British periodical culture. When Pound and Richard Aldington joined Marsden as editors, they used their growing influence to push the venue away from its original association with the feminist project of the *Freewoman* to a more aesthetic orientation. Marsden herself was less concerned with feminism in 1913, turning her attention instead toward developing her philosophical project of individualist egoism on a larger scale. The transitory state of the *New Freewoman*, however, was not a matter of patriarchal conquest over a traditionally feminist venue. According to Rabaté, "It was less that a male-centered modernism was replacing an older suffragism than a political review being slowly turned into a literary magazine" ("Gender and Modernism" 280). At the end of 1913, Pound and Aldington convinced Marsden to change the name of the *New Freewoman* to *The Egoist: An Individualist Review* to better represent the content and aims of the magazine. Early in 1914, Marsden

resigned as editor to focus on her own work and adopted the position of “contributing editor.” Shortly after, Harriet Shaw Weaver was named as editor. Reviewing Weaver’s biographical information, Susan Solomon observes that Weaver’s strict conservative Christian upbringing initially make her appear as a strange choice to lead an avant-garde liberal arts magazine. Yet, according to Solomon, Weaver was attracted to Marsden’s philosophical feminist work at the *Freewoman* and eagerly worked her way into the periodical’s administration: “She became a subscriber, joined the Discussion Circle, and quickly earned the trust and affection of Marsden while becoming honorary secretary of *The New Freewoman* and *The Egoist*. When Marsden chose to resign, Weaver, whose vision for the magazine resembled Marsden’s, appeared a natural successor.”

Although Marsden would continue to be a key player at the *Egoist*, her contributions would become increasingly isolated from the magazine’s literary goals. During this periodical’s run, she shifted her focus from articulating a radical form of feminist individualism derived from scientific vitalism to both critiquing lingering scientific concepts from the Victorian era and grappling with the philosophical implications of post-Newtonian physics. Marsden actively sought to understand the nuances of contemporary scientific developments and adapt her theories accordingly. After moving to the role of contributing editor, she dedicated her efforts toward more strictly formulating her philosophy in an extended series of essays that frequently headlined the *Egoist* from 1916 until the venue’s closure. First titled *Lingual Psychology* and then *The Science of Signs*, Marsden’s long, dense philosophical treatise articulates a scientific approach to semiotics, the ego, and the individualist soul that arguably prefigures Jacques Lacan’s theories of the Symbolic order. More important, however, are the ways that Marsden is attuned to the scientific and philosophical magnitude of developments in physics catalyzed by

quantum theory and relativity theory, both of which were still largely unknown in England at the time.

Perhaps the most remarkable revelation of Jeffrey S. Drouin's study on the *Egoist's* relationship with science is that "Marsden introduced ideas from Einstein, without citing him, in order to bolster her radical vision of renewal" (51). Drouin connects Marsden with Einstein via the metaphysician Samuel Alexander, Marsden's former professor and a strong inspiration for her philosophical work. Alexander already possessed a basic understanding of Einstein's theories of special and general relativity prior to their initial popularization in 1919, and he published one of the first theories of metaphysics based on relativity in *Space, Time, and Deity* (1920). According to Drouin, "Since her philosophy is heavily indebted to Alexander's, it is reasonable to infer that her familiarity with the relativity theories before their popularization came through correspondence, by attending lectures, and by reading his articles and early drafts" (54). Marsden's privileged exposure to Einstein and her central role at the *Egoist* make her an indispensable figure for understanding the effects of the new physics on philosophy and the development of the modernist aesthetics.

In a piece titled "The Constitution of the World and the Character of our Scientific knowledge" that appeared in the March 1918 issue of the *Egoist*, Marsden expresses doubt about the prevailing classical model of Newtonian physics. Anticipating the ideas that would soon shape quantum mechanics, Marsden targets the lingering Victorian disregard for metaphysical causality and the power that this material-empiricist worldview seemed to provide, both of which were already being thrown into question by early quantum theory, especially Niels Bohr's 1913 atomic theory. While she previously sought to distance herself and her philosophical goals from reductive "causes" in the inaugural issue of the *New Freewoman* in 1913, Marsden's

“Constitution of the World” expands beyond philosophy into the foundations of scientific knowledge, thus demonstrating a significant awareness of the overlap between the two disciplines. Marsden begins the article with this definition of scientific practice: “The task of science is to issue, under symbolic forms, authenticated classifications of the order of succession obtaining at any given stage in the flow of events in the external world” (33). Marsden thus perceives science as the act of grouping events together and then projecting causal relationships onto them that grant an “authentic” meaning derived from their relationship with authoritative scientific classification. The scientist’s reason for doing so, she argues, is simple: “Equipped with these, he can plough ahead with the work of observation on progressively intensive lines and so bring his command over Nature’s order to an ever-heightening degree of perfection” (33). According to Marsden, science seems to be primarily concerned with expanding the discipline’s command over nature, which it does by predicting the movements of things and the occurrences of events, ignoring in the process the metaphysical causality that would allow actual knowledge of those things and events. She writes, “Science knows only of *when*’s, and if the term *why* makes any appearance whatsoever among the causal connexions investigated by science it is actually the term *when* itself wearing a disguise. Of *why* used in the sense of *motive* or *reason*, scientific investigation reveals not a trace” (34).

Marsden continues her critical reading of Newtonian physics in a later piece titled “Two Rival Formulas,” published in the April 1918 issue of the *Egoist*. Therein, she betrays an awareness of Einstein’s theories—perhaps the first in England to appear in popular print—and the upheaval they will cause to science: “These very conceptions of time and space upon which Newton founded modern physics find themselves called in question, and in spite of the discounting by those qualified to judge of the effects which such a condition of affairs must have

upon the scientific outlook, it is certain that these effects must be too great to be at present even conceivable” (51). As Marsden proceeds, she perceives that while the effects of the new physics on science will be great, their significance for philosophy will be greater still: “The entire question of knowledge, truth, and reality must come up for reassessment. Obviously, therefore, a new opportunity has been born for philosophy” (51). The creation of a new philosophy seems to be Marsden’s goal throughout *Lingual Psychology* and *The Science of Signs*, though the work unfortunately becomes bogged down in its own complexity and experimentation as it unfolds.

In another section of *The Science of Signs* titled “Our Philosophy of the ‘Real’” published in the August 1918 issue of the *Egoist*, Marsden further reveals an advanced knowledge of revolutionary developments in physics prior to their popularization, grappling still with what they could mean for her philosophy. With a reference to physics and “that mass of evidence recently forthcoming relative to the disintegration and constitution of the atom” (91), Marsden demonstrates a remarkable understanding of the nature of quantum physics and its engagement with that which is beyond the human capacity to know. She writes, “All the physical facts of our existence are being explained to us in terms of forces which we cannot see, scent, or hear, but which the skilled adept *can measure*” (91). For Marsden, science is about the numerical measure of things, and, in the case of atoms and fields (like electromagnetism), humans can only have knowledge of such properties rather than knowledge of the things themselves. She thus hits upon a key aspect of quantum mechanics that would not be developed until the next decade, namely, that on the quantum level, objects—if they can even be called objects—are beyond the realm of human knowledge and can only be studied via the measurements of their forces and energies. As Arkady Plotnitsky explains, “quantum mechanics relates to the observable effects of the interactions between unobservable entities and measuring instruments upon those instruments,

and only to those effects, without saying anything, and indeed disallowing one to say anything, about quantum objects themselves, assuming that such terms as ‘quantum’ or ‘objects’ still apply” (21). Marsden’s recognition that the “facts of our existence” can only be explained in terms of what physicists “can measure” therefore openly throws into question the foundations of knowledge for all the *Egoist*’s audience to process. Perhaps attempting to provide solace for what post-Newtonian physics will eventually imply, she states,

Hence it is that the common run of men must now needs live by faith: faith in sensory evidence simplified to its first elements to such a degree that the initiated possessing the necessary instruments are able to press it to unlimited lengths. Knowledge, in the sense in which the mechanician would have us understand knowledge, consists therefore solely of measure facts fully dressed in their individual numbers. (91)

Marsden’s comments provide a strong point of connection with Pound’s theories of the “firm novel” and the “serious artist,” both of which I explore in more detail later. Significantly for modernism, the three issues of the *Egoist* cited throughout this discussion of Marsden’s understanding of science all contain advertisements for Eliot’s *Prufrock* (1915), James Joyce’s *A Portrait of the Artist as a Young Man* (1916), and Wyndham Lewis’s *Tarr* (1918), an editorial decision that encouraged readers to make connections between shifting scientific discourse and early modernist aesthetics.

While Pound and Eliot would remain public figures after leaving the *Egoist*, helping usher in a new stage of the modernist movement, Marsden isolated herself and continued her philosophical investigations, eventually having them published by The Egoist Press in two volumes, *The Definition of the Godhead* (1928) and *Mysteries of Christianity* (1930). Even



among her former colleagues, the works were either criticized or generally ignored. The negative responses she received contributed to a deep depression, and Marsden spent the remainder of her life hospitalized in the psychiatric ward of the Crichton Royal Hospital in Scotland. Although she would not partake in the later stages of modernism, she exerted a definitive influence on its formative years through her work at the *Freewoman*, the *New Freewoman*, and the *Egoist*, cultivating the movement's philosophical foundation in relation to science while enabling and promoting the aesthetic talents of many of its revolutionary figures.<sup>21</sup> As Bruce Clarke describes, Marsden “gave significant sustenance to Rebecca West, Harriet Shaw Weaver, H. D., Amy Lowell, and May Sinclair,” while also acting as “a fugitive midwife to the miraculous birth of a literary tradition out of the ‘individual talents’ of Pound, Joyce, Eliot, Lawrence, and Williams” (11).

### 3.3 Ezra Pound the Cultural Authority of Science

While Marsden would continue the philosophical endeavor she began in the *Freewoman* throughout her subsequent periodicals, her initial expositions of vitalistic egoism laid the theoretical foundation for the early modernist movement. After Pound arrived in London from the United States in 1908, he was exposed to her ideas and went about formulating the anti-traditional school of Imagist poetry shortly after the expiration of the *Freewoman*.<sup>22</sup> In contrast to Marsden's use of science as a form of epistemological support for her philosophy, Pound would primarily look to science as a source of cultural authority to advance modernism as a serious, respectable enterprise in search of precision and truth. As Francesca Cadel notes,

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<sup>21</sup> For more on Marsden's life, see Garner.

<sup>22</sup> For a biographical overview of Pound's early life, see Wilson 1-76. For a study focusing exclusively on Pound's contributions to modernism, see Pratt.

“Pound from his earliest years was fond of using the antisentimentalist rhetoric of science in his critical writings as a metaphor for accurate observation—and occasionally as a sign of occult truth” (264).<sup>23</sup> Upon Pound’s arrival in London, the mainstream scientific discourse was still a mixture of scientific vitalism and the more dominant vocabulary of thermodynamic energies. Although quantum theory was inaugurated by Max Planck’s discovery of his blackbody radiation law in 1900, it had yet to be popularized, in contrast with electromagnetism, classical atomism, and thermodynamics, which were well in the popular domain by then. Einstein’s work was also still largely unknown and would not feature prominently in England until after his theories began to be popularized in 1919. Working amidst this environment, Pound strove to use his early periodical writings to draw a strong analogy between science and art. In doing so, he hoped to appropriate the cultural prestige enjoyed by science to establish his theories of poetry and the novel as serious creations that should not be answerable to the demands of censors and the opinions of mass society.

Even though Pound would not work with Marsden until several years after moving to England, his early theoretical expositions indicate that he was thinking along the same scientific and philosophical lines as his feminist predecessor. Pound’s first main incursion into literary criticism relies only nominally on the authority of science. Similar to what Marsden was doing with her philosophy, Pound attempts to translate the prominent scientific discourse of vitalism into poetic terms to both conceptualize a new form of poetry and lend it the social respectability of science. In 1912, Pound contacted Harriet Monroe as she was busy launching the American magazine *Poetry: A Magazine of Verse* about publicizing his new school of *Imagisme*. Monroe hired Pound as the foreign correspondent for *Poetry*, thereby establishing a transatlantic

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<sup>23</sup> Bell’s *Critic as Scientist* provides the most thorough analysis of Pound’s relationship to science, though it generally avoids the role of print culture and the ways it helped popularize science.

partnership foundational for the modernist movement, and he quickly used his position to promote Imagism while also publishing and defending its adherents, which included, among others, W. B. Yeats, Aldington, and Hilda Doolittle (whom Pound gave the penname H. D., which she chose to adopt).

The March 1913 issue of *Poetry* contained the first strict formulation of Imagism along with some guidelines for prospective poets who aimed to distance themselves from the vague impressionism of the Symbolist school of poetry that was prominent throughout Europe in the late nineteenth century. In “Imagisme,” F. S. Flint lays out three rules for *imagistes*: “Direct treatment of the ‘thing,’ whether subjective or objective”; “To use absolutely no word that did not contribute to the presentation”; and, “As regarding rhythm: to compose in sequence of the musical phrase, not in sequence of a metronome” (199). Pound then takes over in a short piece titled “A Few Don’ts by an Imagiste,” which describes imagist poetry as a unique, individualist event erupting in a specific space at a specific time only to transcend them both. Like Marsden’s ego, Pound’s “Image” is “that which presents an intellectual and emotional complex in an instant of time” (200). The Imagist’s psychological complex “gives that sense of sudden liberation; that sense of freedom from time limits and space limits; that sense of sudden growth” (200-01). Pound’s understanding of independent poetic expression via the directness of the image here evokes the same transcendental liberation that Marsden argues may be found in her egoist philosophy.

As Pound proceeds in “A Few Don’ts,” he identifies a parallel between the scientific act of discovery and the ways that the image may reveal a hitherto unknown facet of human experience. Such an event, Pound argues, lays the foundation for authority and prestige: “The scientist does not expect to be acclaimed as a great scientist until he has *discovered* something.

He begins by learning what has been discovered already. He goes from that point onward” (204). Pound’s comment about scientists—and by analogy poets—building on the work of their predecessors anticipates Eliot’s later explication of this idea in “Tradition and Individual Talent” (1919), a piece of criticism that helped the transition from early to high modernism. For Pound in 1913, however, an awareness of the past should not disrupt or even influence the future trajectory of the individual poet. As Marsden’s ego must be defined as a unique, autonomous entity, so also must Pound’s Imagist: “Don’t mess up the perception of one sense by trying to define it in terms of another. This is usually only the result of being too lazy to find the exact word” (206). According to Marsden and Pound, still working independently at this time, originality requires effort so that the “thing”—whether ego or image—emerges from the noise around it as a distinct and remarkable entity.

Shortly after the publication of Pound’s “A Few Don’ts” in *Poetry*, Marsden launched the *New Freewoman*, which, as discussed above, marked a transition in her work from a form of feminism derived from scientific vitalism to her theories of the vitalistic androgynous ego. As Marsden’s attention shifted, a space opened for early modernism to emerge in British periodical culture. In *1913: The Cradle of Modernism*, Jean-Michel Rabaté explains that West served the crucial link between Marsden’s new periodical and the nascent modernist movement, noting that she “had chosen the camp of modernism and did all she could to promote Pound and his friends” (67). Indeed, West successfully petitioned Marsden to start including a literary section in the *New Freewoman*, which West quickly used to advertise Pound’s Imagist movement in the August 15, 1913 issue with a short piece simply titled “Imagisme.” The next several pages of this issue were populated with Pound’s poetry to provide the magazine’s readers with examples from this new school. Due largely to West’s friendship with Marsden, Pound was hired to the *New*

*Freewoman* as a contributing editor and literary correspondent, a position he used to publish poems from a variety of poets who viewed themselves as imagists, including Hueffer, H. D., Aldington, Amy Lowell, Flint, and William Carlos Williams. With his influence steadily growing at the *New Freewoman*, especially after West resigned as literary editor and was replaced by Aldington, Pound pounced on this periodical as a platform for modernism, hoping that the similarities between his views of poetry and Marsden's views of the ego would provide a strong enough connection for the relationship to thrive. As Rabaté describes, "In August 1913, Pound presented *The New Freewoman* to [Harriet] Monroe as 'our left wing,' and explained that he had taken charge of the literature department. Left-wing it was, with a specific emphasis on anarchism and feminism—and yet, the esthetic program of Pound and that of the editor, Dora Marsden, were almost identical" (65). Indeed, as their periodical partnership unfolded over the following years, Pound's theories of the modern artist would take their cue from Marsden's philosophical egoism as they both continued to fuse their respective ideas to the growing authority and popularity of science.

Despite the similarities between their projects, Marsden interrogated Pound in the summer of 1913 about his view of individualism and overall philosophical doctrine. Somewhat defensively, Pound responded in a letter, "The seven minutes at my instant disposal is hardly enough to define my philosophical credentials adequately. I suppose I'm individualist, I suppose I believe in the arts as the most effective propaganda for a sort of individual liberty that can be developed without public inconvenience" (qtd. in Clarke 107). According to Ian F. A. Bell's *Critic as Scientist: The Modernist Poetics of Ezra Pound*, Pound's challenge at this point in his career was formulating a new vocabulary that could appropriate ideas like those found in Marsden's philosophy for the advancement of modernist aesthetics. For Pound, scientific

rhetoric seemed to provide the proper conduit through which to translate his theories of poetry and prose. Bell explains that “his efforts to create a poetics informed by the discipline of science were the characteristic gestures of his modernity. It was a science-based terminology that gave Pound’s literary criticism its characteristic tone” (1). Fortunately for him, Pound had a public platform in the *New Freewoman* that he could use to pursue this fusion of science and literary criticism, which he set about doing in his famous 1913 essay “The Serious Artist.”

Published in three installments, “The Serious Artist” represents a landmark in the development of Pound’s literary criticism and early modernism’s relationship to science. Relying heavily on scientific rhetoric and terminology, Pound argues that the creation of art aligns with the practice of science insofar as they are both moral endeavors searching for truth about reality and human experience. Therefore, the serious artist, like the serious scientist, should be respected as a cultural authority on these issues. In the first portion of “The Serious Artist” that headlined the October 15 issue of the *New Freewoman*, Pound immediately adopts a defensive tone and alludes to his recent clash with Marsden over his philosophical beliefs, noting that he has “been questioned earnestly and by a person certainly of good will” (161). Shortly thereafter, Pound wastes no time stating his claim: “The arts, literature, poesy, are a science, just as chemistry is a science. Their subject is man, mankind and the individual. The subject of chemistry is matter considered as to its composition” (161). According to him, science is immeasurably valuable for providing knowledge, but its utility only extends to the limits of materiality, at which point the arts become the tool of choice for epistemological pursuits. Pound writes, “The arts give us a great percentage of the lasting and unassailable data regarding the nature of man, of immaterial man, of man considered as a thinking and sentient creature. They begin where the science of medicine leaves off or rather they overlap that science. The borders of the two arts overcross”

(161). Pound's invocation of the science of medicine refers to the development of medicine of the mind, which was initiated in nineteenth-century Vienna and would help give rise to psychoanalysis. For him, the arts are a science, but science itself should also be considered an art. While Pound mentions medicine in this passage, he proceeds to use examples from chemistry, biology, anthropology, and physics to support his argument.

Confident that he has established the parallels between the arts and sciences in the opening of "The Serious Artist," Pound turns to arguing the moral validity of art. He explains, "Bad art is inaccurate art. It is the art of false reports. If a scientist falsifies a report either deliberately or through negligence we consider him as either a criminal or a bad scientist according to the enormity of his offence, and he is punished or despised accordingly" (162). If the concern of serious artists is the immaterial dimension of human experience, then they have a moral responsibility to be truthful and accurate in the ways that they represent their epistemological domain. Pound also calls on his audience—not just anyone, however, as he clarifies later—to hold artists and authors accountable for the authenticity of their work. In a typical rhetorical move for Pound, he argues that the moral value of art lies in its accuracy and precision, which uncoincidentally are the founding tenets of his school of Imagism. He writes, "Purely and simply that good art can NOT be immoral. By good art I mean art that bears true witness, I mean art that is most precise. You can be wholly precise in representing a vagueness. You can be wholly a liar in pretending that the particular vagueness was precise in its outline" (162). Pound continues with his analogy of art and science, describing that the "arts give us our best data for determining what sort of creature man is" (162). Although he earlier alluded to the idea that the serious artist should be held accountable, Pound clarifies that those qualified to do so are not the common public: "The serious artist is usually, or is often as far from the ægrum

vulgar as is the serious artist” (163). His suggestion here is that the work of serious artists can only be judged by other serious artists, thereby reserving this authority for himself and his colleagues. In Section III of “The Serious Artist,” Pound reveals the general scientific milieu of the early twentieth century before the popularization of Einstein’s relativity when he attempts to explain scientifically what exactly matters in art. Echoing Marsden’s appropriation of scientific vitalism, he describes, “We might come to believe that the thing that matters in art is a sort of energy, something more or less like electricity or radio-activity, a force transfusing, welding, and unifying” (194). In Pound’s early criticism, this artistic energy is embodied in the Imagist object of poetic representation, which the serious artist unveils in the manner of a scientific discovery about the immaterial dimension of humankind.

Once the *New Freewoman* evolved into the *Egoist*, it quickly became the preeminent periodical for the development of early modernist aesthetics as they continued to mature alongside scientific discourse. Lewis’s *Blast*, which was founded with Pound’s assistance, was likewise important to this stage of modernism through its contribution of Vorticism, open condemnation of rival movements, and further publicity for modernist authors.<sup>24</sup> However, *Blast* lasted for only two issues, shutting down in 1915, and Lewis’s modernist novel *Tarr* would have to be serialized later in the *Egoist* from 1916-17.

In *James Joyce, Science, and Modernist Print Culture*, Jeffrey S. Drouin addresses the ways in which the *Egoist* expressed a budding theory of modernist literature that relied heavily on scientific discourse for its authenticity and moral authority. Drouin observes that the *Egoist*’s contributors shared the belief that “science and literature are part of the same endeavor to expose truth, and that they share a moral urgency to eliminate the deceptive veneer of mass culture”

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<sup>24</sup> For more on Pound’s work with Vorticism and its relationship to science, see Bell’s “Ezra Pound and the Materiality of the Fourth Dimension” and Albright 111-217.



(10). Indeed, the *Egoist* surfaced amidst the early-century flood of sensationalist journalism, new technologies, and wartime propaganda, all of which sought to present their own versions of truth and morality. Drouin explains that in an increasingly polyphonic environment, “the novel, with its size and completeness, came to emblemize the world as it fell apart physically, morally, and intellectually. Pound’s evolving theory of the novel therefore serves as a marker for the radical changes in aesthetics and ethics that occurred during the period” (16). Since science was generally deemed to be above the cacophony of mass culture, it provided a useful and accessible means of legitimizing modernist literature. As Drouin explains, “Science does not impose a preconceived structure upon the world, and for that reason was considered to be one mode of thought that could attune readers to what was real in the face of illusions propagated by mass media” (26). Throughout the *Egoist*’s five-year run from 1914 to 1919, many of the primary contributors, including Pound, Marsden, and Eliot (who joined as an assistant editor in 1917), would make steady appeals to the authority of science to express changing views of literature, knowledge, and the nature of truth. Physics especially would play a large role in the pages of the *Egoist* as news of Einstein’s theories of relativity—still not fully popularized until around the *Egoist*’s closure—and their epistemological implications crept their way into British society.

The focus of Pound’s attention and energy while working at the *Egoist* was developing a theory of the “firm” novel—a rendering of his precise, direct poetic image into novel form—using his influence and connections to get examples into print. In many ways, his work at the *Egoist* was a continuation of the earlier project he began in “The Serious Artist.” As scholarly literature has thoroughly explored, Pound’s main problem was overcoming the difficulties of censorship to publish Joyce’s *Portrait* (serialized 1914-15 and published in book form by The *Egoist* Press in 1917) and Lewis’s *Tarr* (serialized 1916-17 and published in book form by The

Egoist Press 1918).<sup>25</sup> Both novels were crucial to the development of modernist literary criticism and form because they provided Pound with the texts he needed to develop and publicize his theories of the novel. Furthermore, they each depicted a protagonist who embodied and expressed Marsden's vitalistic egoism—thus exemplifying the titular message of *The Egoist*—while doing so in a manner that likewise broke away from the traditional confines of material realism. Pound's success in overcoming literary censorship—due also in large part to Weaver's efforts overseas—to publish *Portrait* and *Tarr* is indebted to his appeals to the role of science in society, which wedded foundational theories of the modernist novel to scientific discourse.

An exemplary piece by Pound that demonstrates his use of science in simultaneously theorizing the firm novel and making his arguments for publishing “obscene” literature may be found in his short “Meditatio,” which appeared in the March 1, 1916 issue of the *Egoist*. After opening with a lament about his difficulty getting “the two most remarkable novels, written in English by our generation” published, Pound announces the need for a more stable form of literature that can resist the superficiality and fluctuations of mass culture: “Yet it is more desirable that a nation should have a firm literature than that paste-board nonentities should pour forth rehashed Victoriana on Sundays. Waste! Waste, and again, multiplicity, waste!” (37). Further expanding his argument in “The Serious Artist,” Pound proceeds to invoke Edmond de Goncourt, who wrote, “now that the novel has imposed upon itself the studies and duties of science, one may again make a stand for its liberties and privileges” (37). Indeed, Pound sets the authority of science against the historical authority of the Church, alluding to “Galileo's quondam heresy” (38). As Galileo was condemned by the Church yet later found to speak the truth, so also is Pound's firm literature being censored and kept out of print despite perceiving

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<sup>25</sup> For a few sources that discuss modernism and censorship, both in relation to Pound and other authors and editors, see Parkes, Marshik, Bradshaw, and Potter.

the actual nature of reality. Pound concludes “Meditatio” by asking, “if one can’t, *parfois*, write ‘as a physician, as a savant, as a historian,’ if we can’t write plays, novels, poems or any conceivable form of literature with the scientist’s freedom and privilege, with at least the chance of at least the scientist’s verity, then where in the world have we got to, and what is the use of saying anything, *anything?*” (38). As if to demonstrate his desire for the artist to speak freely, Pound’s “Meditatio” was printed alongside poems and short fiction by H. D., Lowell, Aldington, and Lewis, a juxtaposition that prompted the *Egoist*’s readers to see the overlap between his polemic and modernist literature.

### 3.4 T. S. Eliot, Anti-Individualism, and the Arrival of High Modernism

While Marsden’s and Pound’s thought was heavily influenced by the scientific climate of the early twentieth century, a time when discourses of energy, vitalism, and force reigned supreme, Eliot’s was modified according to the epistemological shifts engendered by Einstein’s theories of relativity. Eliot met Pound in 1914, and the elder poet immediately recognized a remarkable talent and potential exemplar for his literary theories. When he arrived at the *Egoist* in 1917, Eliot helped reorient the periodical’s focus toward a more anti-individualist aesthetic that would shift the modernist movement into its later stage. This evolution of modernism occurred as science was transitioning to a post-Newtonian age and Einstein and his theories were achieving remarkable popularity and merging with mass culture. Building on Marsden’s use of science to support her philosophical egoism and Pound’s appropriation of scientific rhetoric and methodology to lend modernism a measure of cultural authority, Eliot forged a relationship with science through which he presented modernism as a cultural equal that had undergone a similar developmental history yet maintained its independence from mainstream trends.

While at the *Egoist*, Eliot published mainly criticism and reviews, sometimes under the pseudonym “Apteryx,” though his collection of poems *Prufrock and Other Observations* (1917) was heavily advertised. What set Eliot apart from the other modernists at the *Egoist* and made him a catalyst for change was his early exposure to elements of relativity and quantum theory. According to Michael H. Whitworth, Eliot first encountered Einstein’s ideas in a graduate seminar at Harvard University in 1913-14. There, he was introduced to the theory of special relativity (the theory of general relativity was not published until 1916) by physicist Leonard Troland. Whitworth also points out that Troland lectured on the work of Planck, who was responsible for the advent of quantum theory (“Natural Science” 338-39). Eliot’s exposure to these ideas led him to hint at the impending paradigm shift to the *Egoist*’s audience. In the May 1918 issue, writing as T.S. Apteryx, Eliot professes in his “Observations,” “What we want is to disturb and alarm the public: to upset its reliance upon Shakespeare, Nelson, Wellington, and Sir Isaac Newton; to point out that at any moment the relation of a modern Englishman to Shakespeare may be discovered to be that of a modern Greek to Æschylus” (69). As Eliot moved toward the publication of his famous “Tradition and Individual Talent,” which would appear in the final two issues of the *Egoist*, he was also formulating an approach to aesthetic criticism that would disrupt the individualist emphasis that Pound and Marsden had forged throughout the periodical’s earlier issues.

In Whitworth’s essay, “*Pièces d’identité*: T. S. Eliot, J. W. N. Sullivan and Poetic Impersonality,” he makes significant connections between Eliot’s early criticism and J. W. N. Sullivan, a scientific journalist and deputy editor of *The Athenaeum*. Drawing heavily on primary sources, Whitworth argues that “Eliot’s identity as a critic . . . was sustained and confirmed by his contemporaries through a sequence of borrowings and coterie allusions” (149). Whitworth

points out that Eliot's well-known theory of poetic impersonality expressed in his lecture "Modern Tendencies in Poetry" (delivered October 28, 1919) and "Tradition" was likely indebted to Sullivan's musings on the aesthetics of science and scientific persona after Arthur Eddington found his famous evidence for Einstein's theory of general relativity during the solar eclipse on May 29, 1919 by measuring the bending of light rays around the Sun. (Some evidence for the theory was available earlier.) According to Whitworth, this event "unleashed a torrent of articles on the subject, both popular and technical" with "some expounding the theory in the simplest of terms, some debating particular aspects, others attempting to determine its significance in a wider context" (151). Mainly falling into the latter category, Sullivan "pioneered the exposition of relativity and the exploration of its implications" (152), contributing five articles to the *Athenaeum* in May and June of 1919. In fact, both Sullivan and Eliot were regular contributors to the *Athenaeum* as well as *The Times Literary Supplement*, thus sharing the same audience for a portion of their work and suggesting they likely read each other's. They also met on several occasions, Whitworth notes, and engaged with the same circles (152-53). Beyond Eliot, Sullivan was a prominent scientific authority among the modernists, engaging with both the Garsington and Bloomsbury groups. In a 1922 letter to John Quinn, Pound recalls meeting Sullivan and discussing relativity: "He gave me a lucid explanation of something he says is Einstein, which is more than anyone else had tried on me" (216). Lewis even recruited Sullivan to write an article for the first issue of *The Enemy* (f. 1927), and Joyce tried unsuccessfully to get him to introduce the fragmentary *Tales Told of Shem and Shaun* (Drouin 9).

The first part of Eliot's "Tradition," published in the September 1919 issue of the *Egoist*, begins by summarizing the vitalistic egoism that had hitherto undergirded the formulation of Marsden's philosophy and Pound's literary criticism as a point of contrast for his new form of

anti-individualist aesthetics. When pondering the history of criticism, Eliot writes, “One of the facts that might come to light in this process is our tendency to insist, when we praise a poet, upon those aspects of his work in which he least resembles anyone else. In these aspects or parts of his work we pretend to find what is individual, what is the peculiar essence of the man” (54-55). For readers of the *Egoist*, these words would resound with the familiar message they had encountered in various forms throughout the periodical’s five-year run. Eliot then juxtaposes his definitive concept of the “historical sense,” which “involves a perception, not only of the pastness of the past, but of its presence” (55). In contrast to Pound, Eliot argues that serious art does not behave as a monistic, isolated phenomenon; instead, the “existing monuments form an ideal order among themselves, which is modified by the introduction of the new (the really new) work of art among them” (55).

According to Whitworth, Eliot was likely influenced by an earlier popular science article by Sullivan published in the *Athenaeum* on May 2, 1919 dealing with the concept of historical consciousness in science. In a piece titled “The Justification of the Scientific Method,” Sullivan ruminates on the value of the scientific method in light of the overturning of Newtonian physics when the process so frequently leads to faulty deductions. He writes, “To judge from the history of science, the scientific method is excellent as a means of obtaining plausible conclusions which are always wrong, but hardly as a means of reaching the truth. The contradiction is only apparent, however, for it will be found that there is a part of every discarded hypothesis which is incorporated in the new theory” (274). As Whitworth points out, then, Sullivan’s understanding of scientific theory provides Eliot with a model for his conceptual aesthetic “monuments.” Rather than discarding aesthetic tradition under the aegis of individualist egoism, the artist should subsume the past into the present to create something new, just as Sullivan describes the

incorporation of old scientific hypotheses into new theories. This parallel, however, is only partial because great art cannot generally be disproven, while great science, such as Newtonian physics, can. Fittingly, both parts of Eliot's "Tradition" appeared in issues of the *Egoist* alongside episodes of Joyce's *Ulysses*, a text that Eliot would later laud for exemplifying the "mythic method" in his essay "*Ulysses*, Order, and Myth" (1923).

Later in "Tradition," Eliot continues analogizing his form of art with the new era of scientific discourse though his understanding of depersonalization in literary composition. Previously on July 18, 1919, an article by Sullivan titled "Science and Personality" appeared in the *Athenaeum*. Therein, he offers a typical contrast of art and science, explaining that science "rests on the obliteration of personality, whereas a cursory reading assures us that art is an emphasis and expression of individuality" (624). While proper scientific practice had traditionally been viewed as a complete self-abnegation before the object of study, Sullivan believes that proper analysis "can discover the personal element in a great scientific work" (624). For him, "it is not altogether fanciful to speak of the individual quality of a mathematical essay in very much the same way as one speaks of this quality in a musical composition" (624). According to Whitworth's reading of these passages, they represent "concessions in an argument that championed the impersonality of science and suggested that the decadence of art was due to the excessive cultivation of personalities" ("Natural Science" 343). Indeed, Sullivan seems to be grappling with the seeming paradox of transforming personality into an impersonal individuality through the process of scientific work.

Similar to the ways that Pound sought to equate art with science through a comparison of their techniques and results, Eliot's "Tradition" seems to be a response to Sullivan's claims that science advocates the obliteration of personality while art glorifies it. According to Eliot, "The

progress of an artist is continual self-sacrifice, a continual extinction of personality” and it “is in this depersonalization that art may be said to approach the condition of science” (55). After these lines, Eliot introduces his famous analogy comparing the process of poetic composition to a chemical reaction. As if to perform the similarities and demonstrate the overlap of literary criticism and scientific experimentation, Eliot concludes the first portion of “Tradition” midway through this image, thereby leaving his readers to ponder the connections of how artistic and scientific ideas unfold over time. When he returns to the matter in December 1919, the final issue of the *Egoist*, he argues that the “poet’s mind is in fact a receptacle for seizing and storing up numberless feelings, phrases, images, which remain there until all the particles which can unite to form a new compound are present together” (72). Here, Eliot is presenting an aesthetic version of Sullivan’s “individual quality” that is a form of individual presence—the mind of Eliot’s poet is not erased, but rather a receptacle—distinct from a domineering personality. To clarify, Eliot continues, “for my meaning is, that the poet has, not a ‘personality’ to express, but a particular medium, which is only a medium and not a personality, in which impressions and experiences combine in peculiar and unexpected ways” (72). Since impressions and experiences are unique to each individual, the ways in which they combine within a poet will likewise be unique. Such a combination is not a “personality,” hence Eliot’s scare quotation marks, but rather an impersonal individuality that is a result of the poet’s mind as a “receptacle” or “medium.” While Pound’s serious artist and firm novel transcend their historical contexts, Eliot’s poet is a relative product of the environment in which she or he emerges. He concludes with emphasis, “And he is not likely to know what is to be done unless he lives in what is not merely the present, but the present moment of the past, unless he is conscious, not of what is dead, but what is already living” (73). For Eliot, of course, that which is dead lives on in the mind of the poet, who builds



upon the tradition so that others may do the same and leave behind not their personalities, but rather their impersonal individualities.

Published alongside a final segment of Marsden's *Science of Signs* and an additional episode of Joyce's *Ulysses*, among a few other items, Eliot's "Tradition" brought the *Egoist* to a close. While Eliot initially appreciated the *Egoist* as a serious review when he joined the staff, he had become increasingly frustrated with Marsden and her ongoing philosophical project, which seemed to weigh down the periodical with its confusing rhetoric. He wrote in a 1919 letter, "I have only met Miss Marsden once, and then (in strict confidence) frothed at the mouth with antipathy. The fact that the paper was primarily a means for getting her philosophical articles into print, and that its appearance was at irregular intervals owing to the length of time it took her to write them, I think militated against the success of the paper with many people who did not want to read them" (315). Indeed, in her final "Notice to Readers," Marsden attributes the *Egoist*'s closure to the difficulties of serially publishing works such as her *The Science of Signs* and *Ulysses*, along with the editorial staff's perennial confrontations with censors. As she puts it, "the *Science of Signs* series . . . requires considerable remodeling to fit it for permanent statement in book form, and the author considers that the work entailed will be too exacting to permit of her contributing at the same time the new series which was announced some months ago. Editorial contributions to the journal would accordingly have been held up for a considerable time" (70).

In addition to seeing the closing of the *Egoist* and the spark of a new anti-individualist stage of modernism, the year 1919 also ushered in the mass popularization of Einstein's relativity theory. His paper on the Special Theory of Relativity, "On the Electrodynamics of Moving Bodies," had been published in 1905, essentially claiming that 1) the laws of physics are

invariant in all inertial systems and 2) the speed of light in a vacuum is the same for all observers. The most critical implication of these discoveries is that the ideals of absolute rest and absolute motion, on which Newton's laws and Newtonian physics are built, were purely imaginary and could only be supposed for the purposes of daily life. Several years later in 1915, Einstein released his General Theory of Relativity, which caused an even greater upheaval to classical physics because it demonstrated that gravity affects both time and space, which together form an inseparable fabric of space-time. To oversimplify, this theory states that gravity bends space-time, and the matter producing the gravity moves according to this bending. A consequence of this relationship is that as the force of gravity strengthens, the passage of time within its sphere of influence slows and the curvature of space around the body of matter increases. Importantly, while relativity dispelled the notions of "absolutes" in physics, the theories themselves are still as deterministic as Newton's laws, but they are configured differently from one frame of reference to another. Despite their revolutionary nature, Einstein's theories were not widely circulated until 1919 because World War I impeded their further experimental validation. In May of that year, however, British physicist Arthur Eddington and his team successfully measured the curvature of starlight around the sun during the eclipse. This event was immensely significant for a continent reeling from the aftermath of a terrible conflict. As Françoise Balibar explains, "The fact that British astronomers had verified a German theory was immediately perceived and presented by a number of pacifist, internationally minded journalists as a symbol of peace regained. It was proof that science was capable of transcending nationalisms and could be a factor for peace making" (70-71).

The proof of Einstein's theories quickly generated an explosion of public interest and a flood of popular articles and books trying to explain both the science and cultural implications of

relativity. In Peter J. Bowler's *Science for All: The Popularization of Science in Early Twentieth-Century Britain*, he observes that summarizing relativity and the concept of space-time in everyday terms was immensely difficult, but "the fact that the theory was incomprehensible even to some well-known scientists only added to its fascination" (40). Over the next couple of years, the public was bombarded through practically every available print format with discussions about Einstein and his work. "By the end of 1922," Bowler explains, "the public had been regaled with a host of newspaper and magazine articles and books attempting (with varying degrees of success) to convey the gist of the new theory to the nonscientist who had no mathematics" (40). Bowler notes the appearance of articles on relativity during the early 1920s in periodicals such as the *London Times*, *Discovery*, *The Times Literary Supplement*, *Conquest*, *The Nation*, and the *Athenaeum* (41). These pieces were written by both well-known figures like Eddington, Oliver Lodge, Bertrand Russell, and Sullivan and more obscure names. Nevertheless, as Whitworth explains in "The Clothbound Universe," the utility of short articles only extended so far: "Eddington's announcement created headline news in *The Times*, and occasioned many expositions in the weekly, monthly and quarterly journals. There were many brave attempts to compress the theory into a single article, but few succeeded, and so the boom in popular-science books began" (53).

As opposed to articles, these popular science books could more thoroughly expound relativity and related concepts while also ruminating on their epistemological effects. Early book expositions include Eddington's *Space, Time and Gravitation* (1920), A. N. Whitehead's *Concept of Nature* (1920), and a translation of Einstein's *Relativity: The Special and General Theory* (1920). The mid-decade saw the publication of additional books that not only sought to explain the theories, but also position them within other contemporary philosophical and cultural

discourses. Titles such as E. A. Burt's *The Metaphysical Foundations of Modern Physical Science* (1925), Sullivan's *Aspects of Science* (1925), Russell's *The ABC of Relativity* (1925), and Whitehead's *Science and the Modern World* (1925) fit into this category. While the boom in popular science books would continue until the end of the decade and beyond, the advent of quantum mechanics in 1925 and its popularization thereafter would fundamentally alter their content toward the new, nonclassical theories.

Within only a few years of his theories' confirmation, Einstein had become a celebrity in England. Commenting sardonically on Einstein's quickly-acquired fame, Eliot wrote in a 1923 "London Letter" published in the American periodical *The Dial*,

Einstein the Great has visited England, and delivered lectures to uncomprehending audiences, and been photographed for the newspapers smiling at Lord Haldane. We wonder what that smile implies; but Einstein has not confided its meaning to the press. . . . Einstein has taken his place in the newspapers with the comet, the sun-spots, the poisonous jelly-fish and octopus at Margate, and other natural phenomena.

Perhaps unsurprisingly, the modernists, who were so eager to engage with Einstein's theories when they were occult knowledge unknown to the public, quickly expressed their distaste with what had now become just another part of the sensationalism of mass culture.<sup>26</sup> As Daniel Albright describes, "the revolt against Einstein came quickly, and soon Einstein was to become one of the great villains of literary modernism" (9). Albright observes that in addition to contributing to the popular aspect of culture that they despised most, the modernists rejected

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<sup>26</sup> The modernists were not alone when they considered that the excitement surrounding relativity might be temporary. When Einstein was awarded the Nobel Prize for Physics in 1922, it was for his work with the photoelectric effect rather than relativity.

Einstein for both professional and personal reasons. While some modernists like Pound and Lewis had worked to move aesthetics away from the vagueness of Symbolism and Impressionism (which Pound described as corpse-like [*Ezra Pound and the Visual Arts* 152]) toward a clearer, more direct expression of meaning in their theories of Imagism and Vorticism, relativity seemed to support the validity of their old enemies. Albright explains, “Insofar as his reality seemed to be demoted to a dreamlike and evacuated condition, Einstein was a kind of symbolist. Insofar as his reality seemed to be a nervous spasm of ever-changing relativistic data, Einstein was a kind of Impressionist or Post-Impressionist” (11). On a more personal level, Albright notes, some of the modernists likely revolted against Einstein because he was Jewish. As D. H. Lawrence, for example, wrote in 1922, “Mr. Einstein, we are glad to say, has pulled out the very axle pin [of the universe]. . . But the Jewish mind insidiously drives us to anarchical conclusions” (qtd. in Albright 10). While many modernists openly expressed their disdain for Einstein, relativity, and this new facet of mass culture, inwardly they could not deny the lasting cultural influence it would entail should the theories endure.

Amidst the popularization boom of Einstein’s theories, Eliot went about founding *The Criterion: A Quarterly Review*, which represents the next stage of evolution in the modernist periodical after the *Egoist*. Eliot took the lessons he had learned from his former position and transferred them to this new venue whose appearance in British society would signal the advent of high modernism. As Michael H. Levenson argues, “If we look for a mark of modernism’s coming of age, the founding of the *Criterion* in 1922 may prove a better instance than *The Waste Land*, better even than *Ulysses*, because it exemplifies the institutionalization of the movement, the accession to cultural legitimacy” (213). Jason Harding points out in “The Idea of a Literary Review” that the *Criterion*’s initial print run of six hundred copies indicated that Eliot was

targeting an audience who were “fit but few: an elite of writers, critics, and patrons of the arts—a choice readership who might advance Eliot’s social and literary career” (349). Eliot had high hopes that the *Criterion* would be more successful than Marsden’s trilogy of periodicals, reaching a much larger audience and enjoying a more prestigious position in England, similar to that of the other periodicals to which he contributed, like the *Times Literary Supplement*. His growing fame as both an author and a critic certainly helped. According to Harding, a more mainstream periodical emphasizing literature was exactly what the modernist movement needed to flourish: “*The Criterion* was an institution crucial to the dissemination and consolidation of modernist writing, seeking to lessen the isolation of avant-garde writers from a broader, educated reading public” (349). The *Criterion* no doubt included an impressive list of names and titles even before morphing into *The New Criterion* in 1926, including Eliot’s *The Waste Land*, sections of Pound’s *Cantos*, extracts from Lewis’s *The Apes of God*, an installment of Joyce’s *A Work in Progress*, and other works by Woolf, Yeats, Proust, Lawrence, and Aldington (351).

From the outset, the *Criterion* was actively engaged with science, especially Einstein’s post-Newtonian physics. While science was constantly referenced and used as a source of authority in the *Freewoman*, the *New Freewoman*, and the *Egoist*, Eliot envisioned that his new periodical would contain more explicitly scientific material written by scientists themselves. He wrote to Pound in 1922 while planning the *Criterion* and expressed a desire to make the review “as unliterary as possible” by soliciting contributions from figures like Eddington (593). In May of the following year, Eliot wrote to Eddington explaining that he would like “to extend the scope of the paper and include work not only by the most important men of letters, both English and foreign, but also by distinguished scholars and men of science” (159). Taking care not to alienate his non-technical readers, Eliot asks that any contribution from Eddington be

understandable to “educated and intelligent persons of only the ordinary mathematical training” (159). Despite Eliot’s efforts, Eddington did not write anything for the *Criterion*, and, in fact, few legitimate scientists would, leaving only a few scattered articles about science.

What did appear in the *Criterion*, however, were a plethora of reviews of popular science books that traced scientific developments, especially relativity and quantum mechanics, and their cultural implications. In Whitworth’s important study of science, modernism, and print, *Einstein’s Wake: Relativity, Metaphor, and Modernist Literature*, he lists reviews of the following books from the *Criterion* in his bibliography, all of which appeared in the late 1920s and 30s: Jeans’s *The Universe Around Us* (1929), *The Mysterious Universe* (1930), and *The Background of Physical Science* (1934), Eddington’s *The Nature of the Physical World* (1928) and *New Pathways in Science* (1935), Burt’s *The Metaphysical Foundations of Modern Physical Science* (1925), Russell’s *The Analysis of Matter* (1927), Whitehead’s *Science and the Modern World* (1925), and L. S. Stebbing’s *Philosophy and the Physicists* (1937). This nearly comprehensive list gives an idea of how scientific material appeared in the *Criterion* primarily through the medium of non-scientific reviewers. More importantly, it shows that while the *Criterion*’s audience was exposed to science, it was most frequently done on Eliot’s own terms as an editor as he oversaw the authorship and content of these popular science books reviews.

Although Eliot may have embraced some aspects of relativity prior to their popularization and during the *Criterion*’s infancy, several scholars have noted that his relationship with science soured as time passed and his Christian faith grew. Katherine Ebury, for instance, explains that Eliot’s definitive poem, published comparatively early in his career in 1922, seems to be indebted to the early popularization of Einstein’s theories: “the dense allusiveness of *The Waste Land*, where the words of poets from different centuries are mingled with Eliot’s own voice,

depicts a . . . lack of distinction between temporal moments; time in *The Waste Land*'s universe may indeed be a relativistic continuum, since Einstein's famous visit to England took place in 1921, when Eliot was still hard at work on the poem" (*Modernism and Cosmology* 20).

Nevertheless, Ebury also observes that the general disdain felt by modernists for the popularization of relativity may be detected throughout the *Criterion* as it developed during the 1920s. According to her, "by the middle of the decade we see [Eliot] turn against relativity, and especially against popular expositions of the theory, attempting to commission multiple negative reviews of the latest popular science for the periodical" (6). Indeed, Ebury points to a 1927 review of Eddington's *Stars and Atoms* (1927) authorized by Eliot that poignantly criticizes the author's style as inadequate for "the more fastidious mind" and "a slight but continual irritation" (qtd. in Ebury 6). Harding additionally emphasizes the negative presentation of popular science works, noting especially the 1930 publication of Eliot's translation of Charles Mauron's "On Reading Einstein," a piece that curtly dismissed mainstream discussions of relativity (*The Criterion* 172-73). Overall, Eliot's relationship with the new physics as expressed throughout the pages of the *Criterion* was a complicated mixture of criticism regarding its content, obligation due to its cultural importance, and even a bit of bitterness toward its popularity. While Eliot was certainly aware of the value of science and its appeal to his readers, hence the continuous reviews of popular science books, he refused to embrace fashionable presentations of relativity perhaps because, as Ebury argues, he felt they unjustly discounted metaphysics and might have a negative effect upon the Christian cosmology ("Eliot's Cosmology" 141).

Over the following years, the *Criterion* would change names multiple times to better accommodate the nuances of its content, becoming *The New Criterion: A Quarterly Review* (1926-27), *The Monthly Criterion: A Literary Review* (1927-28), and finally *The Criterion: A*



*Literary Review* (1928-39). Throughout its lifespan, the *Criterion* served as a crucial platform for the intersection of literature, art, philosophy, science, and politics, among other topics. As Harding explains, “The ‘matrix’ of modernism highlights only one strand of the heterogeneous periodical networks that came together in Eliot’s eclectic magazine. Plucking out the names of a few modernist writers gives only a partial picture of *The Criterion*’s range and influence” (“The Idea” 363). While the *Criterion* was undoubtedly the critical successor of Marsden’s periodicals, its contents expressed the vast diversity of opinions and viewpoints active within the modernist movement as it matured. Ever the voice of criticism, Pound offered these thoughts about Eliot’s magazine in “Small Magazines” (1930):

I cannot say that the ideas Mr. Eliot has selected to have discussed in his *Criterion* have been unfailingly lively. Many of them seem to me to be unworthy of any human attention whatsoever, and he persists in printing one or two scribblers who are beneath all possible biological contempt. Nevertheless, he has induced a care in the use of critical terms that was absent during the antecedent period of critical and reviewatorial slop. (698)

In relation to science generally and relativity specifically, the *Criterion* demonstrates that while modernism employed print platforms during the 1920s to engage with science, the movement was far from reliant on the popular discussions surrounding Einstein’s theories in developing its form of literary and aesthetic criticism. Instead, for the *Criterion*, science served as a useful sparring partner. It certainly could not be ignored no matter what Eliot felt personally, so he strove for a balance in the pages of *The Criterion*, actively promoting discussions about popular science books and their content without ever buying into the sensationalism of fashionable accounts of Einstein’s theories.

### 3.5 Conclusion

Like many periodicals of the era, the *Criterion* was forced to close at the outbreak of World War II. Yet, along with the *Freewoman*, the *New Freewoman*, and the *Egoist*, it served to enable the coming-of-age of modernism and provide the movement with an institutional basis that commanded respect from British society. Through these periodicals and the work of their editors and contributors, modernism forged a symbiotic relationship with science through which it could adopt and appropriate ideas, rhetorical strategies, terminology, and authority and yet maintain its cultural independence. At the outset of Pound's *ABC of Reading* (1934), a didactic text intended to summarize his view of literary criticism, he acknowledges, "We live in an age of science and abundance" before proceeding into his lessons on "the applicability of scientific method to literary criticism" (17; 18). Having helped see modernism to fruition, Pound recognizes the movement's interdisciplinarity: "Literature does not exist in a vacuum. Writers as such have a definite social function exactly proportioned to their ability AS WRITERS" (32). Saturated with the discourse and terminology of science, Pound's rhetoric throughout *ABC of Reading* is indicative of the engagement between literature and science that was established in the pages of the *Freewoman*, the *New Freewoman*, the *Egoist*, and the *Criterion*. Reflecting on the importance of these periodicals, Pound writes, "The work of writers who have emerged in or via such magazines outweighs in permanent value the work of the writers who have not emerged in this manner. The history of contemporary letters has, to a very manifest extent, been written in such magazines" ("Small Magazines" 702). The history of modernism, however, was not composed in periodicals isolated from the multifarious cultural voices surrounding them, but rather in ones that promoted an ongoing dialogue with science that shaped the movement's theoretical discourse and set modernist literature apart from previous styles and forms.

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## CHAPTER 4. JAMES JOYCE'S HAUNTOLOGY OF THE SUBJECT

### 4.1 Introduction

"Tell us a story, sir," Stephen Dedalus's students enjoin in the "Nestor" episode of *Ulysses* (1922). "O, do, sir. A ghoststory" (2.54-55). Although Stephen leaves this audience's wishes unfulfilled, Joyce provides a replacement ghost story for his readers through his depiction of Stephen's subjectivity in *A Portrait of the Artist as a Young Man* (1916) and *Ulysses*. Rejecting the traditional *Bildungsroman* blueprint in which the protagonist achieves a stable, certain identity via a linear trajectory of experience and self-cultivation, Joyce suggests through these novels an alternate form of subjectivity permeated with uncertainty that prevents any absolute sense of self from being reached. Scholars have long noted the prevalence and importance of uncertainty in Joyce's work, with Phillip F. Herring going so far as to define it in terms of a principle of uncertainty. According to him, Joyce's uncertainty principle "introduces a range of interpretive possibilities that usually deceive a reader into believing that he/she is engaged in discovering the 'true' meaning of a text" (xii). While the extreme intertextuality of Joyce's work tempts his readers to decode its hidden "truth," as he cheekily predicted,<sup>27</sup> Stephen similarly attempts to discover the "truth" of his artistic subjectivity in *Portrait* and *Ulysses*. For Joyce, however, these truths are not absolutes that can be revealed or accessed; instead, as I explore in this chapter, his version of truth is like a specter, neither fully present nor fully absent, that haunts his texts and the subjects depicted therein with alterity and difference.

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<sup>27</sup> Of *Ulysses*, Joyce claimed, "I've put in so many enigmas and puzzles that it will keep the professors busy for centuries arguing over what I meant, and that's the only way of insuring one's immortality" (qtd. in Ellmann *James Joyce* 521).



Modernist literature generally and Joyce's work specifically provide useful avenues through which to investigate the epistemological significance of ghosts and haunted subjectivities due to modernism's preoccupation with disrupting the traditionally stable concepts of space, time, and identity. As Helen Sword notes, modernism was "a period marked by a vexed fascination with ghosts and by a persistent foregrounding of the temporal instability that ghostliness calls into play" (181). Modernist authors found ghosts both vexing and fascinating precisely because ghosts seemed to express the paradox of presence and meaning that modernists perceived in modern life and experience. A ghostly subjectivity is a post-Cartesian subjectivity, as William D. Melaney observes, made possible after the cultural breach with the ontological certainty of the Enlightenment and its aftermath: "The movement away from the centrality of the subject in the discourse on art involves a break with aesthetic humanism that opens up a new context in which Modernism can be resituated" (5). This new context represents a liminal space in which the usual binaries structuring Western society—presence/absence, past/future, meaning/non-meaning, identity/difference, self/other—no longer apply, thus allowing modernism to experiment with specter-like forms of meaning that exist between them.

While scholars such as Luke Thurston and Luke Gibbons have examined the actual ghosts and examples of haunting in Joyce's work, which, to a certain extent, I do too, I am primarily interested in more abstract forms of ghostliness that challenge classical understandings of presence and being as absolutes in space and time. Jean-Michel Rabaté claims that Joyce is one of several authors who "serve to map . . . the dim contours of a haunted modernity revisited by 'spectrographic' analysis, a modernity that is by definition never contemporaneous with itself, since it constantly projects, anticipates, and returns to mythical origins, but that also teaches us more about the 'present,' which it historicizes" (*Ghosts* 3). To better understand this haunted

modernity in which time is out of joint, I place the concept of the specter in Joyce's work, specifically as it applies to Stephen's subjectivity and Joyce's understanding of truth, in dialogue with two other paradigms of thought that likewise address ghosts in relation to the production of meaning: Derridean deconstruction and quantum physics. These epistemologies are particularly useful tools for illuminating the ghostly nature of Stephen's subjectivity because they represent, along with Joyce's work, forms of knowledge concerned with what comes after the death of totalities. Modernist literature, deconstruction, and quantum physics provide different cultural perspectives of a nonclassical form of what might be called "posthumous knowledge"—a type of knowledge that can emerge only when absolutes have been dissolved—in which the unknowable permeates and influences what can be known, whether that knowledge be of the modernist subject, philosophical truth, or the physical world.

While Joyce targets the totalized subject of literature, Derrida aims to deconstruct the structuralist approach to language as a totalized system of meaning constructed through the sign, traditionally conceived as a signifier and a signified working together to indicate a certain referent. Derrida's thought is a response to the alleged preeminence of speech over writing, a position dating from Plato's *Phaedrus* onward arguing that speech expresses, or is at least in close proximity to, an original or absolute, self-present meaning that can never be properly translated into writing. For Derrida, all language is writing in the sense that language as writing cannot reproduce the meaning that speech supposedly expresses because that meaning does not exist, nor did it ever. According to him, writing symbolizes an "economy of death," referring to the death of both the subject of writing and the purportedly original meaning of that which is written: "All graphemes are of a testamentary essence. And the original absence of the subject of writing is also the absence of the [absolutely original] thing or the referent" (*Of Grammatology*

69). Derrida's critique of phonocentrism, which assumes that speech is a means of representing an original truth, may be productively analyzed alongside the epistemology of quantum physics. Developed around the same time that *Portrait* and *Ulysses* were written, quantum physics throws into question another form of absolute presence and totalized meaning, namely, an independent physical reality capable of being objectively known. As Danish physicist Niels Bohr explains, "the quantum postulate implies that any observation of atomic phenomena will involve an interaction with the agency of observation not to be neglected. Accordingly, an independent reality in the ordinary physical sense can neither be ascribed to the phenomena nor to the agencies of observation" (*PWNB* 1: 54).

The numerous deconstructive readings of Joyce's work have thoroughly explored the ways in which his short stories and novels, especially *Ulysses* and *Finnegans Wake* (1939), subvert a linear, deterministic model of meaning production and the capitalized Subject.<sup>28</sup> Summarizing this long history of criticism, Derek Attridge and Daniel Ferrer observe that the goal for approaching Joyce's fiction through the lens of deconstruction is

not to produce an indefinite accumulation of its meanings . . . but to look at the mechanism of its infinite productivity; not to explore the psychological depths of the author or characters, but to record the perpetual flight of the Subject and its ultimate disappearance; not to reconstruct the world presented by the text, but to follow up within it the strategies that attempt a deconstruction of representation.

(10)

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<sup>28</sup> Derrida's own writing about Joyce may be found in "Two Words for Joyce" and "*Ulysses* Gramophone: Hear Say Yes in Joyce." For other deconstructive readings besides those cited in this chapter, see Roughley, Dasenbrock, Mahon, and Mitchel and Slote (eds.).

While Attridge and Ferrer note the ultimate dissolution of static meaning and the subject of certainty, other key deconstructive readings of Joyce have gone further to formulate an alternative understanding of subjectivity, one that I will expand upon and nuance using the epistemologies of Derrida and quantum physics in this chapter. Hélène Cixous analysis, for instance, employs Freud's concept of the *unheimlich* to argue that the revelation of the other in Joyce's work threatens the self with lack and consequently produces a different form of subject. She explains that this other self "becomes the 'double,' a stranger to the self, or its indirect manifestations: doubling of the self, split self, and all those subversions of the subject" ("Joyce" 19). This subverted subject relates to "the inexhaustible play of codes" into which "there slips in, indecipherable and hallucinatory by definition, the delirious code, a lost code, a kind of reserve where untamed signifiers prowl, but without the space of that reserve being delimited" (19). Cixous's notion of the continuously changing subject that emerges due to the perpetual play and production of meaning bears similarities with Kristeva's idea of the "subject-in-process," which she uses to discuss Joyce's writing. For Kristeva, the subject must be able to support the signifying economy of the "undecidable character of any so-called natural language" (135). While "there would be a speaking *subject* since the signifying set exists . . . this subject, in order to tally with its heterogeneity, must be . . . a questionable *subject-in-process*" (135).

While Attridge and Ferrer point out the ultimate disappearance of the absolute subject of certainty, Cixous and Kristeva indicate through their respective concepts of the subject of codes and the subject-in-process that the traditional subject returns but in a drastically different form intermixed with uncertainty. Building on these notions, I aim to demonstrate that Joyce's work, Derridean deconstruction, and quantum physics are all concerned with death and the return of that which has died as a haunted concept whose meaning derives from the play of difference

intrinsic to its nature. In their own ways, Joyce, Derrida, and quantum physics rebuke ontologies based on the existence of absolute, independent truths that can be realized through human experience. Whether it be the artistic identity to which Stephen aspires, the original meaning of the sign, or an independent physical reality, they pursue the implications of the death of totalities and the subsequent process of producing meaning through something that is no longer present but also not completely absent. In doing so, Joyce, Derrida, and quantum physics open a new realm for conceptualizing being that is haunted by uncertainty. To explore this haunted space, I employ Derrida's concept of "hauntology," which he introduces in *Specters of Marx* (1994), to illuminate the ways in which Joycean subjectivity, the Derridean sign, and the scene of quantum experimentation behave as trace structures, poststructural modalities of being in which the normal rules of space and time do not apply. By investigating Joyce's presentation of subjectivity in *Portrait* and *Ulysses* as a hauntology, I argue that he demonstrates literature's ability to express a poststructuralist truth about being that acquires different modalities of expression in philosophy and science. He thus conceptualizes a scientifically-grounded form of modernist subjectivity that emerges from the play of the unknowable and provides subsequent writers with a model for imagining the non-origins of that which is neither wholly present nor wholly absent.

#### 4.2 Derrida's Hauntology and Deconstruction of the Sign

Derrida's concept of hauntology provides a deconstructive framework for understanding the nature of Joyce's modernist form of subjectivity and the epistemological challenges that the development of quantum physics raises. The word "hauntology" is, of course, a play on the word "ontology," the philosophy of being, which, for much of the history of Western civilization, was prioritized as the fundamental branch of philosophy. While they each held nuanced views of the

topic, philosophers such as Plato, Kant, Hegel, Husserl, and Heidegger embraced the eminence of ontology in their thought. This classical approach to philosophy perceived being as a noun, a thing, with an absolute presence that could be identified and located. These two characteristics—identity and location—allow being to be something that can be known with certainty. “[T]o know is to know *who* and *where*” (original emphasis; *Specters* 9), Derrida writes. Identity and location are also constitutive of being and knowledge of that being in the laws of classical physics, which dictate that possessing a complete description of a particle requires knowing its velocity (identity) and position (location). The concepts of identity and location in classical ontological discourses establish distinct oppositions and dualisms that Derrida deconstructs in his work. In terms of identity, something either *is* or *is not* something; it cannot both be it and not be it. In terms of location, something is either present or absent, not both. Such binaries allow an absolute history of the being under consideration, complete with an identifiable origin, to be determined. Consequently, the absolute meaning of that being can be known too.

Rejecting this classical ontology, Derrida suggests instead “hauntology” as more appropriate for his deconstructive project. In *Specters of Marx*, he explains, “this element itself is neither living nor dead, present nor absent: it spectralizes. It does not belong to ontology, to the discourse on the Being of beings, or to the essence of life or death. It requires, then, what we call . . . *hauntology*. We will take this category to be irreducible, and first of all to everything it makes possible: ontology, theology, positive or negative onto-theology” (63). To describe the nature of a hauntology, Derrida puts the classical concept of being “under erasure” (~~being~~), a performative phrase he uses to describe the act of crossing out a concept because it is inaccurate while maintaining it as legible to indicate its necessity. For him, “being” is inaccurate because a hauntology does not deal with the ontological form of being previously described, yet it remains

necessary as a means of conjuring something that is not being but also not *not* being, like a ghost that is neither living nor dead, neither in this realm nor another. According to Derrida, “To haunt does not mean to be present, and it is necessary to introduce haunting into the very construction of a concept. Of every concept, beginning with the concepts of being and time. That is what we would be calling here a hauntology. Ontology opposes it only in a movement of exorcism. Ontology is a conjuration” (202).

As a conjuration, ontology conjures not being but rather what Derrida calls the “specter” of being, thereby shifting the concept of ontology to its deconstructive hauntological form. For him, the conjured specter of being reveals the utter inadequacy of the oppositions and dualisms that arise from classical ontologies. Derrida describes that “the specter is a paradoxical incorporation, the becoming-body, a certain phenomenal and carnal form of the spirit. It becomes, rather, some ‘thing’ that remains difficult to name: neither soul nor body, and both one and the other” (*Specters* 5). Operative within and through a hauntology, but not reducible to it, the specter breaks down the binaries governing identity (self/other, meaning/non-meaning) and location (present/absent, past/future), simultaneously meeting the criteria for both terms and neither of them. According to Derrida, this form of being that has been put under erasure no longer belongs to the domain of knowledge: “One does not know: not out of ignorance, but because this non-object, this non-present present, this being-there of an absent or departed one no longer belongs to knowledge. At least no longer to that which one thinks one knows by the name of knowledge” (5). The specter is “an unnameable [*sic*] or almost unnameable [*sic*] thing: something, between something and someone, anyone or anything, some thing, ‘this thing,’ but this thing and not any other” (5). Hauntology thus deals with that which defies categorization in

the history of philosophy, demanding a reevaluation of the way the concept of being is conceived.

Before proceeding into the ways in which Derrida's concept of hauntology informs his deconstruction of the sign, which will serve as a model for understanding Joyce's deconstruction of the subject and quantum physics' deconstruction of an independent physical reality, I would like to briefly discuss the ethical implications of putting being under erasure. Derrida argues that the "logic of haunting would not be merely larger and more powerful than an ontology or a thinking of Being . . . It would harbor within itself, but like circumscribed places or particular effects, eschatology and teleology themselves. It would *comprehend* them, but incomprehensively" (original emphasis; *Specters* 10). Derrida's describes hauntology as "larger" than ontology because it moves beyond absolute presence to consider also that which is present through absence. Such a consideration enables hauntology to be a more just system of conceptualizing being because it accounts for an otherness otherwise neglected. Björn Thorsteinsson links this justice to Derrida's comment that hauntology is also "more powerful than an ontology": "hauntology would be *more powerful* than tradition inasmuch as it would—and this is of capital importance—be a more just depiction of reality, (properly) understood as the realm of *différance* and/or of writing, and thus it would serve justice and prove more able to combat the injustices brought upon us by intransigent and ill-conceived attempts at totalizing and excluding the arrival of the other in a general sense" (162-63). Rather than reducing the alterity of being to a static, noun-form of being, hauntology allows room for unmediated and unadulterated difference without forcing it into binaries and set epistemological categories.

Derrida's concept of hauntology, as I have described it, derives from his famous deconstruction of the sign in *Of Grammatology* (1967; trans. 1976). While I also examine



Joyce's fiction and quantum physics as examples of putting, respectively, the being of subjectivity and the being of an independent physical reality under erasure, Derrida's approach to the sign provides a starting point for understanding the ways in which different modalities of being in philosophy, science, and modernist literature function as hauntologies and undermine being as a stable, identifiable entity. Derrida's *Of Grammatology* responds to the traditional philosophical accusation first articulated in Plato's work that writing is inferior to speech because writing inadequately reproduces, or "translates," the original meaning of speech. This view was then elaborated in Saussure's structuralist approach to language as a sign structure. According to Saussure, language can express an original meaning like Plato's speech because it is composed of signs, each of which results from the association between a signifier and a signified. In this model, the meaning of a sign in speech or language is present in the sign itself as the signified, thus implying that the sign always contains an original meaning. Throughout his *oeuvre*, Derrida maintains that all language is fundamentally writing and represents an attempt to reproduce an originary meaning that he argues does not exist. For him, writing (and speech) is not the reproduction of a meaning that is absolutely present in an original form elsewhere; rather, it is the reproduction of a meaning that is always-already present *as an absence*. Meaning, of course, is still produced through writing, but this production occurs due to the play between presence and absence rather than the existence of a set presence alone. Derrida calls this "present-absence" the trace, and he maintains that the trace inhabits and defines writing as a structure. A classical structure of language built on the presuppositions of presence and original meaning (a presence structure) therefore cedes to a structure of language suffused with the trace that does not have an origin (a trace structure). Derrida explains, "The trace is not only the disappearance of origin—within the discourse that we sustain and according to the path that we

follow it means that the origin did not even disappear, that it was never constituted except reciprocally by a nonorigin, the trace, which thus becomes the origin of the origin” (61). As a structure of the trace, writing deals exclusively with the production of meaning in the future, a meaning that, like the specter of a hauntology, is always “coming back.” The original “past” meaning is exposed to be merely the presence of an absent origin that is always-already gone.

While Derrida’s concept of a hauntology is a (non)structure of being haunted by the specter, his concept of writing is a (non)structure of the sign haunted by the trace. For him, a hauntology represents the putting of being under erasure, and writing represents the putting of the sign under erasure. In Derrida’s discourse, a sign does not derive meaning from a unified relationship with its referent, as classical structuralism would have it; rather, a sign derives meaning through the perpetual play of differences between the two, the movement between what a sign *is* and what a sign *is not*. In her “Translator’s Preface,” Gayatri Chakravorty Spivak describes, “Word and thing or thought never in fact become one. We are reminded of, referred to, what the convention of words sets up as thing or thought, by a particular arrangement of words. The structure of reference works and can go on working not because of the identity between these two so-called component parts of the sign, but because of their relationship of difference” (xvi). Like the specter in a hauntology, the sign is paradoxical; it is an intermixing of presence and absence, identity and difference, and self and otherness. If a sign is a structure of difference, then the trace represents the radical alterity within the sign that gives rise to this difference. As Spivak explains, “Such is the strange ‘being’ of the sign: half of it always ‘not there’ and the other half always ‘not that.’ The structure of the sign is determined by the trace or track of that other which is forever absent. This other is of course never to be found in its full being” (xviii). The meaning of a sign, then, is not present in the sign itself, like an opposing side

of a coin which is how the signified relates the signifier in structuralism, but rather constituted through the traces of other signs that always reside elsewhere acting through, or “haunting,” the initial sign.

According to Derrida, the sign must be perceived as under erasure because its meaning is not a stable presence in the sign itself capable of being located and identified. Instead, what would be called the sign’s meaning (in the deconstructionist sense of the term) emerges from the movements of the trace throughout a network of other signs that are likewise haunted by the traces of other signs. Derrida uses his concept of *différance* to describe these movements. Of *différance*, he explains, “it indicates difference as distinction, inequality, or discernibility; on the other, it expresses the interposition of delay, the interval of a *spacing* and *temporalizing* that puts off until ‘later’ what is presently denied, the possible that is presently impossible” (original emphasis; “*Différance*” 129). The play of deferrals and delays that defines *différance* precludes a sign from acquiring a location and identity—that is, an absolute presence—within the network of language that would grant the sign a certain meaning. Nevertheless, writing—or any system of language, for that matter—is possible precisely because of the movements of *différance*. Derrida writes, “We will designate as *différance* the movement according to which language, or any code, any system of referral in general, is constituted ‘historically’ as a weave of differences. ‘Is constituted,’ ‘is produced,’ ‘is created,’ ‘movement,’ ‘historically,’ etc., necessarily being understood beyond the metaphysical language in which they are retained, along with their implications” (*Margins* 12-13). A sign’s meaning is thus the interaction of difference within the sign itself. This difference indicates the (non)presence of the traces of other signs within the given sign that exist within a network of signs, the relationship between any two of which is always defined by *différance*. As such, a sign cannot be strictly present in the classical,

ontological sense of the word, like being cannot be present in a hauntology; a sign is both everywhere and nowhere. According to Derrida,

The play of differences supposes, in effect, syntheses and referrals which forbid at any moment, or in any sense, that a simple element be *present* in and of itself, referring only to itself. Whether in the order of spoken or written discourse, no element can function as a sign without referring to another element which itself is not simply present. This interweaving results in each “element”—phoneme or grapheme—being constituted on the basis of the trace within it or the other elements of the chain or system. (*Positions* 26)

A sign is a textile, a text, an interweaving of difference, an interweaving of the traces of other signs that are themselves composed of the traces of still more signs. The meaning of a sign is neither present nor does it have an origin; instead, its meaning, while both possible and necessary, is perpetually delayed and differed because it is haunted by the traces of other signs that likewise lack presence and origin.

#### 4.3 Joyce’s Hauntology of the Subject, Part I

When Derrida’s *Of Grammatology* was first published in English, the image of the Egyptian god Thoth was chosen for the cover. In ancient Egypt, Thoth was the patron god of scribes, history, and the divine archives; he was also associated with magic, wisdom, and the just conveyance of the dead in the afterlife. He therefore represents the posthumous transmission of meaning—meaning after the event of writing or death—that operates beyond human understanding. Derrida’s thought is associated with Thoth because deconstruction is a posthumous form of philosophy concerned with what comes after the death of totalities. Bridging Joyce’s modernist fiction with Derrida’s philosophy, Thoth is mentioned in the final section of *Portrait* when

Stephen pauses for a moment amidst his aesthetic musings to consider the limits of his confidence: “A sense of fear of the unknown moved in the heart of his weariness, a fear of symbols and portents, of the hawklike man whose name he bore soaring out of his captivity on osierwoven wings, of Thoth, the god of writers, writing with a reed upon a tablet and bearing on his narrow ibis head the cusped moon” (225). While Stephen is still thinking ontologically, the way his thoughts unfold and the possibility of meaning that emerges from their movements perform Derrida’s deconstruction of the sign while also providing a framework for my reading of his hauntological subjectivity. As Stephen ponders the threatening unknown, which stirs within his being, his mind freely wanders from ominous signs to Thoth and the act of writing. Rather than being a set presence in Stephen’s mind with an identity and location, however, the divinity’s name is conjured because it relates to something else that is likewise not fully present: “he would not have remembered the god’s name but that it was like an Irish oath” (225). The origin of Thoth as a sign and its meaning within the context of the complete thought is thus displaced to an Irish oath, namely *thauss ag Dhee* (meaning “God knows” and given here phonetically). Therefore, Thoth was not an absolute presence in Stephen’s mind, but rather the presence of an absence. The meaning of the thought itself is deferred and delayed as the sign points to another sign (the oath) that belongs to Irish cultural traditions that point to yet more signs. Like Derrida’s sign, Stephen thought is a trace structure, a hauntology in which alterity and difference haunt the supposed original.

My reading of Joyce’s hauntology of the subject as exemplified by Stephen throughout *Portrait* and *Ulysses* begins with what might be called the origin story of Stephen’s desire and the nonclassical ontological form of subjectivity it produces. According to Derrida’s deconstruction of the sign, which, again, provides a model for understanding Joyce’s

deconstruction of the subject, time has no bearing on the operations of the trace as it acts through the sign. He writes, “The concepts of *present*, *past*, and *future*, everything in the concepts of time and history which implies evidence of them—the metaphysical concept of time in general—cannot adequately describe the structure of the trace” (*Of Grammatology* 67). The meaning of the Derridean sign arises from the nonlinear, so, while it maintains a sense of historicity, this historicity does not legitimize the existence of an absolute origin. Like Stephen’s desire, the meaning of the sign does not mature or develop as time passes; instead, it is continually reconfigured due to the play of *différance* as the trace of meaning is displaced according to the deferrals and delays intrinsic to its nature. Derrida argues that the sign’s production of meaning via the movements of the trace is thus a passive process that precludes the sign from having a past that could stabilize its meaning in the present:

This passivity is also the relationship to a past, to an always-already-there that no reactivation of the origin could fully master and awaken to presence. This impossibility of reanimating absolutely the manifest evidence of an originary presence refers us therefore to an absolute past. That is what authorized us to call *trace* that which does not let itself be summed up in the simplicity of a present.  
(66)

Derrida refers to the “present-past” as a past that was at one time present, meaning that the present is always a sort of *telos* from a past moment. He explains that “if the trace refers to an absolute past, it is because it obliges us to think a past that can no longer be understood in the form of a modified presence, as a present-past. Since past has always signified present-past, the absolute past that is retained in the trace no longer rigorously merits the name ‘past’” (66). In nonclassical epistemologies like deconstruction, modernism (at least in the work of some figures,

such as Joyce), and quantum physics, adjectives such as “originary” and “past” used to describe the ontological concept of being are re-delimited and no longer apply in the traditional sense.

Joyce performs the deconstruction of the origins and pastness of Stephen’s subjectivity by displacing the beginning of his *Bildung* from *Portrait*’s fictional reality to a fairy tale.

The famous opening of *Portrait* reads, “Once upon a time and a very good time it was there was a moocow coming down along the road and this moocow that was coming down along the road met a nicens little boy named baby tuckoo. . . .” (7). The distance that Joyce achieves between Stephen’s origins—“*He* was baby tuckoo” (emphasis added; 7)—and the start of *Portrait* through his “once upon a time” calls to mind that which Fredrich Nietzsche opened when he began his “On Truth and Lie in the Extra-Moral Sense” (1873) with the line, “In some remote corner of the universe.” In this essay, which serves as a landmark for the development of Derrida’s thought, Nietzsche argues that the concept of truth emerges from the play of forces that have caused us to create “a mobile army of metaphors, metonyms, and anthropomorphism.” Language is thus figurative and fluid rather than literal and static, an idea that Nietzsche performs by beginning a philosophical essay that would supposedly have literal meaning with a figurative fairy tale. In Spivak’s preface to Derrida’s *Of Grammatology*, she emphasizes that Derrida intimately shared Nietzsche’s “suspicion of the value of truth . . . of meaning and of being” and of the “concept of . . . the primary signified” (xxii).<sup>29</sup> Whether approached as the truth, being, or primary signified of Stephen’s subjectivity, Joyce’s opening fairy tale in *Portrait* serves as a preface that enacts, as Nietzsche’s does too, what is already the case with the text it introduces. It removes Stephen’s subjectivity from a stable, linear version of time—a present-

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<sup>29</sup> See pp. xxi-xxxviii of Spivak’s Translator’s Preface for her discussion on Nietzsche and Derrida.

past—in which the terms “originary” and “past” still have meaning and situates the novel’s opening within the pre-existing deferrals and delays that makes absolute meaning impossible.

Joyce’s opening of *Portrait* introduces two other elements of classical ontology that he proceeds to undermine through his depiction of Stephen’s hauntological subjectivity: a seemingly attainable object of desire and an apparent trajectory by which it can be reached. Scholars have thoroughly explored the maternal dimensions of the “moo-cow” with its life-giving milk and symbolic status as church and country. As a reminder to his readers following Stephen’s life from *Portrait* to *Ulysses*, Joyce repeats the symbol of the sustaining woman in the “Telemachus” episode of the latter through the milkmaid who visits the Martello tower: “Old and secret she had entered from a morning world, maybe a messenger. She praised the goodness of the milk, pouring it out” (1.399-400). While Stephen is drawn to the milkmaid in *Ulysses* because she seems to possess a secret, to be some form of messenger, the infant Stephen in *Portrait* likewise establishes positive associations with his mother that indicate his desire is at work. In contrast to his father, who has a “hairy face” and “looked at him through a glass” (7), Stephen’s mother “has a nicer smell than his father” (7), and he loves to dance while she plays the piano. Among other scholars, Jean Kimball has exegeted the Oedipal dimensions of this scene and their overall significance in the novel. Observing that Joyce was familiar with several of Freud’s texts, Kimball explains that “Stephen’s memory . . . becomes colored with a repressed hostility and fear toward the father that is connected with excessive affection for the mother, the essential configuration of the Oedipus complex. And the mother appears in her proper person (assuming the cow to be a symbol for the boy’s earliest relationship with her) only after the father’s place in his babyhood has been acknowledged” (31). Stephen’s mother, however, is not the origin of his desire and labelling his relationship with her in strictly incestuous terms would



be reductive because her identity is already displaced from the character of May Dedalus to the moo-cow in the fairy tale. The moo-cow therefore represents the first modality of Stephen's desire that is already subject to the play of *différance* as he begins the act of being a subject, the act of becoming the sign.

An additional crucial element in *Portrait's* fairy-tale opening is the road on which the moo-cow travels, a road also laid out for baby tuckoo. Joyce's father, John Joyce, reveals in a letter that "the moo-cow . . . used to come down from the mountain and take little boys across" (*L III*: 212). In addition to setting up the apparent identification and location of the origins of Stephen's subjectivity, his status as the Derridean sign, Joyce provides the illusion of a path that will take baby tuckoo, Stephen's always-already displaced sign, to the *telos* of meaning waiting at the end of his *Bildung*. Spivak indeed notes that the French word Derrida uses for trace (*trace*) can be translated as "track," but doing so sacrifices the anterior presence of absence suggested by other possible translations like "footprint" and "imprint." In *Portrait*, Joyce uses the recurring symbol of a track or path to parody the subject's traditional journey toward social maturity and acceptance. Scholars as early as William York Tindall have observed the significance of the road, which "develops into the circular track round which Mike Flynn, the old trainer, makes Stephen run; into the track at Clongowes where Stephen, breaking his glasses, is almost blinded; into the dark road alongside which Davin meets his peasant woman; and, after many reappearances, all of which confirm and enlarge the initial idea and feeling of tradition, into its opposite, the road that promises freedom on the final page" (381). What readings such as Tindall's overlook is that Joyce's use of shifting versions of the road throughout *Portrait* draws attention to the superficiality of teleological subjectivity. While the traversing of one road may

seem to offer meaning, Stephen encounters another road shortly after that delays and defers the acquisition of the initial promise offered in the fairy tale of baby tuckoo.

Moving beyond the displaced origins of Stephen's subjectivity, I can now attend to the ways in which Stephen's hauntological desire denies him access to an ontological form of subjectivity that would possess an identity and location. Stephen undoubtedly has such a goal in mind even in the first section of *Portrait* when he pens a short list to locate his sign and contextualize it in relation to other signs that he hopes will allow him meaning: "Stephen Dedalus / Class of Elements / Clongowes Wood College / Sallins / Country Kildare / Ireland / Europe / The World / The Universe" (15). Joyce presents Stephen as a seemingly identifiable and locatable subject only to disrupt such absolute notions. While the Derridean sign is always-already haunted by the traces of other signs via the play of *différance*, Stephen as subject—the current form of "being" under analysis—is always-already haunted by a radical alterity that manifests itself as a desire whose fulfillment is subordinate to the same deconstructive dynamic of deferrals and delays.

Approaching the concept of desire in Joyce's work from various angles, scholars tend to reduce the deconstructive complexity of its operations to a critique of either the dialectic process or a psychoanalytic (Oedipal) paradigm. Gregory Castle, for instance, argues that *Portrait* "is perhaps the most compelling example of the way the modernist *Bildungsroman* manages to retain and even emulate the formal structures of a genre whose conceptual foundations and thematic concerns are at the same time subjected to critique and revision" (365). While Castle is correct to observe that *Portrait* reworks certain facets of the traditional *Bildungsroman*, I believe that Joyce's project is more radical than a simple critique and revision. Rather than depicting an alternative form of "being" as subjectivity, Joyce is completely dissolving the classical concept

of being itself, putting the subject, as Derrida would say, under erasure. Psychoanalytic readings of *Portrait*, even those that employ Lacan's theories of the signifier correctly, still situate Stephen within the confines of structuralism. Susan Stanford Friedman offers this summary of Lacanian approaches to the novel: "Within a Lacanian framework Stephen's *Bildung* follows the expected pattern of the son who has come to take up his position within the Symbolic Order according to the Law of the Father. The endless deferral of his desire—first for his mother, then for E.C.—is what allows him to occupy the position of the subject, the master of his signifier" (39). For Lacan, the subject's proper relationship with his or her desire equates with mastery of the subject's signifier. For Derrida, however, the sign cannot be mastered because the *différance* to which it is subject removes it beyond such totalities of meaning and their accompanying laws.

Joyce's subject as sign, as textile, as text, is composed through the interweaving of various forms of otherness, the traces of which act through Stephen as desire. Through *Portrait*'s five sections, Stephen's desire is continuously reconfigured in a manner that dissolves any illusions that he is progressing to the ultimate meaning of his artistic identity or, in Lacanian terms, mastery of his signifier. Unsurprisingly, the first configuration of Stephen's desire after the opening fairy tale that haunts his subjectivity is the desire of a biological other, his mother. During Stephen's first year at Clongowes, Wells, one of his fellow students, poses what will be the definitive question of Stephen's subjectivity in both *Portrait* and *Ulysses*: "Tell us, Dedalus, do you kiss your mother before you go to bed?" (14). Stephen responds in the affirmative to the apparently simple inquiry only to be mocked, which causes him to change his answer to the negative. He ponders, "What was the right answer to the question? He had given two and still Wells laughed" (14). In this scene, Stephen is forced to confront the nature of his desire and articulate his relationship to it in language even though desire itself exists beyond language. If

Stephen knew the answer to Wells's question, then he would not be following a poststructural trace of his desire, one that I am arguing indicates that his subjectivity is under erasure in *Portrait* and *Ulysses*, but rather an absolute teleological trajectory that would guide him with certainty to a stable ontological form of being. In *Ulysses*, when Stephen encounters his mother's ghost in the "Circe" episode, he demands that she provide the "word known to all men": "Tell me the word, mother, if you know now" (15.4192-93). For Stephen, however, the mystery of desire lies not just in love but more specifically in a mother's love and the love of a mother. He claims in "Scylla and Charybdis," "*Amor matris*, subjective and objective genitive, may be the only true thing in life" (9.832-33). The grammatical ambiguity intrinsic to the term *amor matris* is crucial because it signals that the play of *différance* is at work. Rather than love being the only true thing in life, the deferrals and delays operative within the concept of love as *amor matris* are the only true things in life. In his reading of Joyce, desire, and love, Jean-Michel Rabaté supports the notion that desire in Joyce's work maintains its influence on subjectivity through its undecidability. He argues, "Love, known to all 'men' is a secret which has to be disclosed again and again by 'women'—or mothers, perhaps—without further revelation of its magical power, or even its meaning" (Joyce xx). Indeed, even in the final section of *Portrait* when Stephen is at the height of his aesthetic arrogance, he still cannot articulate the magical power or meaning of the love of his mother. When Cranly asks him, "Do you love your mother?" Stephen is at a loss: "I don't even know what your words mean" (240).

The correlation between desire and the love of a mother revealed at the outset of Joyce's textual hauntology in *Portrait* extends beyond May Dedalus's role in Joyce's fiction. According to Suzette A. Henke, "For inspiration and indeed, for aesthetic grounding, [Joyce] must turn to woman as both virgin and mother, creator of life and symbolic emotional savior. The female

becomes in Joyce's writing a redemptive model of altruism and fertility, regenerative strength and a matriarchal power" (1). Such inspiration, whether conscious or unconscious, to express Stephen's subjectivity as a hauntology implicating his mother was cultivated in Joyce's own life. Richard Ellmann explains in his biography that Joyce's "childhood was dominated rhetorically by his father, but emotionally by his mother with her practicality, her unquenchable indulgence, her tenacity, even her inveterate pregnancy" (292). After Mary Joyce died in 1903, Joyce transferred his emotionally saturated relationship with her to Nora Barnacle. Ellmann notes of Joyce and Nora that Joyce "long[ed] to make their relationship that of child and mother, as if the relationship between lovers was too remote" (293). In his letters, Joyce divulges a desire to return to a state of child-like dependence on Nora, even going so far as to express a wish to enter her womb. He writes in a letter from September 1909, "Guide me, my saint, my angel. Lead me forward. Everything that is noble and exalted and deep and true and moving in what I write comes, I believe, from you. . . . O that I could nestle in your womb like a child born of your flesh and blood, be fed by your blood, sleep in the warm secret gloom of your body" (*L* II: 248). Later that year, he repeats this notion: "My little mother, take me into the dark sanctuary of your womb. Shelter me, dear, from harm! I am too childish and impulsive to live alone. Help me, dear, pay for me! Love me!" (281). For Joyce, the subjective and objective genitive of *amor matris* finds additional modalities beyond his mother and spouse, extending into nearly every facet of his life, including his experiences with prostitutes and the Catholic Church. Ellmann observes that "in the figure of the Virgin he has found a mother image which he cherished. He had gone to prostitutes and then prayed to the Virgin as later he would drum up old sins with which to demand Nora's forgiveness; the Virgin's love, like his mother's and later his wife's, was of a sort especially suited to great sinners" (294). Even Ireland—"the old sow that eats her

farrow,” as Stephen describes (*Portrait* 203)—belonged to the list of feminine entities associated with the desire that defined Joyce’s life and Stephen’s narrative hauntology, for much of Joyce’s work can be and has been interpreted as an attempt to forge an identity as a wayward son of Ireland.

As the first section of *Portrait* introduces readers to Stephen’s hauntological subjectivity, Joyce attends to the multiplicity of ways in which desire works through Stephen while refusing an absolute presence and totality of meaning. A first example may be found in the metonymic associations of Stephen’s thought that unconsciously lead back to the first narrative configuration of his desire. A definitive memory for Stephen at Clongowes is when Wells pushed him into the cesspool. Significantly, recalling this event leads Stephen’s thought to memories of his mother: “How cold and slimy the water had been! A fellow had once seen a big rat jump into the scum. Mother was sitting at the fire with Dante waiting for Brigid to bring in the tea. She had her feet on the fender and her jewelly slippers were so hot and they had such a lovely warm smell” (10). Stephen’s memory of the cesspool seamlessly transitions to his mother and her lovely smelling feet because of the *différance* of the desire haunting his subjectivity. His thoughts of falling “in [the] cess[pool]” follow his stream of consciousness to his unconscious desire for “incest,” a conclusion further supported by the fetishistic nature of his mother’s feet, which serve as a replacement for the maternal phallus. The phonetic similarities between falling “in cess” and committing “incest” represent a play of meaning and desire that is repeated during Stephen’s subsequent ruminations on the sound of the word “suck”: “Suck was a queer word. . . . But the sound was ugly. Once he had washed his hands in the lavatory of the Wicklow Hotel and his father pulled the stopper up by the chain after and the dirty water went down through the hole in the basin. And when it had all gone down slowly the hold in the basin had made a sound like

that: suck” (11). In Derek Attridge’s reading of this scene, he observes the sexual connotations of the word and sound “suck,” arguing that “words may . . . be experienced as *themselves* suffused with (unnamed and unnamable) sexual impulses, at once highly physical and beyond the control of the speaker” (*Joyce Effects* 67). Putting Stephen’s thoughts in sequence, then, his memory of falling into the cesspool leads to his mother and her feet, which quickly transitions to the dirty water (so, back to the cesspool) and the sexually-infused “suck.” This apparent diffusion of the meaning of thought that upon closer examination relates to the play of Stephen’s desire signals a nonclassical version of the subject.

In Section II of *Portrait*, Stephen’s hauntological subjectivity finds a new modality of “being” as he is redirected to a desire of a sexual other, represented by his fantasies of Mercedes and the prostitute. As Stephen grows older, he maintains the illusion that a stable, identifiable form of aesthetic subjectivity exists that he will soon be able to acquire. While listening to his elders converse, he ponders, “The hour when he too would take part in the life of that world seemed drawing near and in secret he began to make ready for the great part which he felt awaited him the nature of which he only dimly appreciated” (62). For Stephen, successfully following the path apparently laid out before him will allow him to fulfill his desire and achieve a glorious, even magical transformation. As he daydreams about consummating a union with Mercedes, “They would be alone, surrounded by darkness and silence: and in that moment of supreme tenderness he would be transfigured. He would fade into something impalpable under her eyes and then in a moment, he would be transfigured. Weakness and timidity and inexperience would fall from him in that magic moment” (65). Stephen wants to believe that his sexual desires are a sign of subjective maturity, and, once they are satisfied, he will be ushered into a world of “adult” stability. Nevertheless, his desire has not acquired a set form but rather

remains a perpetually shifting ghost-like presence, as evinced when he finds himself in his mother's bedroom, "gaz[ing] at his face for a long time in the mirror of her dressingtable" (71). Unable to leave behind the trace of his desire's relationship with his mother, Stephen is dramatically unsettled when he finds a hint of his unconscious wishes cut into a desk at Belvedere College. After spying the word "foetus" cut into a desk, "the word and the vision capered before his eyes as he walked back across the quadrangle and towards the college gate. It shocked him to find in the outer world a trace of what he had deemed till then a brutish and individual malady of his own mind" (90).

Stephen's reaction to the word "foetus" is an unconscious response to the synthesis of both wanting to enjoy the privileged position of the fetus within the mother's body and the incestuous wish to enter the mother's body sexually. In *Ulysses*, Leopold Bloom's desire is not to be the fetus in the mother's body; instead, he desires to be the mother herself carrying the fetus: "O, I so want to be a mother" (15.1817), he cries out during the "Circe" episode. Such a desire probably spawns from the loss of his son Rudy, after whose death Bloom and Molly ceased having complete sexual intercourse. Within Joyce's hauntology of the subject, life and death are intertwined. The dead are never fully absent, and the living are never fully present. In the "Proteus" episode of *Ulysses*, Stephen relies on the traces of other signs acting through a given sign to perform a play of life, death, and desire: "Bridebed, childbed, bed of death, ghostcandled. *Omnis caro ad te veniet*. He comes, pale vampire, through the storm his eyes, his bat sails bloodying the sea, mouth to her mouth's kiss" (3.396-98). Stephen's mention of the vampire, the one who "sucks," provides a point of connection with the young Stephen's interest with the word "suck." Even as an adult, the trace of Stephen's desire continues to haunt his subjectivity and determine his thought processes. As he continues to ponder the kiss, the "suck,"



in *Ulysses*, “His lips lipped and mouthed fleshless lips of air: mouth to her moomb. Oomb, allwombing tomb” (3.401-02). For Joyce, the tomb is the womb and the womb is the tomb; the womb and tomb give birth to the death of subjectivity, which thereafter remains haunted, neither dead nor alive and neither present nor absent.

Defined by the traces of desire acting through it, Joycean subjectivity requires contextualization within other subjects, or, in Derridean terms, other signs, that sustain the open-ended meaning-making process. For Derrida, the traces of other signs haunt the given sign with meaning, and Joyce enacts this dynamic in both *Portrait* and *Ulysses*. The traces of other subjects affirm Stephen’s desire and, therefore, his subjectivity through the affirming gaze. Scholars such as Kimberly J. Devlin and Gerald L. Bruns have thoroughly demonstrated the central role of the gaze in Joyce’s fiction, arguing that the other’s gaze, like a ghost’s presence, may be sensed as malicious but through its influence it sustains the subject’s desire and subjectivity itself. As Devlin explains, “While the gaze of the other may be a threat, a feared intrusion . . . an evil eye, it is also an egotistical construct, a construct of desire, whose vanishing leads to another sort of fear—a fear not of a critical other but of an indifferent other, whose stance exposes not the subject’s guilts or flaws but his potential insignificance or negligibility” (892).

While Devlin and Bruns point out an abundance of examples in Joyce’s work of this subjectivity-affirming gaze, I would like to return to Stephen’s encounter with the trace of his desire in *Portrait* when he sees the word “fetus” as an exemplary instance: “The letters cut into the stained wood of the desk stared upon him, mocking his bodily weakness and futile enthusiasms and making him loathe himself for his own mad and filthy orgies” (91). Although the letters staring back at Stephen represent a critical form of alterity, they are at least not

indifferent to his subjectivity. They thus sustain his desire without ever offering any hints at its satisfaction. When Stephen finally meets the prostitute for what he hopes will be a transformational union, “seeing her face” causes him to “all but burst into hysterical weeping” (101). While the differences between his desire of the mother and his desire of the prostitute should evince that his desire and, therefore, his subjectivity are developing, Joyce’s description of the scene clearly indicates otherwise. After the prostitute diminutively calls him a “little rascal,” Stephen “wanted to be held firmly in her arms, to be caressed slowly, slowly, slowly. In her arms he felt that he had suddenly become strong and fearless and sure of himself. But his lips would not bend to kiss her” (101). The question of the mother’s kiss introduced in Section I is revised in Section II as the prostitute’s kiss. Like a ghost, which does not change with the passage of time and experience, the meaning of Stephen’s subjectivity remains a trace without origin or goal and derived from the alterity of other subjects surrounding him.

In Section III of *Portrait*, Stephen’s desire is again reconfigured due to the play of its *différance*. The maternal, incestuous dimensions of his desire are maintained, however, as he looks this time toward the Virgin Mary, a religious other, for fulfillment. As before, Stephen requires the critical gaze of this new form of otherness to grant his subjectivity a sense of meaning. As he prostrates himself before her image, “Her eyes seemed to regard him with mild pity; her holiness, a strange light glowing faintly upon her frail flesh, did not humiliate the sinner who approached her. If ever he was impelled to cast sin from him and to repent the impulse that moved him was the wish to be her knight” (105). The impulse moving Stephen is an indicator that his desire is at work, compelling him toward a goal that he cannot reach. His wish to be “her knight” also bears sexual connotations, as does his mention of his soul “reentering her dwelling” after “his body’s lust had spent itself” (105). Interestingly, Stephen genders his soul female, and

its entrance into his body suggests a form of sexual intercourse in which the male and female roles are reversed, one that could produce the fantasy of a male pregnancy. In *Ulysses*, while Buck Mulligan jokes about male pregnancy—"I am big with child. . . . Let me parturiate!" (9.875-77)—the topic is much more serious for Bloom. After proclaiming his desire to be a mother in "Circe," Mrs. Thornton, the midwife who helped deliver the Blooms' children, helps Bloom deliver his imaginary ones: "*Bloom embraces her tightly and bears eight male yellow and white children*" (15.1821-22). Although Stephen never expresses such explicit wishes to bear children, his description of being penetrated by his feminine soul hints that such thoughts may likewise reside in his mind. Since Mary remains transcendent over Stephen's subjectivity, he finds an earthly surrogate for his desire in Emma Clery before whose gaze he may once again prostrate himself: "God and the Blessed Virgin were too far from him: God was too great and stern and the Blessed Virgin too pure and holy. But he imagined that he stood near Emma in a wide land and, humbly and in tears, bent and kissed the elbow of her sleeve" (116). As perceived objects of desire haunting Stephen's subjectivity through the traces of their alterity, Mary and Emma act as witnesses to Stephen's desire in whose eyes he must only, in his mind, justify and prove himself to be made complete.

In Section IV of *Portrait*, Stephen's illusion of completeness continues as the alterity working through him acquires a different form. Although the object of Stephen's desire is different, his routine of imagining a transformation and thereby achieving a totality of meaning persists. After rejecting the clergy's pressure to join the priesthood, Stephen reorients his subjectivity to an aesthetic other, which, for him, must surely be his final calling: "The end he had been born to serve yet did not see had led him to escape by an unseen path: and now it beckoned to him once more and a new adventure was about to be opened to him" (165).

Although Stephen believes that he exerts a measure of control over his desire, repeatedly expressing that he is responsible for his change in career direction, his attempts at affirmation betray a prevailing uncertainty about the meaning of his subjectivity. He reflects, “His soul had arisen from the grave of boyhood, spurning her graveclothes. Yes! Yes! Yes! He would create proudly out of the freedom and power of his soul, as the great artificer whose name he bore, a living thing, new and soaring and beautiful, impalpable, imperishable” (170). Stephen’s “yeses” in this section of *Portrait* are a precursor to Molly’s critical “yeses” in the “Penelope” episode of *Ulysses* that Derrida explores in “*Ulysses* Gramophone.” Molly, however, is more properly oriented toward her desire and accepts its open-ended play of *différance*, while Stephen remains teleologically focused. Upon seeing the girl standing in the water at the end of Section IV, he feels as if he is being penetrated yet again as his subjectivity is affirmed through the gaze of another:

Her image had passed into his soul for ever and no word had broken the holy silence of his ecstasy. Her eyes had called him and his soul had leaped at the call. To live, to err, to fall, to triumph, to recreate life out of life! A wild angel had appeared to him, the angel of mortal youth and beauty, an envoy from the fair courts of life, to throw open before him in an instant of ecstasy the gates of all the ways of error and glory. On and on and on and on! (172)

Despite the similarities between Stephen’s onward vision and Molly’s affirmative yeses, he still perceives the path before him as a means to an end, a totality of meaning, not a form of subjectivity itself. The mother who became the prostitute who became the Virgin Mary is now an angel come to earth to usher him to his destiny of a stable artistic identity.

As *Portrait* shifts into its final section, Joyce provides ample reminders that Stephen's hauntological subjectivity remains fluid, unfolding according to a play of differences and deferrals. Immediately before his mention of Thoth, the god of writers, Stephen's mind wanders to his mother and the enduring memory of her voice and face: "The inhuman clamour soothed his ears in which his mother's sobs and reproaches murmured insistently and the dark frail quivering bodies wheeling and fluttering and swerving round an airy temple of the tenuous sky soothed his eyes which still saw the image of his mother's face" (224). The inward haunting of Stephen's subjectivity becomes outwardly symbolized in this scene as his wandering thoughts come to set on the swallows swirling around him. Like the meaning of his subjectivity, they cannot be pinned down to any identifiable location: "They were flying high and low but ever round and round in straight and curving lines and ever flying from left to right, circling about a temple of air" (224). As the birds inhabit and move about the imaginary temple of air, the traces of alterity that have assumed various forms throughout each section of *Portrait* inhabit and move about Stephen's subjectivity in a manner that prevents it from achieving an identity and location. Unable to answer Cranly's questions about his love of his mother despite the apparent development he has undergone, Stephen remains plagued by a fear of the unknown, which "moved in the heart of his weariness" (225). A month before the novel concludes, his fears return to him in the form of a troubled dream: "Strange figures advance from a cave. They are not as tall as men. One does not seem to stand quite apart from another. Their faces are phosphorescent, with darker streaks. They peer at me and their eyes seem to ask me something. They do not speak" (249-50). To speak would be to give linguistic form to the answer to the question of Stephen's desire, an answer that does not exist and therefore cannot be put into language. Emerging from a cave, a common symbol for the womb, the strange figures advancing toward

Stephen are the specters of his desire that even in his unconscious state reify his subjectivity through their present-absence and the power of their gaze.

As a *Bildungsroman*, the end of *Portrait* should see Stephen at last assume the identity—the “the artist” of the title—that he set out to discover. He longs to fulfill his paternal namesake of Daedalus, so that he may become the progenitor of art and create as the stable, certain subject that he so desires to be. “Old father, old artificer, stand me now and ever in good stead” (253), Stephen proclaims in the final line. In his aspiration to become an artist by discovering the secret of his desire, Stephen aims to fulfill the roles of both mother and father in relation to himself and his work. Doing so, however, requires overcoming his past and the lingering effects of his own mother and father, from whose influences he can never fully break. Ellmann argues that in *Portrait* and *Ulysses* “Joyce seems to reconstitute his family relationships, to disengage himself from the contradictions of his view of himself as a child and so to exploit them, to overcome his mother’s conventionality and his father’s rancor, to mother and father himself, to become, by the superhuman effort of the creative process, no one but James Joyce” (*James Joyce* 299). To mother and father himself means to free himself from the effects of difference that permeate his subjectivity, which manifest themselves as desire, thereby stabilizing the ambiguity of his hauntological subjectivity. Despite his efforts, Stephen fails to reach the identity perpetually dangling before him. As Phillip F. Herring notes, “The form [of *Portrait*] must . . . be incomplete or indeterminate because its autobiographical aspect can never catch up with its fictional denouement, or Joyce might have to show us Stephen beginning to write the work of which he is subject” (172). Indeed, Stephen never discovers the secret of his desire to reach the artistic identity he pursues because if he did his subjectivity would be synonymous with the “original” artist who he would then “translate” into narrative form.

#### 4.4 Quantum Physics as Trace Structure

Joyce's approach to Stephen's subjectivity in *Portrait* provides a narrative re-presentation of the Derridean scene of writing as a trace structure. Like Derrida's concept of the sign, Stephen's subjectivity is put under erasure, crossed out as inaccurate yet maintained as legible to indicate its necessity. Rather than a classical ontological form of being, Stephen's subjectivity is constituted as a hauntology in which his narrative "being"—like the "being" of the Derridean sign—is written as a text that weaves together various traces of difference that manifest themselves through Stephen as desire. In this section, I would like to introduce an independent physical reality as a third modality of being and employ the epistemology of quantum physics to further illuminate the nature of a hauntology in relation to the hauntologies explored so far. Considering that much of quantum mechanics was developed and popularized after the publication of *Ulysses*, though quantum physics was introduced in 1900, I do not intend to make anachronistic claims about quantum mechanics having a direct impacting Joyce's work, though similar arguments exist; rather, I am interested in delineating some of the epistemological affinities between Joyce's fiction, deconstruction, and quantum physics so that I may make a larger point about the concept of being in general, namely that these three discourses subvert the classical version and suggest instead a nonclassical version that acknowledges and accounts for the unknowable.

Like deconstruction and modernist literature, the development of quantum physics demanded a complete reevaluation of previously accepted truths. Danish physicist Niels Bohr, one of the chief pioneers of quantum physics, expresses precisely this notion in his reflections on atomic physics and human knowledge:

The peculiar individuality of the quantum effects presents us, as regards the comprehension of well-defined evidence, with a novel situation unforeseen in

classical physics and irreconcilable with conventional ideas suited for our orientation and adjustment to ordinary experience. It is in this respect that quantum theory has called for a renewed revision of the foundation for the unambiguous use of elementary concepts as a further step in the development which, since the advent of relativity theory, has been so characteristic of modern science. (*Atomic Physics* 62)

Bohr's fellow quantum pioneer Werner Heisenberg echoes his call for a revision of the foundation of physics and modern science. Heisenberg writes in his later philosophical work, "The mathematically formulated laws of quantum theory show clearly that our ordinary intuitive concepts cannot be unambiguously applied to the smallest particles. All the words or concepts we use to describe ordinary physical objects, such as position, velocity, color, size, and so on, become indefinite and problematic if we try to use them of elementary particles" (114). As Bohr and Heisenberg express, quantum physics revolutionizes not only scientific epistemology but also the language used to describe and articulate human knowledge and experience. While classical physics allows an ontological approach to matter, as considered in modern physics, through which a complete description of that matter—that is, its velocity and position, or, in Derridean terms, its identity and location—can be known, quantum physics rejects the universal validity of such stable absolutism and replaces them with something radically different. Quantum physics therefore provides a scientific approach to the central issues of this chapter and may be situated comfortably alongside deconstruction and modernist literature. Understanding quantum physics as a hauntology in relation to *Portrait* and *Ulysses* also demonstrates that Joyce's presentation of subjectivity is grounded in scientific discourse as well as philosophy, thus shifting it that much closer to truth, in whatever sense the word is understood.



Similar to the ways that Derrida deconstructed the structuralist understanding of language and Joyce the traditional understanding of the *Bildungsroman*, quantum physics subverts the classical model of the universe and the position of all matter, including human beings within it. Each of these three discourses—deconstruction, modernism, and quantum physics—exposes the inaccuracy of belief systems previously held to be true and, in the process, insists upon a reconsideration of the subject holding those beliefs. In quantum physics, this challenge presented itself from the outset. Quantum theory—the more general epistemology encompassing quantum physics—began when German physicist Max Planck posited the quantum of action, which describes that energy is absorbed and emitted in discontinuous packets rather than as a continuous stream, in two seminal papers: “Entropy and Temperature of Radiant Heat” (1900) and “On the Law of Distribution of Energy in the Normal Spectrum” (1901), both published in *Annalen der Physik*. A few years later in 1905, Einstein published in the same journal another crucial paper, “On a Heuristic Point of View Concerning the Production and Transformation of Light” (1905), in which he used Planck’s quantum of action to demonstrate that light, long accepted as a wave, could also behave as a particle. In the following three decades, particles of matter would also be shown to possess wave-like properties, which led to Bohr’s theory of complementarity. Since a fundamental distinction in classical physics was between the concepts of energy and matter, revealing them to be parts of the same spectrum, a sort of one-sided, Möbius strip that turns back on itself, was highly significant. This discovery cast doubt on what was long considered to be “real” physical reality, including the subjects conceptualizing it as such. Reflecting on the initial essays of quantum physics, Sean Miller explains that “since physicists imagine themselves as a certain form of subject within the imagined world evoked by these texts, an encounter with subatomic particles as novel basic objects within that world entails

a novel conception of the subject as well” (358). I provide a more thorough history of the development of quantum mechanics in Chapter 5, but suffice it to say here that each landmark further intensified the need to reevaluate the subject of physics as much as the objects of study themselves.

Quantum physics belongs within the current discussion of hauntologies because it deals with the study of the traces of objects, not the objects themselves. In fact, rigorously speaking, the word “object” does not even apply in the classical sense because quantum particles do not meet the criteria to be objects since their velocity or momentum and location cannot be known simultaneously. Like Derrida’s sign and Joyce’s subject, the word “object” must be put under erasure (~~object~~); it is inaccurate and misleading when applied at the quantum level but necessary to conceptualize that world. Quantum physics therefore depends on the relationship between specialized measuring instruments, such as cloud chambers and special photographic plates, and the effects of the traces of particles on those instruments; the particles themselves always remain beyond human experience and observation and may consequently be deemed fundamentally unknowable. In Plotnitsky’s reading of the (anti)epistemology of Derridean deconstruction and quantum physics, he argues, with a note of caution, that measuring the traces of quantum particles may be approached analogously to Derrida’s event of writing: “It becomes quickly apparent that this scene, the scene of photographs and traces—and the photographs of traces and of traces of traces—may be seen or read, or *written*, as a ‘scene of *writing*’ in Derrida’s sense” (92). Since Derrida’s approach to writing, like Joyce’s approach to subjectivity, addresses language as a trace structure, quantum physics may likewise be said to deal with a trace structure. Conceptual affinities between deconstruction and quantum physics may therefore be employed to further illuminate the nature of both “scenes of writing.” According to Plotnitsky,

“the proximity of quantum physics to Derrida’s conceptions appears to be significant, however indirect the influence of quantum physics upon Derrida may be in textual and historical terms. . . . In both theories one deals only with traces or traces of traces—translations without the original” (95). The traces of particles such as electrons and photons, then, behave in a manner that suggest the existence of some previous “original”—like the “original” meaning of Derrida’s sign or Stephen’s artistic subjectivity in Joyce’s novels—that has been “translated” into a representation that would supposedly supplement the original entity. As Plotnitsky observes, however, the quantum experimental “scene of writing” entails a loss of knowledge of these supposedly original quantum objects as knowledge of the translations is gained and vice versa. The translations thus assume the characteristics of the Derridean specter that haunts the experimental scene as a past that has never been present and an absence that has never achieved presence.

To better explain the hauntological nature of the quantum scene of writing, I now turn to the experiments themselves. The best agenda for this discussion is to begin with the original “double-slit” experiment before transitioning to some of its later modifications. First conducted in relation to quantum physics in 1927, the double-slit experiment reveals the complementarity of quantum particles (their ability to possess mutually exclusive sets of properties simultaneously) and their uncertainty relations (knowledge of position [Derridean location] entails loss of knowledge of velocity or momentum [Derridean identity] and vice versa). In the double-slit experiment, particles like electrons or photons are “shot” at a barrier with two parallel, vertical slits behind which lies a special detector screen. Many of the particles shot at the barrier are reflected, but the energy of those that get through the slits are detected on the screen as well-defined traces of particles at particular spots. As these traces accumulate,

however, they form an interference pattern. This result is remarkable because interference is a property of waves not particles. Therefore, between the moment that the particles are shot at the screen and the moment that their energy is detected on the screen, they must somehow behave as waves after passing through the slits to create the resulting interference pattern. In Derridean terms, the traces on the detector screen represent a translation of a wave into an observable interference pattern, but the original wave that would supposedly be translated as such never technically existed.

In quantum physics, the wave characteristics that a particle assumes as it travels from the gun to the screen are described mathematically using what is called the “wave function,” denoted by the Greek letter psi ( $\Psi$ ). Reviewing the results of the double-slit experiment, quantum physicists discovered that knowing which slit any given particle travels through means that the interference pattern cannot be observed. This complementarity of two outcomes is the essence of the double-slit experiment. To explain the behavior of particles in this setting, physicists formulated what is known as the “wave function,” which is a means of mathematically representing the wave-like properties of particles after they are launched from the gun. To grossly oversimplify, the wave function describes all possible locations and velocities of the particle at each moment in the experimental scene as it travels to the screen as well as all its possible ending locations. When the wave reaches the screen, it “chooses” a final location from these possibilities and the wave function collapses, leaving only the detected trace of the original particle. The very act of detection (“registering” or “observing” may be substituted for “detection”) thus determines the state of the particle, causing the metaphysical wave of probabilities to collapse into one detected trace. As additional particles are shot at the screen, each one “lands” (or is detected) at a spot that is most probable in relation to the larger wave-like

interference pattern that is forming. For lack of a better way to put it, each particle somehow “knows” where previous particles have landed and where future particles will land and adopts its landing accordingly.

Even more remarkable, the formation of the interference pattern on the detector screen necessitates a lack of knowledge of which slit the particles traverse. If some sort of detection device is placed before or after the double slit to determine which slit a particle is about to traverse or has traversed, variations respectively known as the “which way” or “delayed-choice” double-slit experiment, the wave function collapses at that point and causes the particle to “choose” one slit or the other even if this choice must occur retroactively because the detection device was placed after the slits. In being forced to make an observable choice, the particle sacrifices its wave-like properties. Rather than forming an interference pattern on the screen, the traces of the particles simply clump together in a particle-like fashion.

The double-slit experiment demonstrates that quantum ~~objects~~ objects may behave as either a particle or a wave but never both simultaneously. Reflecting on the beam-splitter experiment, which is similar to the double-slit and used to show the same results, Bohr explains,

If a semi-reflecting mirror is placed in the way of a photon, leaving two possibilities for its direction of propagation, the photon may either be recorded on one, and only one, of two photographic plates situated at great distances in the two directions in question, or else we may, by replacing the plates by mirrors, observe effects exhibiting an interference between the two reflected wave-trains. In any attempt of a pictorial representation of the behavior of the photon we would, thus, meet with the difficulty: to be obliged to say, on the one hand, that

the photon always chooses *one* of the two ways and, on the other hand, that it behaves as if it had passed *both* ways. (*PWNB* 2: 50-51)

Bohr here articulates the nature of his concept of complementarity. According to him, a particle's ability to possess two sets of mutually exclusive properties is paradoxical; we simply cannot conceive of an object that is both discrete (particle) and continuous (wave). For Bohr, while particles can produce both types of effects in measuring instruments—particle-like, which could be individual or collective, and wave-like, which are always collective—we cannot in fact assign such properties to particles themselves. Attempts to form such “pictorial representations” always lead to contradictions and are therefore not possible. The act of interfering with one set of properties in the double-slit experiment to know more about it results in the opposing set of properties being lost.

I will expand on the epistemological implications of the double-slit experiment and their relationship to Derridean deconstruction shortly, but first I would like to review an additional modification to the experiment that further reveals how it defies the laws of classical physics. One of the challenges brought against the delayed-choice variation was that the detector placed after the slits to determine which of them a particle traversed obstructed the wave function's coherence and therefore prevented the interference pattern from forming. To determine whether this challenge was valid, the experiment was further modified so that physicists could identify which slit the particle traversed while preserving the wave function's coherence. First, a crystal was placed after the double slit that would split each particle into entangled twins each with half the energy of the original. One of these twins would travel to the detector screen to contribute to the interference pattern, while the other would veer off to an additional detector with two parts labelled “A” and “B” to denote each slit. After shooting a bunch of particles, physicists found

that even though the wave function's coherence was preserved, knowing which slit each particle traversed due to whether A or B lite up still caused the particles to clump on the final screen without an interference pattern. This result is even more amazing when considering that the experiment was set up so that the particle twin reaching the A or B detector did so *after* the other twin reached the detector screen. So, gaining any knowledge of which slit a given particle traversed stops the particle from acting like a wave even if that means retroactively changing the behavior of its twin. Furthermore, when a quantum erasure, a special device used to scramble information, was placed after the A and B detectors to destroy the just-gathered information about which slit a given particle traversed before it could be known, the interference pattern returned to the final screen.

Several important points may be extracted from the delayed-choice experiment and Bohr's subsequent reflections on its epistemological implications. With caution, these conclusions may be used to draw parallels between quantum physics, deconstruction, and Joyce's modernist fiction that will help illuminate the nuances of nonclassical being as a hauntology. First, the double-slit experiment and its variations demonstrate that at the quantum level gaining knowledge about some aspect of a quantum ~~object~~ always entails losing knowledge about another aspect of the same ~~object~~. Bohr concluded that when physicists design experiments, they must make a choice about which set of knowledge they will pursue and which they will sacrifice: "To my mind, there is no other alternative than to admit that, in this field of experience, we are dealing with individual phenomena and that our possibilities of handling the measuring instruments allow us only to make a choice between the different complementary types of phenomena" (*PWNB* 2: 26). Since complementarity describes mutually exclusive sets of properties but not the particles themselves, choosing one of these sets to know always sacrifices

revealing anything about the other. As Bohr explains shortly after, “In fact, we must realize that in the problem in question we are not dealing with a *single* specified experimental arrangement, but are referring to *two* different, mutually exclusive arrangements” (57). In Plotnitsky’s analysis of these conclusions, he points out that “Bohr’s intense occupation with the actual quantum phenomena led him to his knowledge that all our knowledge about the quantum world is subject to an irreducible loss of knowledge” (99). Indeed, Plotnitsky also gestures toward Oxford mathematician Roger Penrose, who, while reviewing the double-slit experiment, notes, “In order for the interference to take place, there must apparently be a ‘lack of knowledge’ as to which slit the particle ‘actually’ went through” (236). Quantum physics thus presents an epistemological contradiction that challenges classical ways of thinking: although knowledge may be definitive in quantum experiments, all predictions are fundamentally probabilistic.

To explain why the epistemological contradiction is only apparent and not actual, Plotnitsky employs Derrida’s “logic of supplementarity.” Juxtaposing Derrida’s view of writing alongside quantum theory, both of which behave as structures of the trace or traces of traces, translations without originals, Plotnitsky argues, “All putative origins of such trace-translations—that is, all possible representations of processes whose effects appear as traces—can only be seen as supplements in Derrida’s sense” (95). In *Of Grammatology*, Derrida approaches the supplement “as an *economic* concept” that “should allow us to say the contrary at the same time without contradiction” (179). While the word “supplement” can mean an addition from outside, it can also refer to something that supplies what is missing, in which case the supplement is already inscribed as a lack within that to which it is added. For Derrida, writing is a supplement to speech in the latter sense. According to him, the “strange structure of the supplement” is such that “by delayed reaction, a possibility produces that to which it is said to be



added on” (“Speech and Phenomena” 89). Derrida’s supplement thus implies that all origins are interpretive inferences from effects (but without classical causes), and no absolute origin exists to guarantee these inferences. If, as Plotnitsky argues, processes whose effects appear as traces behave as supplements, then each of the processes under examination in this chapter—Derrida’s writing, Joyce’s *Bildung*, and quantum experimentation—undermines the complete originality of that to which they are supposedly added, meaning that speech, subjectivity, and knowledge of the physical world independent of human interaction do not exist in the classical ontological sense. In fact, Derrida maintains throughout his work that writing is a “dangerous” supplement to speech because it exposes both speech’s inadequacy and the inadequacy of the entire tradition on which its alleged completeness and originality are based. Joyce’s *Bildung* and quantum physics may also be viewed as dangerous supplements to subjectivity and classical scientific knowledge respectively because they expose these supposed complete originals and their traditions as likewise lacking.

An additional reason why the quantum scene of writing is supplementary in Derrida’s sense rather than dealing with a distinct, independent reality is because quantum physics reveals the impossibility of observation and objective knowledge. Quantum experimentation shows that the measuring instruments used always have some effect on that which is measured, therefore placing unadulterated knowledge of the observed phenomena beyond human reach. According to Bohr, these revelations require a complete reevaluation of knowledge and experience. He writes, “We are here faced with an epistemological problem quite new in natural philosophy, where all description of experiences has so far been based upon the assumption, already inherent in ordinary conceptions of language, that it is possible to distinguish sharply between the behaviour of objects and the means of observation” (*PWNB* 2: 25). Published in 1938, Bohr’s juxtaposition

of classical physics and “ordinary conception of language” provides a crucial point of comparison between the implication of quantum physics for classical physics and deconstruction for structuralism. While quantum physics shows that the observer cannot be fully distinguished from the observed, deconstruction shows that writing, which encompasses all language including speech, can never be fully distinguished from the meaning it supposedly represents.

Derrida famously said that “there is no outside-text” (*il n’y a pas de hors-texte*), meaning that there is no original meaning that exists independently of writing that is translated or represented in writing. Considering Joyce’s fiction, the phrase might be modified to “there is no outside-subject” because the desire defining Stephen’s subjectivity lacks an original meaning that he would achieve through the process of his *Bildung*. A similar case may be found in quantum physics where there is nothing outside the experimental “scene of writing,” including the measuring instruments and the scientists using them. According to Bohr, “As soon as we are dealing . . . with phenomena like individual atomic processes which, due to their very nature, are essentially determined by the interaction between the objects in question and the measuring instruments necessary for the definition of the experimental arrangements, we are, therefore, forced to examine more closely the question of what kind of knowledge can be obtained concerning the objects” (*PWNB* 2: 25). Bohr continues to explain that the “kind of knowledge” that can be gathered from quantum ~~objects~~ implicates the gatherer of that knowledge, thus suggesting that independent analysis is impossible:

[I]t is equally important to understand that just this circumstance implies that no result of an experiment concerning a phenomenon which, in principle, lies outside the range of classical physics can be interpreted as giving information about independent properties of the objects, but is inherently connected with a definite

situation in the description of which the measuring instruments interacting with the objects also enter essentially. This last fact gives the straightforward explanation of the apparent contradictions which appear when results about atomic objects obtained by different experimental arrangements are tentatively combined into a self-contained picture of the object. (*PWNB* 2: 26)

Bohr's "self-contained picture" in which "experimental arrangements" are combined functions similarly to the text of Derrida's "there is no-outside text." Knowledge of the quantum world is therefore inseparable from the tools that measure it and those who do the measuring, meaning that the entire mechanical view of the universe dominant until the beginning of the twentieth century is not only misleading but utterly false. As physicist John Archibald Wheeler puts it, "we find that nature at the quantum level is not a machine that goes its inexorable way. Instead what answer we get depends on the question we put, the experiment we arrange, the registering device we choose. We are inescapably involved in bringing about that which appears to be happening" (185).<sup>30</sup>

Because the observed phenomenon in quantum physics always involves both the act of observation and the tools used to conduct it, assigning an independent physical reality to the phenomenon under consideration is impossible. As Plotnitsky summarizes, "at no point does quantum data reflect a reality independent of representation" (105). In Derridean terms, no original reality exists that can be translated into experimental representation and used to gain knowledge of that original. Applied to Joyce's fiction, this conclusion means that no original

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<sup>30</sup> While agreeing with Wheeler, Plotnitsky argues that this quote requires nuance: "It is important to keep in mind, however, that we cannot fully control the outcome of experiments we have arranged. Strictly speaking, what Wheeler refers to as registered (observed) phenomenon are already inferences made from traces left on photographic plates. These traces are 'always already' processed by a given interpretive economy, which defines the phenomenon of any given trace and the very concept of the trace" (101).

form of subjectivity—the “the artist” of the title—exists that can be achieved through experience and the coming-of-age process. Quantum physics, deconstruction, and Joyce’s writing also demonstrate that otherness is present in concepts of the self, non-meaning is present in meaning, and the unknowable is present in the knowable. As Derrida maintains, however, this presence manifests itself as an absence, a specter inhabiting a hauntology. Like meaning in Derridean deconstruction and subjectivity in Joyce, physical reality independent of observation in quantum physics belongs to an absolute past, a past incompatible with the present. Plotnitsky notes, “Under all conditions . . . absolute past suspends the possibility of objects existing by themselves and in themselves, interpedently of interpretation, as much as the possibility of full representation” (109). Quantum physics thus advances the epistemological implications that I have introduced first through Derrida and then Joyce, providing a scientific approach to deconstructing the ontological concept of being and revealing its hauntological nature.

#### 4.5 Joyce’s Hauntology of the Subject, Part II

As an additional trace structure, the scene of quantum experimentation provides a useful avenue through which to continue this investigation into the nature of hauntologies as it is further developed in Joyce’s *Ulysses*. By studying the behavior of the traces of particles, the specters haunting the quantum scene, as they interact with measuring instruments, quantum physics reveals that at the quantum level no independent reality separate from human experience can be accessed and studied. Instead, observers are intertwined with that which is observed, always gaining knowledge at the sacrifice of knowledge. Moreover, in studying a supposed translation of the physical world as it unfolds in scene of experimentation, quantum physics demonstrates that this translation functions as a supplement in Derrida’s sense, exposing the original that it supposed to be translating as itself false and always already lacking. This “original” world, like

the “original” meaning of speech and the “original” meaning of Stephen Dedalus’s subjectivity, belongs to an absolute past that has never been present. It haunts the present as the presence of an absence, an intrusion indicating that time is out of joint.

In *Ulysses*, Joyce continues to develop the hauntology of the subject that he began in *Portrait*. As Stephen struggles to discover the secret of his desire, he becomes embroiled in a world of ghosts and specters that further complicate his thoughts on his aesthetic identity and personal *Bildungs*. Many scholars have examined *Ulysses* as a form of ghost story.<sup>31</sup> According to Jeffrey A. Weinstock, “Far beyond the appearance of ‘actual’ ghosts, Joyce’s text is ‘haunted’ by ghosts on every level; from the microscopic level of the individual word to the macroscopic level of the text as singular object, Joyce’s text is a story about and filled with ghosts” (348). Although Weinstock discusses neither deconstruction nor quantum physics in his analysis of *Ulysses*, he does associate the text’s ghostliness with “the uncertainty and lack at the core of the human subject” (364). Among the scholars who connect this uncertainty and lack with quantum physics, M. Keith Booker has noted that Joyce as an author behaves similarly to Heisenberg’s observer, each of whom “cannot separate himself from the results of his observation” (581).<sup>32</sup> By weaving himself into the scene of writing, Joyce participates in what Booker calls a “philosophy of limitations,” a concept that implicates Joyce in the epistemological revolutions of both quantum physics and deconstruction. Booker explains, “The philosophy of limitations acknowledges that no final ‘truth’ can be reached either by science or by art, just as the reflexivity of modern mathematics and of modernist language acknowledges that there is no

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<sup>31</sup> See Benstock and Cixous (*The Exile of James Joyce*) for some of the first discussions of *Ulysses* and ghosts dating from the 1970s. Their work has help lay the path for subsequent scholarship.

<sup>32</sup> See Salvadori and Schwartzman and Whittaker and Jordan for additional readings of *Ulysses* and quantum physics, though the latter pair mainly criticize the former (and rightly so) due to the superficiality of Salvadori and Schwartzman’s research and conclusions.

ultimate ‘reality’ to be represented by either” (585). Joyce does indeed undermine the existence of an independent, ultimate reality in *Portrait* through his depiction of Stephen’s desire, which places a strict limit upon what he can learn about himself as an aesthetic subject. Rather than examining the holistic plot of *Ulysses*, I would like to focus on the “Scylla and Charybdis” episode in which Stephen, as Buck Mulligan describes, “proves by algebra that Hamlet’s grandson is Shakespeare’s grandfather and that he himself is the ghost of his own father” (1.555-57). While the mention of Shakespeare’s *Hamlet* already provides a connection with Derridean deconstruction, since King Hamlet features prominently in *Specters of Marx*, the apparent oxymoronic nature of Stephen’s argument allows an additional comparison with the (il)logic of quantum physics. In his discussion of *Ulysses* and quantum physics, David Overstreet observes that the “oxymoron’s technical value derives from its ability to overcome dichotomies created by Western (Cartesian) thought” (37). By examining Stephen’s discussion of Shakespeare and paternity in *Ulysses* in light of deconstruction and quantum physics, I argue that it serves as microcosm of his journey toward the ever-elusive meaning of his subjectivity and further casts doubt on the knowability of an original historical reality.

While ghost stories are first mentioned in the “Nestor” episode when Stephen’s students ask him to tell them one, Joyce does not provide the actual exposition of the Stephen’s ghost story until “Scylla and Charybdis” when he deconstructs the concept of an original meaning using logic akin to Derrida’s hauntology. “He will have it that *Hamlet* is a ghoststory” (9.141), John Eglinton, one of Stephen’s interlocutors, prompts Stephen while they debate in Dublin’s National Library. In what follows, Stephen is symbolically associated with Scylla, the six-headed monster that consumed members of Odysseus’s crew. Each of Scylla’s six heads is represented by a different participant in the debate against Stephen, including Stephen himself because he

later states that he does not believe his own argument. In mythology, Scylla also sat upon a rock, which is likened to the Aristotelian dogma to which Stephen adheres, as well as the Catholic Church. The Stephen-Scylla-Aristotle-rock chain of associations is set in opposition to Charybdis, the mythological whirlpool. The disorienting effects of Charybdis are linked to Plato and his belief in the essence of “true” forms, a philosophical approach that Stephen’s interlocutors adopt. Plato’s “true” forms are akin to the concept of the “original” that Derrida targets in his deconstructive project. Therefore, as the debate begins, Stephen is not simply arguing against a different type of thinking or a different theory of Shakespeare; instead, he is deconstructing the concept of a “true” interpretation of *Hamlet* and, by extension, the existence of original historical truth.

Stephen begins his argument with this definition of a ghost: “One who has faded into impalpability through death, through absence, through change of manners” (9.147-49). Don Gifford points out that Stephen first provides a nominal definition that will evolve into an essential definition according to Aristotelian logic (199). Stephen then presents his argument as if he were about to stage a performance, noting, “The flag is up on the playhouse by the bankside” (9.155). His staging of the following argument functions like the Derridean scene of writing and the scene of quantum experimentation insofar as it interrogates the supposed existence of an original truth via its alleged translation. In this case, the “original” under examination is the original meaning of Shakespeare’s *Hamlet*, including who the characters are based on historically and what the King Hamlet-Hamlet-Gertrude dynamic really *means*. Stephen’s argument itself fulfills the role of the translation. Like speech in relation to writing and quantum experimentation in relation to physical reality, Stephen’s translation of history is

exposed throughout the course of the episode as a dangerous supplement in the Derridean sense that reveals the original, “superior” truth of *Hamlet* to itself be inscribed with lack.

Commenting, “The play begins” (9.164), referring to both the start of his argument and the start of *Hamlet*, Stephen presents his first point: “It is the ghost, the king, a king and no king, and the player is Shakespeare who has studied *Hamlet* all the years of his life which were not vanity in order to play the part of the spectre” (9.164-68). Stephen imagines a past in which Shakespeare played the role of King Hamlet’s ghost in the first production of *Hamlet*, a past that he believes to be true. He continues, “To a son he speaks, the son of his soul, the prince, young Hamlet and to the son of his body, Hamnet Shakespeare, who has died in Stratford that his namesake may live for ever” (9.171-73). Stephen then wonders if Shakespeare may be “a ghost by absence” because he lost his first and only son, “a ghost by death, speaking his own words to his own son’s name” (9.174; 9.175-76). He concludes, “you are the dispossessed son: I am the murdered father: your mother is the guilty queen, Ann Shakespeare, born Hathaway” (9.179-80). So, in this first reading, Stephen equates Shakespeare with the ghost of King Hamlet, the deceased Hamnet with Hamlet, and Ann Hathaway with Gertrude. While this interpretation changes throughout the episode, it reflects Stephen’s initial thoughts paternity, maternity, and marital fidelity.

“Scylla and Charybdis” soon shifts into Stephen’s mental explorations of the concepts of discontinuity and the transmutation of identities that will redefine his views of the familial roles in *Hamlet*. As he debates, Stephen remembers that he owes a pound, which he spent on a prostitute, to A. E., the Irish poet George Russell. In contrast to Stephen’s Aristotelian dogma, Russell adheres to a Platonic form of mysticism that associates his character with the structuralist concept of original meaning. Stephen begins to consider his identity in terms of discontinuity and



difference, a crucial avenue for his thought that will later lead him to a different understanding of Shakespeare and *Hamlet*. He notes, “Molecules all change. I am other I now. Other I got pound” (9.205). Stephen’s current identity differs from his identity when he was lent the pound: “I, I and I. I” (9.212). This transition from continuity to discontinuity causes Stephen to transform his “I”s into a riddle: “A. E. [Russel] I. O. U. [a pound]” (9.213). As Stephen and Eglinton squabble over the historicity of Hathaway and her alleged infidelities, Stephen ruminates on the Egyptian god Thoth once again before countering Eglinton’s claim that Shakespeare must be Hamlet with a powerful comment about the interweaving of difference and the effects of this alterity on artistic identity: “As we, or mother Dana, weave and unweave our bodies, Stephen said, from day to day, their molecules shuttled to and fro, so does the artist weave and unweave his image. And as the mole on my right breast is where it was when I was born, though all my body has been woven of new stuff time after time, so through the ghost of the unquiet father the image of the unliving son looks forth” (9.376-81). Stephen’s thoughts about the perpetual weaving of otherness evoke Joyce’s depiction of Stephen’s desire in *Portrait*, which, as I showed earlier, expresses a hauntological form of subjectivity defined by the play of differences and deferrals that prevent Stephen from acquiring the stable meaning he believes he can reach. In the “Scylla and Charybdis” episode of *Ulysses*, Stephen’s explanation of the historical “truth” of Shakespeare’s *Hamlet* is likewise revealed as hauntological in Derrida’s sense because it emerges from a similar weaving of, as Stephen puts it, “new stuff time after time.” In his interpretation, the living Shakespeare is the “ghost of the unquiet father” and his deceased son Hamnet is the “image of the unliving son.” The son is supposed to look to the father as the original image he is supposed to emulate. However, in this case, the father is a ghost, so the son

must look *through* the father rather than *at* him. In other words, a stable original does not exist that would provide a model for the filial translation.

In the next lines of Stephen's statement, he employs a logic in which time, as it is in deconstruction, quantum physics, and *Hamlet*, is out of joint. He explains to his audience, "In the intense instant of imagination, when the mind, Shelley says, is a fading coal, that which I was is that which I am and that which in possibility I may come to be. So in the future, the sister of the past, I may see myself as I sit here now but by reflection from that which then I shall be" (9.381-85). Stephen's twisted wording about time and identity shed light on the dynamics of his desire in *Portrait* and the continued delayed and differed meaning of his aesthetic subjectivity in *Ulysses*. His comment about "that which I was" suggests he is thinking of an origin, a past that was at one time present. The fairy-tale opening of *Portrait*, however, displaces "that which Stephen was," his origins, to a mythical past that has never been present. This form of difference separating Stephen's identity from what it was in an absolute past manifests itself in his present—"that which I am"—and continues to define his future in terms of probability—"that which in possibility I may come to be." As a hauntological subject, Stephen perceives the possibilities of the future returning to haunt the present so that he may see himself "by reflection from that which then [he] shall be." From the son's point of view, whether the son be Stephen, Hamlet, or otherwise, the father symbolizes the future of his identity, the preexisting "original" to which the son is supposed to aspire. In the son's attempts to overcome his deficiencies as the inferior "translation" of the father, however, the son discovers that the displacement of his origins to an absolute past means that the father returns to the son as a ghost rather than a stable entity. The "original" identity and meaning to which he aspires is thus exposed through the process of translation to itself be a translation of an original that does not exist. Stephen therefore

interprets his subjectivity as a moment of coalescence of the past, present, and future, all of which are ghostly translations without stable, original meanings. Because Stephen strives to be an artist, a father of art, his hauntological subjectivity can only produce hauntological art, art in which difference is woven together and no stable, certain meaning is possible.

Stephen's exposition of the historical "meaning" of Shakespeare's *Hamlet* continues, gradually becoming a parody of itself, as he notes Shakespeare wrote the play shortly after his own father's death: "A father, Stephen said, battling against hopelessness, is a necessary evil. He wrote the play in the months that followed his father's death" (9.828-29). So, if Shakespeare is already playing the ghost of King Hamlet and now he is identified as the dispossessed son, then he must fill the role of both the ghost and Hamlet in the play's production. Complicating the situation further, Shakespeare is also the father of Hamnet, the deceased son, who, in Stephen's first reading, was represented by Hamlet. Therefore, Shakespeare must be simultaneously the father, the son, and the ghost, exemplifying the transmutation of identities. Because Shakespeare plays all these parts, he also plays none of them because they all represent some form of a translation that lacks an original that can be represented. As Stephen notes of paternity, "Fatherhood, in the sense of conscious begetting, is unknown to man. It is a mystical estate, an apostolic succession, from only begetter to only begotten" (9.837-39), and "Paternity may be a legal fiction. Who is the father of any son that any son should love him or he any son?" (9.844-45). If paternity itself is a legal fiction unknown to man, that is, a translation without an original, then how can the son, who is supposed to be the translation of the original father, ever achieve the actual identity of the father? Even in *Portrait*, Stephen understands that his father is both everything and nothing, a plethora of identities but none of them. As he responds to Cranly's inquiry about "what" Stephen father "was," "A medical student, an oarsman, a tenor, an amateur

actor, a shouting politician, a small landlord, a small investor, a drinker, a good fellow, a storyteller, somebody's secretary, something in a distillery, a taxgatherer, a bankrupt and at present a praiser of his own past" (241). As Shakespeare is the father, son, and ghost in *Hamlet*, so also is Stephen's father a transmutation of this list of identities, a list of translations without originals. In his hauntological form of subjectivity, Stephen seems to understand that he himself, as a father to his own art, can never actually produce something with absolute meaning, representative of absolute truth. Instead, he can only produce hauntological offspring, texts defined by the interweaving of difference, in which meaning is continuously deferred and delayed.

Toward the end of "Scylla and Charybdis," Stephen's argument is exposed as a dangerous supplement in Derrida's sense to the very meaning that he is supposedly translating. As an allegedly inferior addition to an allegedly superior original, the supplement should, as the name denotes, add something to the original and correct whatever may have been lacking. Instead, as Derrida argues, the supplement reveals the original—as writing does for speech—to be inscribed with lack and therefore of a supplementary nature itself. In the traditional *Bildungsroman*, the son was supposed to act as a supplement to his father; the son is inferior compared to the father, but the son also adds something to the father to elevate his paternal standing. In Joyce's hauntology of the subject, however, Stephen understands that the son reveals the father figure to be incomplete. He argues, "The son unborn mars beauty: born, he brings pain, divides affection, increases care. He is a new male: his growth is his father's decline, his youth his father's envy, his friend his father's enemy" (9.854-57). For Stephen, then, the son is a dangerous supplement to his father because his maturation exposes the superficiality of the original from which his identity is supposedly derived. The father, therefore, is always already

supplementary. Stephen mentions Sabellius, who “held that the Father was Himself His Own Son” (9.862-63), before poking fun at the idea that Shakespeare is the original father of his works by calling him “Rutlandbaconsouthamptonshakespeare,” a mashup of multiple historical figures identified as possible ghostwriters for Shakespeare, “or another poet of the same name” (9.866-67). The historical subject of Shakespeare, the original “father” of Shakespeare’s works who alone possessed their original meaning, is therefore a trace structure haunted by that which he is not. As Stephen explains, “he was not the father of his own son merely but, being no more a son, he was and felt himself the father of all his race, the father of his own grandfather, the father of his unborn grandson who, by the token, never was born” (9.867-70). Stephen’s argument thus concludes with a paradox without meaning. Shakespeare is both the father and son, the original and the translation, but also neither father nor son. For Stephen, however, this hauntological paradox of meaning is the only type of meaning possible when trying to translate the original meaning of history.

Significantly, when Eglinton asks Stephen if he believes his own theory, Stephen flatly replies, “No” (9.1067). The complicated debate that preceded was therefore simply an act of mental masturbation. Joyce proceeds to add another layer of parody to the excavation of historical meaning as the final portions of the debate in “Scylla and Charybdis” become dominated by Buck Mulligan’s play about masturbation. Mocking the idea that the artist is the father giving birth to his creation, Mulligan exclaims, “Wait. I am big with child I have an unborn child in my brain. Pallas Athena! A play! The play’s the thing! Let me parturiate!” (9.875-77). The juxtaposition of Mulligan’s masturbation play alongside Stephen’s analysis of Shakespeare offers another point of comparison with Derrida’s metaphysics of presence. In Derrida’s view, the supplement serves to conjure absence as a presence; through its very

existence, the supplement indicates that the original to which it is added is missing something that the supplement provides. For Derrida, writing serves as a supplement to speech in the same ways that masturbation is a supplement to sexual intercourse. According to him,

The supplement has not the only power of *procuring* an absent presence though its image; procuring it for us through the proxy [*procuration*] of the sign, it holds it at a distance and masters it. For this presence is at the same time desired and feared. The supplement transgresses and at the same time respects the interdict.

This is what also permits writing as the supplement of speech; but already also the spoken word as writing in general. (original emphasis; *Of Grammatology* 155)

The supplement therefore conjures what it is not; it desires what it conjures but fears what the conjuration will reveal. Derrida continues to critique the idea that the supplement can behave as a pure presence that is added to a pure absence in the original. For him, the supplement is annulled as supplement when it is considered in such terms because supplementary addition is itself a myth. He argues,

metaphysics consists of excluding non-presence by determining the supplement as *simple exteriority*, pure addition or pure absence. The work of exclusion operates within the structure of supplementarity. The paradox is that one annuls the addition by considering it a pure addition. *What is added is nothing because it is added to a full-presence to which it is exterior*. Speech comes to be added to intuitive presence (of the entity, of *essence*, of the *eidos*, of *ousia*, and so forth); writing comes to be added to living self-present speech; masturbation comes to be added to so-called normal sexual experience; culture to nature, evil to innocence, history to origin, and so on. (original emphasis; 167)

For Joyce, Stephen's argument is a supplement to the historical meaning of Shakespeare's *Hamlet* in the same way that Mulligan's masturbation play is a supplement to Stephen's argument. Through the very fact that they can supposedly be added to the original to supplement a lack, these supplements expose the originals as themselves lacking, haunted by a present absence, and thus also supplementary structures.

#### 4.6 Conclusion

Through Stephen's argument about Shakespeare in *Ulysses*, Joyce deconstructs the concept of an absolute historical truth. In the process, he reveals that translations or representations of supposedly independent original truths behave as Derridean supplements that expose those originals as inscribed with difference. Nestled within Stephen's exposition is another allusion to Thoth, the ancient Egyptian god of writing and the dead, that not only performs the deconstructive implications of his thought process but also provides an additional trace that connects *Ulysses* to a skepticism regarding classical epistemologies. As Stephen delineates his theories of Shakespeare, ghosts, and paternity, he comments, "Coffined thoughts around me, in mummycases, embalmed in spice of words. Thoth, god of libraries, a birdgod, moonycrowned. And I heard the voice of that Egyptian highpriest. *In painted chambers loaded with tilebooks*" (original emphasis; 9.352-55). As with his allusion to Thoth in *Portrait*, Stephen's thought in this passage is not original. Instead, he is repeating a phrase—"I heard the voice of that Egyptian highpriest" (original emphasis; 7.838-39)—that he heard earlier in the day at the newspaper office in the "Aeolus" episode. Furthermore, Richard Bliss has identified Stephen's remark about the "painted chambers loaded with tile books" as belonging to Richard Jefferies's *The Story of*

*My Heart: My Autobiography* (1898).<sup>33</sup> Therein, Jefferies rejects the historical emergence of culture and literacy, questioning, “Can any creed, philosophy, system, or culture endure the test and remain unmolten in this fierce focus of human life?” (101). Through wordplay and allusions, Joyce thus leads his audience from his aspiring protagonist to a challenge against the authenticity of absolute forms of meaning.

Stephen’s thoughts about Thoth provide yet another example of the ways in which Joyce plays with the notion of texts and textual hauntings. While *Ulysses*’s extreme intertextuality makes it an easy text to label as haunted, I have shown throughout this chapter that Joyce extends this treatment to his depiction of Stephen’s subjectivity and the concept of historical truth. As with Derrida’s sign, Joyce’s subject is a text that results from the interweaving of difference, an interweaving of alterity that haunts the subject with that which he or she is not. Through Stephen’s argument about Shakespeare in *Ulysses*, Joyce demonstrates the concept of historical truth is likewise already a paradoxical translation of an original that does not exist. In doing so, Joyce’s thinking anticipates the (il)logic of quantum physics and Derrida’s deconstructive project, both of which target the concepts of absolute presence and independent truth. Among other modernist authors, Joyce’s work is crucial to the development of nonclassical thought because he provides narrative platforms on which he performs the epistemological shifts from continuity to discontinuity and identity to difference. In his struggles to use his art to create original meaning while simultaneously critiquing the very existence of original meaning, Joyce manages to situate himself as a specter in his own work, haunting his texts with a meaning they cannot achieve. Jean-Michel Rabaté notes, “To haunt signifies to ‘frequent’ a place, to inhabit it frequently, but to do so in the mode of an obsessive absence, of nameless remorse, and the

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<sup>33</sup> Joyce biographer Richard Ellmann has pointed out that Joyce owned a copy of *Richard Jefferies: His Life and Work* in his Trieste library (*Consciousness* 130).



haunted poet struggles against the commonplaces of a ‘quotidian’ that appears all the more evanescent as it expects the return of the anguishing spirit” (*Ghosts* 4). Like the ghost of King Hamlet, Joyce indeed continuously returns to haunt his own work. As he does, his ghostly presence allows his texts to reside within the liminal space between binaries and provides subsequent authors with a model for understanding the epistemological implications of a hauntological subjectivity and a haunted modernity.

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## CHAPTER 5. VIRGINIA WOOLF AND A CLIMATE OF UNCERTAINTY

### 5.1 Introduction

On 1 October 1938, less than a year before the outbreak of World War II, Virginia Woolf wrote in her diary, “its odd how susceptible the mind becomes to weather symbols—roping everything in—in crises like this is, or was. Of course there’s bound to be a turn against relief—but I’m watching the storm—as in violent illness” (*DV*: 178). As England faced the uncertainty of another world war and its consequences, Woolf’s mind increasingly turned to weather symbols as a means of processing and expressing the historical, socio-cultural, and personal intensity of the period. This shift in her thought and the events leading to World War II coincided with the development and popularization of quantum physics, which represented a new paradigm of scientific epistemology in which uncertainty held a fundamental position. In this chapter, I approach uncertainty as a point of intersection for England’s prewar anxieties, Woolf’s mental turn toward the weather, and quantum physics. Particularly, my interest lies in the influence that this climate of uncertainty had on Woolf during the final years of her life and the ways in which she uses depictions of the weather in *The Years* (1937) and *Between the Acts* (1941) to explore the implications of the shifting epistemological landscape.

Within the last few decades, a fruitful body of scholarship addressing Woolf’s affinity for science has emerged to help illuminate the overlap of her thoughts on writing and the content of her prose with important advances in contemporary science.<sup>34</sup> Woolf was certainly aware of popular expositions of the new physics, namely relativity theory and quantum theory, circulating

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<sup>34</sup> See Dalgarno and Henry for studies of Woolf’s cosmology and the impact of developments in photography and astronomy, and Alt and Scott for analyses of Woolf’s work in relation to the life sciences and nature.

throughout Britain in the early twentieth century through her relationship with Bertrand Russell and the overall prevalence of science in popular culture. Evincing her interest, she directly refers to figures such as Albert Einstein, Arthur Eddington, and James Jeans in both her fiction and nonfiction writings.<sup>35</sup> Along with Einstein, Niels Bohr, Werner Heisenberg, and a few others were crucial to the development of quantum physics during the 1920s. This radically different scientific theory revealed the fundamental uncertainty inherent in physical reality and our interactions with it, and thus human experience itself. As she learned about the new physics, the quantum concepts of probability, loosely defined as a form of knowledge in which uncertainty mingles with certainty, and uncertainty resonated with her thoughts on the complexities of modern fiction and daily life, especially as the world inched closer to war. The importance and unpredictability of the weather in her novels intensified as she honed her craft in the 1930s and increasingly came to symbolize the role of uncertainty and its inevitable consequences for the nation's future.

While some scholars have examined the similarities between Woolf's work and Einstein's theories of relativity, others have chosen to focus on the ways that the ideas and rhetoric of quantum physics seeped into her views of writing to reinforce or modify preexisting ideas while also cultivating new ones. Gillian Beer, for example, in her early analyses of Woolf and science, argues that "for Woolf in the 1930s the language and ideas of the new physics helped to provide pathways out of the impasse of realist fiction," noting especially that "physicists did not simply introduce ideas to her; rather, their insights and their language coalesced with hers" (113). Ann Banfield likewise emphasizes the dialogic nature of Woolf's

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<sup>35</sup> For example, Einstein's name appears in *Mrs. Dalloway* (28), her essay "Memories of a Working Women's Guild" (152), and her diary (*DIII*: 68; *DV*: 146); Jeans's name appears in her diary (*DIII*: 340; *DIV*: 65); and, Jeans and Eddington are both mentioned in *Between the Acts* (20).

relationship with quantum physics, adding to the discussion the influence of physicists like Heisenberg, Louis de Broglie, and Erwin Schrödinger, and she additionally contends that physics provided Woolf with a more valid epistemological worldview. According to Banfield, Woolf's philosophy "addressed the seeming incommensurability of two versions of a knowledge of the external world, one direct apprehension of it through the senses and the other scientific knowledge, chiefly modern physics . . ." (6). More recently, Rachel Crossland observes that both Woolf and D. H. Lawrence in their reading about the new physics "seem to have assimilated into their literary works certain ideas from their reading, finding that the direction in which science was moving during this period reflected in some way the direction of their own thoughts" (11). While other scholars have addressed these and related issues, this chapter provides an overview of the extent to which Woolf's thought anticipated and eventually merged with some of the concepts and intricacies of quantum physics as she explored the nature of subjectivity and human experience.<sup>36</sup>

Despite the expanding body of research investigating Woolf's relationship with quantum physics, scholars have largely overlooked the importance of her depictions of the weather as they relate to the increasing prevalence of uncertainty in cultural discourses.<sup>37</sup> By addressing this topic, I aim to demonstrate the impact of the popularization of quantum uncertainty and the impending war on Woolf's conceptualization of the weather in her fiction of the late 1930s. Woolf, of course, incorporated uncertainty in her earlier work, using the narrators of novels such as *Jacob's Room* (1922), *Mrs. Dalloway* (1925), and *To the Lighthouse* (1927) to develop what Herta Newman calls "a realism of uncertainty." According to Newman, a central concern of

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<sup>36</sup> For a few additional relevant studies, see Yom, Stockton, and Brown.

<sup>37</sup> The only pieces of scholarship to focus exclusively on the weather in Woolf's writing are Maggio's pamphlet and Sriratana's presentation, though neither mentions physics.



Woolf's storytelling is that "life is uncertain, character impenetrable, that fiction must struggle with these conditions without assurance of success" (19). As Woolf refined her writing style, her conceptualization of uncertainty synthesized with contemporary popularizations of quantum physics by scientists like Eddington and Jeans that emphasized the role of uncertainty in determining the nature of physical reality and human experience. For modernists like Woolf during the later phases of the movement, fiction served as a staging ground for exploring the repercussions of these scientific discoveries as they emerged alongside the socio-political angst and suspense of the decade before World War II. According to Tyrus Miller, writing of this period "coheres as a distinctive literary 'type' within the historical development of modernist literature, serving as an index of a new dispensation, a growing skepticism about modernist sensibility and craft as means of managing the turbulent forces of the day" (20). By situating Woolf's *The Years* and *Between the Acts* within this index of cultural turbulence, I contend that the weather becomes for her a means of grappling with the surging pervasiveness of uncertainty and exploring what it might mean for her craft and country.

The chapter begins with an overview of the history of weather forecasting in Britain before turning to Woolf's descriptions of the weather in her diary and essays. While her earlier writing reveals a distinct interest in the weather as part of her theorization of the seemingly mundane and ordinary, her exposure to the popularization of quantum physics in the late 1920s and early 30s and the rise of fascism in Europe caused her to attribute to the weather new scientific and cultural significance. To further discern how her mental susceptibility to weather symbols manifests itself in Woolf's writing, I contextualize *The Years* and *Between the Acts* within the destabilization of science and British society during the 1930s. The use of the word "climate" in my title thus plays upon its dual meaning as both the long-term weather conditions

of a particular region and the prevailing cultural attitudes and standards of a given society. By analyzing her diary and essays along with these two novels, I argue that Woolf's thoughts on probability and uncertainty coalesce with her understanding of quantum physics and prewar anxieties. Consequently, her descriptions of the weather serve to probe the domestic implications—both in terms of modernist subjectivity and the British nation—of a climate of uncertainty as she uses her prose to engage the instability of a rapidly changing world.

## 5.2 A Brief History of Reading the Skies in Britain

Woolf's thinking about the weather belonged to a national interest in the topic that emerged during the eighteenth century and sought to not only observe, record, and study weather phenomena, but also understand the ways that they could shape human life and cultural development. When R. H. Gretton wrote his multi-volume *A Modern History of The English People* (1913), which was likely an influence on Woolf's composition of *The Years* (Snaith 395), he chose to begin by describing a personified “fog unparalleled in our annals” that “almost without intermission brooded over London from November 1879 to the following February” (15). Fog like that which Gretton describes is common in England where the climate generally consists of unpredictable short-term weather patterns that remain moderate overall yet bring consistent amounts of rain. Of the British Isles, Elaine Barrow and Mike Hulme explain, “Their maritime location, their position within the main flow of the mid-latitude westerlies and their proximity to the mild waters of the north-east Atlantic Ocean all contribute to a climate which knows little of the extremes of winter and summer typical of Moscow or the Hudson Bay, places at equivalent latitude to the British Isles” (33). The nation's temperate climate encouraged the English people to perceive themselves as the beneficiaries of an environment that seemed well

suited for their prosperity, and its susceptibility to sudden, albeit minor, fluctuations prompted them to attribute it with a personality that mirrored their own.

Although educated and wealthy citizens had been making systematic reports of the weather in the centuries prior, Jan Golinski explains that both amateur and professional investigations of the weather and climate more generally rose to prominence in England as part of the Enlightenment perspective of nature. Building on the work of Vladimir Janković, who examined the English preoccupation with weather peculiarities as evidence for the endurance of ancient meteorology, Golinski claims that “the way the weather bears upon human life is symptomatic of how nature impinges on human culture, the understanding of which is central to much of scientific and philosophical thought in the eighteenth century since” (12). During the Enlightenment, meteorology in England became a means of furthering humankind’s conquest over nature and developing a sense of collective national identity. Golinski states, “As their country took its first steps toward modernization, with burgeoning commerce and the beginnings of revolutionary growth in agriculture and industry, new ideas about the weather came to the fore, assuming a place in the beliefs of a people increasingly confident of their destiny as a civilized nation” (2). Remarkable eighteenth-century events such as the great storm of 1703, which is mentioned in *Between the Acts* (8), and the summer haze of 1783 spurred a rapid growth in the number of citizens purposefully observing the weather, even the seemingly trivial wind, clouds, and precipitation of everyday life, and recording their observations in personal weather journals. Over the years, Golinski notes, British investigators “built up comprehensive annals of the weather in their own locality in an attempt to discern long-term patterns” (4). While officially establishing meteorology as a national science would take another century and more, the

Enlightenment approach to knowledge and the era's concern with humankind's place in nature laid the foundation and intertwined the weather with a budding national consciousness.<sup>38</sup>

Despite the efforts of a growing number of individuals in the eighteenth century, England struggled to develop a more large-scale system of meteorology. According to John Kington, “the application of purely statistical methods to the analysis of standardised weather data had not resulted in the hoped-for breakthrough in understanding atmospheric behaviour. The key that eventually opened up the way to further progress was the mapping of observations over a large area so as to give a synoptic view of the general weather situation” (143). To accomplish this task, England founded the Meteorological Department of the Board of Trade—the first official British meteorological service—in 1854 and appointed Robert FitzRoy as Head. FitzRoy had already made a name for himself after working as the captain of the HMS Beagle (of Darwinian fame) and the second governor of New Zealand, and he used his maritime expertise to help usher in a modernized approach to meteorology. Fitzroy worked to coordinate preexisting observation stations scattered throughout western Europe while also increasing their number and the scope of their surveillance (Kington 144). Furthermore, he supported an egalitarian approach to studying the weather, offering these words of encouragement to amateur observers in his *The Weather Book* (1863): “This small work is intended for many, rather than for few, with an earnest hope of its utility in daily life. The means actually requisite to enable any person of fair abilities and average education to become practically ‘weather-wise’ are much more readily attainable than has been often supposed” (B). FitzRoy is also credited with coining the phrase “forecasting weather,” which he defined as “a practical application of meteorological science tending to its utilisation in daily life” (88).

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<sup>38</sup> For an additional analysis of the weather's relationship to cultural development, see Lee.

By gathering reports from ships' captains, lighthouse attendants, and private individuals in addition to those from official observation points, FitzRoy initiated the practice of issuing daily weather forecasts and storm warnings (Kington 147). Although he worked to chart exact patterns of the weather, FitzRoy also respected that its unpredictability set it apart from other objects of scientific study, a characteristic that would strongly resonate with Woolf. FitzRoy wrote, "Meteorology can never be an *exact* science, like Astronomy, because its elements are incessantly changing, in *nature* as well as quantity; but it does not therefore require a merely superficial degree of attention" (vii-viii). FitzRoy's emphasis on the uncertainty intrinsic to the weather's behavior is a crucial facet of his contributions to the history of British meteorology. If the nation's weather was wrapped up in the development of its collective identity, then so also was the uncertainty that accompanied weather forecasting. After FitzRoy's death in 1865, British meteorology continued along the path of modernization as the Meteorological Department worked to expand and coordinate observation points across the British islands and European mainland and began installing autographic instruments through the end of the century and into the next.

### 5.3 The Weather in Woolf's Diary

When Woolf was born in 1882, British meteorology was nearly an established, official practice of the national government. Like many of her fellow citizens, she was interested in observing the weather and sought to understand its effects on human life and behavior, a theme that she frequently explores in her diary. Written in thirty books from 1915 until a few weeks before her death in 1941, Woolf's diary provides a revealing glimpse into how she perceived the weather, its unpredictability, and its association with contemporary events. Along with her other non-fiction writings, Woolf's diary has been lauded for exemplifying "the new form for which Woolf

was searching throughout her career” and demonstrating “the pervasive intertextuality of all Woolf’s writing, the extensive play between art, reading, and life, and the centrality of even the most fragmentary paratexts for understanding her work as a whole” (Sellers 190; Fernald 177-78). Woolf’s diary is especially important to a discussion about quantum physics and uncertainty because of the ways that her descriptions of the weather frame and permeate her challenges to traditional notions of continuous, deterministic subjectivity. According to Susan Sellers, the diary resists “expressions of a coherent self,” so “we must negotiate instead with a linguistic construct that has only a tenuous relation to its producer” (116). This textual presence, Sellers argues, “explodes conventional notions of character as a stable, coherent entity whose behavior can be predicted and made use of” (121). Indeed, in his introduction to her diary, Woolf’s nephew and biographer Quentin Bell explains that in her personal writing “she is true only to her mood at the moment of writing, and when the mood changes she often contradicts herself” (xiv). The subject of Woolf’s diary thus comes to behave with a level of unpredictability and uncertainty akin to the weather, a frequent topic of discussion throughout the volumes themselves. By examining her descriptions of the weather in her diary, I demonstrate that Woolf weaves the uncertainty of the weather into her personal explorations of daily life, subjectivity, and contemporary events, lending these three topics shades of suspense and excitement that reflect the modern environment in which they were written about.

My first means of categorizing Woolf’s engagement with the weather in her diary is as part of her fascination with the complexities of the seemingly mundane. According to Liesl M. Olson, Woolf’s modernism is “deeply invested, stylistically and ideologically, in representing the ordinary” (43), which, for Woolf, “eludes representation, or that no representation of it (no matter how experimental) can be totally satisfactory” (44). According to Woolf, a diary is an

ordinary object itself that offers an opportunity to experiment with the challenges of representing the nuances and importance of other ordinary things. As she wrote on 20 April 1919, “there looms ahead of me a shadow of some kind of form which a diary might attain to. I might in the course of time learn what it is that one can make of this loose drifting material” (*DI*: 266). Yet unformed like a cloud in the distance, Woolf’s diary incorporates the weather as a common facet of daily life whose unpredictability provides a source of pleasure. On 3 September 1918, she relates, “L. foretold a wet day by the light on our shutters, but on opening them we found a perfect September morning. The sun is thinner but very clear, & the air sparkling, now that we are past August” (*DI*: 189). Years later, Woolf includes weather in all its forms as part of a list of ordinary things that hold special importance in life: “Weather all sorts; river running; boat swimming; loud speaker, camera, Electric Light, frigidaire—thus I run through those material blessings which one ought to say make no difference. Yet they do” (*DIV*: 36). Indeed, the weather does make a difference in Woolf’s life, and, when she later expresses, “What I want is a season of calm weather. Contemplation,” she manages to find it in her surroundings: “Every sort of scenic effect—a prodigious toppling & cleaving & massing, after the sunset that was so amazing L. made me come & look out of the bathroom window—a flurry of red clouds; hard; a watercolour mass of purple & black, soft as a water ice; thin hard slices of intense green stone; blue stone, & a ripple of crimson light” (*DV*: 161). Sensing the inadequacy of language to convey the beauty of the sky before her, Woolf comments after her description, “No: that wont convey it” (*DV*: 161).

As Woolf’s diary expanded, the weather became a constant topic of reference in her appreciation of the commonplace and its inspiration for her work. She writes on 27 March 1937, “Merely scribbling here, over a log fire, on a cold but bright Easter morning; sudden shafts of

sun, a scatter of snow on the hills early; sudden storms, ink black, octopus pouring, coming up; & the rooks fidgeting & pecking in the elm trees. As for the beauty . . . too much for one pair of eyes” (*DV*: 72). For Woolf, air, sunlight, snow, storms, colors, and birds combine to create an overwhelming experience of the ordinary, one that bombards the senses and reveals the multifaceted nature of the weather. Diary entries, such as this one, suggest the weather’s likely contribution to Woolf’s famous description in “Modern Fiction” (1919) that the “mind receives a myriad impressions—trivial, fantastic, evanescent, or engraved with the sharpness of steel” that fall on us like “an incessant shower of innumerable atoms” (9). Even after hurting herself in a fall, Woolf manages to find joy in the weather: “So after dinner I walked to the Clinic with L.: waited outside with Sally tugging; watched the evening sight: oh & the purple grey clouds above Regents Park with the violet & yellow sky signs made me leap with pleasure” (*DV*: 223). The vicissitudes of the sky, with its indeterminate, ever-changing shapes, fluctuating spectrum of colors, and unpredictable precipitation, thus comes to be a crucial component of Woolf’s fascination with common aspects of daily life, providing a source of both inspiration and pleasure as she honed her writing craft.

In addition to influencing her perspective of the seemingly mundane, the weather also shapes Woolf’s understanding of subjectivity, including both her views of the human temperament and the relationship between the mind and its environment. As is well known, Woolf struggled with depression throughout most her life, eventually committing suicide in 1941, so her attentiveness to the relationship between mood and the weather in her diary is perhaps unsurprising. Indicating that suicide was intermittently on her mind, Woolf ponders on 5 January 1915, “Does the weather prompt suicide?” (*DI*: 7). This association between the weather and depression continues to surface in Woolf’s thought throughout the years, and, at times, she



collapses them into one metaphor that equates the weather with negative moods tossing her about. On 23 May 1921, for instance, she writes, “Life does this sort of thing too habitually—I begin to feel bored, like a passenger thrown from side to side of a ship. I don’t describe what I feel: something of anger at the unreason of it; & something of—not indifference, no; but as if one knew by this time how things go” (*DII*: 119). Furthermore, Woolf expresses the common belief that certain events are appropriate only in certain types of weather. Continuing the previous entry, she mentions two recent drownings only to comment that they seem unsuitable for “this fine weather” (*DII*: 119). Woolf appears most alarmed, however, when her moods fluctuate and behave as volatily as the weather, leaving her feeling helpless and alone: “We have been to Rodmell, & as usual I come home depressed—for no reason. Merely moods. Have other people as many as I have? That I shall never know. And sometimes I suppose that even if I came to the end of my incessant search into what people are & feel I should know nothing still” (*DII*: 119). While moods may behave with the unpredictability of the weather, setting them beyond the realm of epistemological determinism, sometimes the weather can engender a positive mood with an equal measure of surprise. As Woolf relates on 15 September 1925, “A walk, in pearly mottled weather, on the marshes, plunges me in love again” (*DIII*: 41).

Another factor to consider when pursuing the relationship between Woolf’s moods and the weather is her experience with repeated, often debilitating bouts of illness. Frequently needing to rest throughout her life, Woolf ruminates on the meaning of illness and its effects on the human mind and body in her essay “On Being Ill” (1930). Therein, she observes that the acute sense of embodiment that accompanies sickness seems to take its cue from the weather: “All day, all night the body intervenes; blunts or sharpens, colours or discolours, turns to wax in the warmth of June, hardens to tallow in the murk of February” (101). For Woolf, while illness

may cause the body to react to the weather, it can also transform the weather into something remarkable because it comes to symbolize an outside world inaccessible to the infirm. She describes the opportunity that those who must remain in bed have to be disinterested and appreciate the sky: “We float with the sticks on the stream; helter-skelter with the dead leaves on the lawn, irresponsible and disinterested and able, perhaps for the first time for years, to look round, to look up—to look, for example, at the sky” (104). Indeed, Woolf continues to explain that illness may reveal the sky’s resplendency because it offers a chance for unimpeded observation denied to public sky-gazers:

Now, lying recumbent, staring straight up, the sky is discovered to be something so different from this that really it is a little shocking. This then has been going on all the time without our knowing it!—this incessant making up of shapes and casting them down, this buffeting of clouds together, and drawing vast trains of ships and wagons from North to South, this incessant ringing up and down of curtains of light and shade, this interminable experiment with gold shafts and blue shadows, with veiling the sun and unveiling it, with making rock ramparts and wafting them away—this endless activity, energy, has been left to work its will year in year out. (105)

According to Woolf, the ennui of extended illness illuminates the mystery and beauty of the weather, which comes to represent all that is missed in everyday life, the “procession” as she often calls it.

A segment of Woolf’s diary from September 1917 exemplifies her theorization of the relationship between illness and the weather while also demonstrating how her illness caused the weather to become a more alluring aspect of activities beyond her ability. After suffering a

particularly intense mental breakdown in early 1915, Woolf was forced to abstain from writing for almost two years out of medical fears that it would excite and complicate her condition. In spring of 1917, however, she and Leonard purchased their printing press, and she gradually began to recover, slowly reacclimating herself to writing daily diary entries again. Woolf's lingering illness had a distinct effect on her diary when she restarted it in 1917. As Quentin Bell explains in his biography of her, "There were times when she wrote in her diary because she could not read, and when she could not read it was usually because she was nervous, cross, or in some way disturbed and wanted, as she put it, 'to write out the pain'" (45). As part of her attempts "to write out the pain," Woolf began including regular weather reports at the beginning of practically every diary entry for almost two months, a remarkable trend considering that her personal writing was uncommonly terse during this time. Consider, for example, a series of excerpts from the first ten days of September 1917: 1 September, "a perfect moonlit night, mist rain & wind, black all over the downs this morning;" 2 September, "Uncertain, windy weather, with showers in the morning; but the sun seemed to get the better steadily, & it was a fine afternoon;" 3 September, "Perfect day; completely blue without cloud or wind;" 4 September, "a perfect day, almost without wind;" 5 September, "Another fine morning;" 6 September, "A fine day;" 7 September, "A very hot, steamy day;" 8 September, "A cloud over the land all day, except late in the evening, when the sun came out beneath it in an odd way;" 9 September, "An almost motionless day; no blue sky; almost like a winter day, save for the heat;" and 10 September, "A perfect rather misty but cloudless day, still & very hot" (*DI*: 47-49). Entries like these reveal the extent to which the weather was bound to Woolf's illness and recovery. For her, reporting the weather each day likely provided a sense of stability and continuity to her tumultuous mental life, especially during times of complete breakdown. While it is daily variant

and unpredictable, the weather still provided something constant to observe and record, thus granting Woolf a measure of control over the world around her even as she lay in bed.

My final category of Woolf's explorations of the weather in her diary and an additional reason she would be so attentive to its nuances in 1917 is the ways that the weather became fused to contemporary events, specifically the sounds, sights, and feelings of war. After the German army began its campaign against England in 1915, air raids on London and the surrounding areas became increasingly common, and Woolf writes frequently about them in her diary. Perhaps unsurprisingly, the noise of the airplanes and even the guns from across the Channel merges with the noise of the weather to create a dark harmony of atmospheric sound. As Woolf writes on 5 September 1917, "Clouds brewed over the sea, & it began to rain at tea; then great thunder claps, & lightning. Difficult to distinguish thunder from guns. . . . Servants stayed at Charleston all night; say that there was gun fire as well as thunder" (*DI*: 48). More important than the auditory dimension, however, were the weather's contributions to the probability of an air raid. Since many of them occurred at night, clear weather and a bright moon made an attack more likely, whereas clouds and poor visibility could make one less feasible for the Germans. Throughout the fall of 1917, Woolf comes to understand this dynamic quite well and begins including notes about the chances of an air raid alongside brief weather reports. On 9 October, for example, she observes, "As it is a fine, fairly still evening, perhaps I shall have a raid to describe tomorrow" (*DI*: 57). However, in the next entry, she opens with a curt, "No air raid" (*DI*: 57). As the war unfolded, Woolf and her fellow Britons learned to appreciate poor weather conditions because they usually offered a brief reprieve before the next bombing. She relates on 24 October, "With time one would naturally welcome wet & wind; already the worst chill of them is over, because one thinks of them as safety against the raid. So today I hardly grumbled, thought it was heavy

rain, cold, dark, inhuman, primeval weather” (*DI*: 66). Although Woolf certainly pondered the negative effects of poor weather on her moods, wartime conditions revealed a different dimension of rain, lightning, and fog that showed that they could be beneficial as well as harmful.

#### 5.4 Woolf and the Popularization of Science

My overview of Woolf’s descriptions of the weather throughout her diary demonstrates its importance across a spectrum of her interests and concerns. On the one hand, the weather was a crucial facet of her fascination with the ordinary and became part of her celebration of the seemingly mundane details of daily life. On the other hand, the weather could contribute to and even determine the most serious aspects of life and death. Whether it caused certain moods (for better or worse), became an object of attention for the severely ill, or served as an indicator for war, the weather had a powerful impact on Woolf’s conceptualization of subjectivity and both individual and collective experience. Weather also played a crucial role during Woolf’s remarkable experience viewing the total solar eclipse of 1927, an event that scholarly literature has thoroughly explored in relation to her work,<sup>39</sup> when unexpectedly cloudy skies nearly concealed it. After Arthur Eddington dramatically confirmed Einstein’s so-called general theory of relativity during the eclipse of 1919 in South America by measuring the bending of light around the sun, England anticipated with almost boundless excitement the homecoming of the phenomenon and the opportunity to witness it firsthand.<sup>40</sup> Jane Goldman describes, “If the eclipse of 1919 was illuminating to the enlightened (scientific community), then the eclipse of

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<sup>39</sup> For scholarly analyses of the impact of the eclipse on Woolf’s writing, see Dalgarno 120-25, Henry 19-30, and Goldman 13-106.

<sup>40</sup> For overviews of the press coverage, national preparations, and celebrations of the eclipse, see Henry 19-23 and Goldman 25-29.

1927 was billed as an opportunity for ordinary people to witness the discovery and confirmation of scientific laws in a dramatic spectacle” (28). The eclipse, then, was a crucial moment for Woolf, the British nation, and physics because it brought the country together to share an experience that resonated with scientific importance.

In this section, I use Woolf’s experience of the eclipse as a springboard for a discussion about her relationship with quantum physics. After 1919, a steady stream of popular science books and periodical articles that aimed to make Einstein’s ideas accessible to non-technical audiences began appearing in England. Then, due to the work of physicists like Werner Heisenberg, Niels Bohr, Erwin Schrödinger, Max Born, Paul Dirac, and a few others, quantum mechanics emerged in 1925 as the standard formulation for atomic physics, catalyzing an increase in both the number and scope of mainstream scientific materials.<sup>41</sup> By locating Woolf within this scientific environment and examining her relationship with key texts and their presentation of the quantum concepts of probability and uncertainty, I claim that her experience with the eclipse provided the raw material for her understanding of uncertainty in nature and its effects on human experience. Her exposure to quantum physics then lent structure and support to this material, allowing her to mold it into a scientifically-grounded means of presenting uncertainty and probability in her final two novels.

During the popular science boom of the 1920s, Woolf encountered explanations of the new physics from a variety of sources, many of which were aided by advances in print and radio technologies. Her interest in science is unsurprising considering that her father, Leslie Stephen, was well read in the natural sciences and mingled with prominent Victorian scientists like T. H.

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<sup>41</sup> Scholars such as Michael Whitworth and Peter J. Bowler have thoroughly covered the history of the popularization of science in print during the early twentieth century. See their work for additional information on this topic.

Huxley and John Tyndall. After the eclipse, Einstein became a mainstream figure in England, and his ideas were actively discussed on a variety of platforms across the social spectrum. Einstein's work, along with developments in quantum physics, was made available to interested readers like Woolf through the publication of books and articles by popular science writers like Cambridge astrophysicist Arthur Eddington, Cambridge astronomer and mathematician James Jeans, mathematical logician and philosopher Bertrand Russell, and geneticist and physiologist J. B. S. Haldane. Although they varied in their methods of presentation, these scientists sought to not only explain scientific discoveries, complex physical concepts, and new cosmologies, but also explore the implications of what these ideas might mean for human knowledge and experience. In her study of Woolf's relationship with physics and astronomy, Holly Henry observes, "Fascinated with the new vistas of space, Woolf read the work of these scientists and began developing literary strategies that responded to this re-scaling, and that offered possibilities for a radical rethinking of the social and political structures of her day" (3). Key texts that were successful on the popular market and widely circulated in the 1920s and 30s included Haldane's *Daedalus; or, Science and the Future* (1924), Russell's *ABC of Relativity* (1925) and *The Analysis of Matter* (1927), Jeans's *The Universe Around Us* (1929) and *The Mysterious Universe* (1930), and Eddington's *The Nature of the Physical World* (1928), *New Pathways in Science* (1935), and *The Philosophy of Physical Science* (1939).<sup>42</sup>

Scholars such as Henry and Michael Whitworth have sketched roadmaps of cultural connections between Woolf and the new physics that demonstrate she was ensconced in an environment permeated with science. Both Whitworth and Henry point out Woolf's association with Lady Ottoline Morrell at Garsington Manor as evidence for her exposure to science.

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<sup>42</sup> Whitworth's "The Clothbound Universe" provides statistics about sales numbers, editions, and prices for many of these texts.

Garsington was a popular meeting place for many modernists and their friends, including D. H. Lawrence, Aldous Huxley, T. S. Eliot, and members of the Bloomsbury group, but it also attracted scientists and popular science writers. According to Henry, through Morrell, “Woolf became part of a network of intellectuals many of whom published multiple non-technical science books on advances in mathematics, the new physics and in cosmology. There she had opportunity to discuss science and mathematics with Cambridge mathematicians Bertrand Russell and Alfred North Whitehead” (14-15). Woolf grew quite close to Russell over the years, referring to him as “Bertie” in her diaries, and his philosophical views may readily be detected throughout her fiction.<sup>43</sup>

In London, Woolf was also surrounded by periodicals that actively circulated news and discussions about discoveries in physics and astronomy. Popular venues included daily newspapers like *The London Illustrated News* and *The Times*, as well as review journals such as *The Review of Reviews*, *The English Review*, and *The London Mercury* (Henry 16). Perhaps the most important periodical for Woolf’s engagement with popular science was the literary weekly *The Athenaeum* (f. 1828), especially under the editorship of John Middleton Murry from 1919 to 1921 (Whitworth, “Virginia Woolf and modernism” 149). The *Athenaeum* had a long tradition of publishing scientific content that continued through the 1920s, and Woolf and others in her social circle such as Clive Bell, Roger Fry, and Lytton and James Strachey frequently contributed pieces that were placed alongside expositions of science and reviews of popular science books. After the *Athenaeum* was subsumed into *The Nation & Athenaeum* in 1923, Leonard Woolf served as literary editor through 1931 and reviewed books by Russell, Haldane, and Jeans. Although Eddington and Jeans did not publish in these journals, their work was

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<sup>43</sup> See Banfield for a thorough study on Woolf’s relationship with Russell.



regularly reviewed and discussed in their pages. The presence of science in printed material, however, should not overshadow the role of general conversation about the meaning and implications of scientific discoveries. Throughout England in the 1920s, Einstein achieved celebrity status as his ideas became vogue, and Britons—including Woolf and her friends and associates—were eager to discuss the cosmology revealed by new developments in physics and astronomy. Finally, Woolf would have also learned about Einstein’s theories and quantum physics through the BBC’s wireless broadcasts. During the 1920s and 30s, up to sixty percent of the BBC’s content dealt with science (Drouin 120-21), and scientists like Eddington and Jeans were commissioned to give talks and lectures on physics and astronomy, many of which were hugely popular.<sup>44</sup>

Evidence for Woolf’s exposure to the new physics, reading of popular science books, and general fascination with the new vistas of space and reality may be found in her diary, letters, and fiction. As Einstein and his ideas surged in popularity during the 1920s, Woolf was one of many Britons eager to discuss their impact on understandings of daily life even though she, along with most of her compatriots, could not fully understand them. She wrote in her diary with pleasure on 20 March 1926 about a dinner party with Clive Bell at which relativity theory was a central topic of conversation: “Otherwise the evening amused me, & I wanted, like a child, to stay & argue. True, the argument was passing my limits—how if Einstein is true, we shall be able to foretell our own lives” (*DIII*: 68). A few years later, Woolf describes a discussion with Bell and Lytton Strachey about “the riddle of the universe (Jeans’ book) whether it will be known; not by us” (*DIII*: 337). While Woolf was eager to discuss physics with others, she also ruminated on space and time in private as she read popular science books. In a letter dated 27

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<sup>44</sup> Beer explores more explicit connections between Woolf and science via the BBC in her essay “‘Wireless’: Popular Physics, Radio and Modernism.”

December 1930, Woolf mentions that she is reading “about the Stars” and trying “to imagine what is meant by space bending back” (*LIV*: 266), likely referring to Jeans’s *The Mysterious Universe*. A couple of years later, shortly after Lytton’s death, Woolf found herself pondering the insignificance of human life in relation to the vastness of space and time. Nearly quoting a passage from Jeans’s *The Universe Around Us* verbatim, she writes, “You know what Jeans says? Civilisation is the thickness of a postage stamp on the top of Cleopatra’s needle; & time to come is the thickness of postage stamps as high as Mont Blanc” (*DIV*: 65). Woolf’s interest in the writing of Jeans, Eddington, and other popular science writers helped spur her and Leonard to purchase a telescope in 1937. She relates, “We have seen Jupiter minus the waiting women: & a plaster cast of the moon” (*DV*: 109).

Although popular expositions of relativity and quantum physics were fashionable topics of discussion and everyone knew that they were revolutionary, Woolf was not ready to admit that they were having an impact on literature. On 28 May 1938, Woolf recalls how “Miss Nielsen came; a daneish bee haunted American lit. prof., entirely distracted by Einstein, & his extra mundane influence upon fiction” (*DV*: 146). Nevertheless, Einstein’s name appears in *Mrs. Dalloway* as Mr. Bentley considers the symbolic value of the airplane (28), and both Eddington and Jeans are mentioned alongside Darwin in *Between the Acts* (20). This list of references to scientists and their writings only outlines their presence in Woolf’s life throughout the 1920s and 30s, but it is enough to demonstrate that the new physics was a strong influence—one among many—on her thinking and the development of her prose. As Gillian Beer notes, “In her novels, and in her letters and diaries she increasingly melds her reading in popular science with all the other sources of her mind, not privileging scientific thought but subjecting it to humour, and making it part of poignant human experience too” (“Wave, Atom, Dinosaur” 19).

### 5.5 A Climate of Uncertainty

The biographical connections between Woolf and prominent figures of the scientific community, her association with print venues that published scientific material, and her references to science in her fiction and non-fiction writing reveal the extent to which she lived and wrote in an environment saturated with science. The prevalence of the new physics in British society in the 1920s and 30s catalyzed an epistemological shift that left scientists, philosophers, authors, and common citizens alike pondering the implications of what these new discoveries might mean for not only the issues of subjectivity (whether scientific, philosophical, or aesthetic), knowledge, and human experience but also the future of the British empire. As Eddington states at the outset of *The Nature of the Physical World*, relativity and quantum theory “are not merely new discoveries as to the content of the world; they involve changes in our mode of thought about the world” (4). In this section, I examine the role of uncertainty in popular expositions of quantum physics by Eddington and Jeans that Woolf either read or would have been familiar with through other means. Deeply interested in the nature of reality, Woolf was drawn to the ways that quantum uncertainty supported her thoughts on the nature of experience—“an incessant shower of innumerable atoms” (9), as she puts it in “Modern Fiction” (1919)—and that “luminous halo” called life (9). After delineating the shift from classical physics to quantum physics using the sources that determined Woolf’s understanding of the issue, I draw connections between uncertainty in physics and the uncertainty that England experienced during the 1930s as World War II loomed on the horizon. Although the discourse of quantum physics has certainly developed since its inception and explanations from figures like Eddington and Jeans have been revealed as inaccurate or, at the very least, requiring nuance, adhering to their writings in an analysis of Woolf and physics is crucial because of the ways that contemporary popular science writers responded to and expressed the new importance of uncertainty. For England, the rise of

uncertainty in science and epistemology coalesced with national anxieties about the impending war to create a climate of uncertainty that would shape Woolf's conception and composition of *The Years* and *Between the Acts*.

Fully understanding the significance of uncertainty in quantum physics entails grasping the power of certainty in Newtonian physics and the confidence it generated in the scientific process. Prior to the development of thermodynamics around the mid-nineteenth century, Victorian scientists adopted a mechanistic view of the universe in which every phenomenon available to observation and experience was the effect of a pre-existing cause and would in turn function as a cause for a predetermined effect. Through the application of Newton's laws, the entire history and future of everything could supposedly be mapped out with certainty. As Jeans describes, "What happened at any instant did not depend on the volitions of extraneous beings, but followed inevitably by inexorable laws from the state of things at the preceding instant. And this state of things had in turn been inevitably determined by an earlier state, and so on indefinitely, so that the whole course of events had been unalterably determined by the state in which the world found itself at the first instant of history" (*Mysterious* 8). Perceiving the universe as a great machine in which all parts function according to absolute laws, Victorian scientists believed that with the proper tools and enough time they could come to know the operations of this machine completely. A great victory for classical physics that cemented scientists' confidence in the universal model that they were constructing was the discovery of Neptune in 1846. When the English astronomer John Couch Adams and French astronomer Urbain Le Verrier noticed abnormalities in the orbit of Uranus, they posited that another body yet unobserved must be orbiting nearby. Through the application of Newtonian physics, Adams and Le Verrier were separately able to calculate when and where this mystery planet would

appear. Jeans notes that this discovery was regarded by many “as the greatest triumph of the human mind, at any rate since the time of Newton” (*Universe* 18). Indeed, if causes in the macroscopic universe could be mathematically formulated and the future of any give part of the universe predicted with such certainty, then, surely, so the narrative went, the microscopic universe must follow suit, all that was needed were the proper tools to observe and experience it.

Eddington points out that the deterministic scheme of classical physics is a “trick”: “it smuggles the unknown future into the present, trusting that we shall not press an inquiry as to whether it has become any more knowable in that way” (*Nature* 308). In other words, determinism in physics involves a certain level of assumption that something not yet observed or experienced will inevitably become knowable. A crucial transition from this idea in classical physics to the uncertainty of quantum physics was the formulation of thermodynamics, specifically the second law dealing with entropy. Thermodynamics shifted physics away from the certainty of classical determinism toward a new probabilistic discourse in which uncertainty was mingled with certainty, eventually paving the way for quantum physics.

To give a brief history, what is now known as the “old” quantum theory was initiated in 1900 when the German physicist Max Planck determined the proper formulas to describe black body radiation. To do so, he abandoned the classical view that energy was emitted in a continuous stream and suggested instead that it was released and absorbed in small packets that he called “quanta.” Planck’s discovery was progressed, on the one hand, by Einstein who sought to delineate its general principles, and, on the other, by Niels Bohr who was more interested in its implications for atomic structure. In the following years, Bohr developed his theory of the atom, taking New Zealand-born British physicist Ernst Rutherford’s solar model and contributing the idea that electrons orbited the nucleus in definite energy levels. At this stage, physics was in an

odd place when it came to the role of determinism and certainty. Even though classical and quantum theories were (and remain) irreconcilable, physicists were still using both sets for different phenomena. In Bohr's model of the atom, for example, the electrons supposedly traveled in their orbits deterministically according to classical theory, but they jumped between orbits non-deterministically according to quantum theory. Quoting his fellow physicist William Bragg, Eddington relates the joke that physicists "use the classical theory on Mondays, Wednesdays and Fridays, and the quantum theory on Tuesdays, Thursdays and Saturdays" (194).

This balancing act between classical and quantum theories became unsustainable by 1925 when Bohr's model of the atom needed to be updated to more accurately account for the orbital motion of electrons. The "new" quantum theory, later known as quantum mechanics, originated in 1925 with the publication of a revolutionary paper by Werner Heisenberg dealing with quantum transition frequencies. Very quickly, Heisenberg's theory went through three successive phases associated with the work of German physicists Max Born and Pascual Jordan, British physicist Paul Dirac, and Austrian physicist Erwin Schrödinger, eventually leading to the formulation in 1927 of Heisenberg's famous Principle of Indeterminacy, alternately, Principle of Uncertainty. While Heisenberg initiated this concept, Bohr was primarily responsible for elucidating its consequences for first physics and then philosophy. On the surface, Heisenberg's uncertainty principle appears quite simple, but the implications of a discovery that revealed such a fundamental characteristic of the building blocks of matter were revolutionary. Basically, the uncertainty principle states that the simultaneous exact measurements of a particle's position and velocity are mutually exclusive; as one measurement becomes more precise, the other measurement becomes less so. What this means, according to Eddington, is that "*a particle may have position or it may have velocity but it cannot in any exact sense have both*" (Nature 220).

Besides its implications for physics, the uncertainty principle also addresses the fundamental limits of human knowledge. For something to move from the unknown to the known domains of reality, it must be connected with human experience in some way. The uncertainty principle shows that attempting to connect a particle with human experience completely upsets the nature of that particle in a way that prevents its actual state from becoming known. Without data stating the particle's position and velocity, determining its past and future states becomes impossible, thus dissolving the supremacy of causal and predictive determinism. Eddington explains, "When we cannot point to any causal effect on anything that comes into our experience, the entity merely becomes part of the unknown—undifferentiated from the vast unknown" (*Nature* 221). Therefore, humans can never absolutely know the state of a particle itself; we can only know the effects of the particle's interaction with something else as detected by specialized measuring instruments. Strictly speaking, what quantum physicists sought is fundamentally unknowable. Eddington and Jeans both emphasize this idea in their initial reactions to quantum mechanics. For the former, "The suggestion is that an association of exact position with exact momentum can never be discovered by us *because there is no such thing in Nature*" (225); for the latter, "to borrow Locke's phrase, 'the real essence of substance' is for ever unknowable" (*Mysterious* 155). Physical science, therefore, until the advent of quantum physics, had been based on the faulty assumption that humanity could authentically experience reality and thereby come to know that reality. The way of thinking that once seemed to promise an absolute knowledge of the universe as astronomers mapped the skies during the nineteenth century with such precision completely broke down at the atomic level.

Since classical determinism in physics was intertwined with the Enlightenment perspective of human knowledge, its overturning with the advent of quantum mechanics bore

important epistemological implications that would have resonated strongly with Woolf as she read Eddington's and Jeans's accounts of the new discoveries. Crucially, before proceeding, quantum mechanics did not disprove classical physics; in fact, classical physics remains incredibly useful in modern physical science. However, fundamental physical science is no longer based on the determinism of classical physics because this concept was revealed by quantum mechanics as unreliable and misleading. Of equal importance, the uncertainty principle represents the limits of the human perspective of the physical world as it exists *within* the physical world. As Eddington puts it, "The principle of indeterminacy is epistemological. It reminds us once again that the world of physics is a world contemplated from within, surveyed by appliances which are part of it and subject to its laws. What the world might be deemed like if probed in some supernatural manner by appliances furnished by itself we do not profess to know" (*Nature* 225). Eddington's comment does not mean that knowledge is impossible. Knowledge of the physical world is possible via an experience of the physical world, but quantum physics demonstrates that through that interaction we fundamentally change the object of study, thus banishing its actual state—that which exists apart from the interference of human experience—to the unknowable. As Eddington describes in a particularly powerful passage,

It is only through a quantum action that the outside world can interact with ourselves and knowledge of it can reach our minds. A quantum action may be the means of revealing to us some fact about Nature, but simultaneously a fresh unknown is implanted in the womb of Time. An addition to knowledge is won at the expense of an addition to ignorance. It is hard to empty the well of Truth with a leaky bucket. (229)



What remains for humanity, then, is a type of knowledge in which what is known and what is unknown are mixed, and this mixture brings physics back to the concept of probability.

As quantum mechanics matured in the late 1920s, the epistemology that emerged perceived reality in terms of waves of probability. Since the certainty of classical determinism was no longer viable at the quantum level, physicists replaced a linear model of knowledge that sought to predict what *would* happen with a wave model of knowledge that sought to predict the probability of what *might* happen. This type of prediction is mixed with uncertainty, so it is represented as an undulating wave that denotes various possible outcomes. The shape of the wave itself is a product of the information available to physicists at the time they make their formulations. Therefore, as the amount of information changes, the wave does too. As Jeans describes,

Heisenberg and Bohr have suggested that these waves must be regarded as a sort of symbolic representation of our knowledge as to the probable state and position of an electron. If so, they change as our subjective knowledge changes, and so become largely subjective. Thus we hardly think of the waves as being located in space and time at all; they are mere visualizations of a mathematical formula of an undulatory, but wholly abstract, nature. (*Mysterious* 147)

The probability wave is especially useful in quantum mechanics because it does not imply any form of exact position and exact velocity for a particle. The wave is unstable, undulating according to the information available, and conveys degrees of uncertainty intermixed with certainty. To better know some aspect of the wave distribution (like an electron's velocity) means to know less of another aspect (like an electron's position). Such a symbolic representation of knowledge has universal implications for the human perception of reality and

the play between what is knowable and unknowable. According to Eddington, “We have had to give up the attempt to define an objective world which corresponds exactly to what is potentially knowable. We have instead a universe which is just half knowable, and we are free to choose which half we shall set about knowing” (*New Pathways* 104). In quantum mechanics, then, the focus is not on predicting a sequence of events in the objective universe, but rather on predicting the degree of probability for certain possible events within a given system.

Through periodical articles, the radio, public lectures, and popular science books, including those quoted above, the epistemology of quantum physics was disseminated throughout England during the late 1920s and 30s. Although even the most educated of non-technical audiences would have struggled with some concepts, if not failed to understand them altogether, the general ideas and implications were clear: quantum physics challenged the supremacy of determinism, revealed that human knowledge is limited by experience, reevaluated knowledge itself as a mixture of the knowable and unknowable, and represented reality in terms of probability waves. Such conclusions called into question longstanding Enlightenment concepts such as empirical certainty, historical determinism, and subjective stability. For many modernists, quantum physics was not necessary to introduce these ideas, for they had already been grappling with them in their writing for decades before. After the popularization of quantum-theoretical ideas, however, uncertainty assumed an elevated importance in the 1930s as other cultural domains were likewise responding to their own manifestations of uncertainty. As Tyrus Miller observes, the later stage of modernism is situated amidst “the early-twentieth-century context of shifting hierarchies within the arts, intensive development of mass media, and traumatic events of social and political history—historical trends that were incipient for high modernist writers, yet not so ineluctably part of the ‘weather’ as they would become during the

1930s” (24). What Miller sees as “weather” I interpret as “climate” because uncertainty discourses were intensifying in a variety of cultural domains. This rise of uncertainty during the 1930s achieved its most powerful, terrifying manifestation in the threat of another world war as Hitler and the other fascist dictators solidified their power. Questions of whether war could be avoided, whether Hitler could be appeased, and whether England could triumph were forefront in the minds of Britons. An analysis of Woolf’s diary during these years reveals her feelings of uncertainty and ruminations on the probable futures that seemed to lay before her, her family and friends, and the nation.

The rise of fascism in Europe in the late 1920s and 30s cast the continent into a time of uncertainty, and Hitler and Mussolini begin appearing more frequently in Woolf’s diary from 1933 onward as the prospect of war begins to take shape in the minds of the English people. Initially, Woolf’s accounts are secondhand. After meeting with the German composer Bruno Walter, who had fled Germany, Woolf alludes to his “madness” and how “he can’t get the ‘poison’ . . . of Hitler out of him” (*DIV* 153). Upon reading about Hitler’s political purges the next year, Woolf relates, “A queer state of society. If there were any idea, any vision behind it: but look at the masks these men wear—the brutal faces of baboons, licking sweet paper. And for the first time I read articles with rage, to find him called a real leader” (224). In 1935, the year after Hitler met Mussolini in Venice, the probability that war would occur became a constant topic of conversation in Woolf’s circle, especially after Hitler broke the Treaty of Versailles by reintroducing military conscription. She wrote on 20 April, “In the public world, there are emphatic scares. L. brings home a bunch after every Cttee meeting. Its odd how seldom I report them. One of these days they may come true. For instance, [Ernst] Toller says we are on the brink of war. Wants the allies to declare war on Hitler” (303). Two days later, during another

conversation about Hitler, Woolf mentions that the German air force already seems able to overcome the Royal Air Force, wondering what will happen “if they do kill us all” (304):

“Anything may happen at any moment. Here in England we havent even bought our gas masks. Nobody takes it seriously. But having seen this mad dog [Hitler], the thin rigid Englishmen are really afraid” (304).

As the likelihood of war increased, much of the uncertainty felt in England dealt with Hitler’s volatile behavior and whether he would honor any previous pacts. When Hitler moved his troops into the demilitarized zone of the Rhineland in violation of the Versailles and Locarno Treaties, Woolf noted that he had “broken his word again” (*DV*: 16), and two days later explained her struggle to make sense of it all: “It all seems in keeping: my drudgery; our unsociability; the crisis; meetings; dark—& what it all means, no one knows” (17). In 1938, Woolf begins to fuse the sights and sounds of war with the weather as the British army mobilizes. On 7 August, she describes, “Yesterday I saw 6 tanks with gun carriages come clambering down the hill & assemble like black beetles at Rat Farm. . . . Harold [Nicolson] is very dismal, Vita says: predicts war, but not this week. . . . A great purple black cloud massed itself behind Mrs W. Sylvia & Edgar as they sat out here; then thunder: then rain, at last” (160). The figurative storm gathering on the horizon does not yet break, but the suspense and anxiety of when it will continue to pervade Woolf’s life. On 17 August, she relates, “So, at supper, we discussed our generation: & the prospects of war. Hitler has his million men now under arms. Is it only summer manoeuvres or—?” (162). Woolf leaves the thought unfinished simply because she does not know how to interpret Hitler’s actions, or, perhaps, does not want to. Two weeks later, as she ponders “what Hitler will do, when he’ll do it” (165), Woolf describes hearing Kingsley Martin, editor of *The New Statesman*, analyze the situation in terms of “3 possibilities”:

“One of them European war. But not at once. A game of bluff on H[itle]r’s part, possibly. Anyhow he doesn’t want a European war now. So may isolate the shindy; & we may rat with the French at the last moment” (165). These possibilities may be conceived as a wave of probabilities in which each the probability of each possible result fluctuates according to pre-war developments and the availability of new information.

On 5 September 1938, as Woolf was working on her biography of Roger Fry, she considers, “What would war mean? Darkness, strain: I suppose conceivably death” (*DV*: 166). Woolf’s thoughts turn to the fate of her nephew, Quentin Bell, who had conscripted. “[N]one of it fits,” Woolf writes. “Encloses no reality. Death & war & darkness representing nothing that any human being . . . cares one straw about” (166). For Woolf, possible futures seem to spread out before her like a wave: “I cant spread my mind wide eno’ to take it in, intelligibly. If it were real, one cd. make something of it. But as it is it merely grumbles, in an articulate way, behind reality” (166). A couple of weeks later, British Prime Minister Neville Chamberlain appeased Hitler in Munich over Germany’s illegal territorial acquisitions, thus presenting England with a false hope of avoiding war that many Britons, including Woolf, doubted. Employing the weather to express her thoughts, Woolf describes that when Chamberlain returned to England, he “must be looking on the bright sunshine this morning with a good deal of relief” (176). Chamberlain’s bright sunshine of relief, however, is shattered with a storm the next day: “A violent storm—purple ink clouds—dissolving like blots of ink in water” (177). This storm assumes a symbolic dimension for Woolf as she considers that “[t]hese dictators & their lust for power—they cant stop. He’ll [Hitler] get stronger & stronger” (177). As her thoughts unfold, Woolf finds that the weather seems to provide the best means of representing the uncertainty of the time and the probabilities of war: “Now grown (we suppose) to a rope—unless this storm is symbolical; its

odd how susceptible the mind becomes to weather symbols—roping everything in—in crises like this is, or was. Of course there’s bound to be a turn against relief—but I’m watching the storm—as in violent illness” (178). Less than one year later, the storm broke as the Nazis invaded Poland and England and its allies declared war.

### 5.6 “It was an uncertain spring”: Probing Uncertainty in *The Years*

Shortly after *The Waves* was published in 1931, Woolf conceived of another novel that she wanted to be more didactic in nature. She wrote on 2 November 1932, “Its to be an Essay-Novel, called the Pargiters—& its to take in everything, sex, education, life &c; & come, with the most powerful & agile leaps, like a chamois across precipices from 1880 to here & now—Thats the notion anyhow, & I have been in such a haze & dream & intoxication, declaiming phrases, seeing scenes . . .” (*DIV*: 129). In the 1930s, as she read about quantum physics and pondered the role of uncertainty as the prospect of another world war became increasingly likely, Woolf’s attention and energy became focused on political activism, especially promoting women’s rights and pacifism while fighting against colonialism and fascism, and she hoped this next novel, which went through a progression of titles before she arrived at *The Years*, would provide a vehicle for her views. For Woolf, the issues facing England converged in the concept of uncertainty, which seemed to express the instability of the times and offer a means of understanding the probable futures that she and her country faced. As Anna Snaith explains, “Faced with a decade inaugurated and characterised by political and economic crisis, she responded by making that uncertainty her subject” (Introduction xxxix). At first, even though she was simultaneously engaged with writing the imaginative biography *Flush* (1933), Woolf made rapid progress on her essay-novel project, writing over 60,000 words before the end of 1932. As the decade unfolded, however, the amount of material became too unwieldy for one book, so she

reformatted the non-fiction portion into what would become *Three Guineas* (1938), leaving the fictional, but still politically-charged, *The Years*.

Split into eleven sections spanning from 1880 to “Present Day,” *The Years* follows the lives of the Pargiter family as they traverse the cultural changes that occurred in England from the end of the Victorian era through the early twentieth century. Snaith points out, however, that even though the “dated chapter sections suggest a straightforward chronology, and related ideas about the progression of history,” this is “immediately undercut by the novel’s numerous repeated phrases and recurring objects, pointing instead to simultaneity or synchronicity” (Introduction xli). Indeed, *The Years* is a novel in which the present is continuously haunted by possible futures, which continue to be rewritten in the minds of the characters as their lives unfold and circumstances change. This conception of time dissolves any notions of historical continuity and certainty about the future, offering instead a model in which each moment fluctuates according to changes in the possibilities to come. Woolf’s challenge to a progressive, deterministic view of history in *The Years* also extends into her views of subjectivity and national identity. By framing each section with a description of the weather, Woolf presents a narrative couched in symbolic uncertainty that depicts history and subjectivity as the products of probability rather than certainty, and she demonstrates that knowledge behaves as an event or act that emerges as this probability manifests itself in the daily lives of human beings.

The 1880 section of *The Years* begins with a powerful note of uncertainty that provides Woolf’s readers with a standard by which they should read the text: “It was an uncertain spring. The weather, perpetually changing, sent clouds of blue and of purple flying over the land” (3). Throughout the country, this uncertainty imposes a measure of suspense on the English as they go about their routines; however, for this time of year, uncertainty is not uncommon: “In the

country farmers, looking at the fields, were apprehensive; in London umbrellas were opened and then shut by people looking up at the sky. But in April such was to be expected” (3). The uncertain spring that marks the outset of *The Years* represents a form of knowledge in which the unexpected becomes a part of the expected, making the appropriate behaviors of Britons a matter of probability. To reinforce this idea, the narrator proceeds to describe the play of light and darkness as the streetlamps go on: “When the sun went down a million little gaslights, shaped like the eyes in peacocks’ feathers, opened in their glass cages, but nevertheless broad stretches of darkness were left on the pavement” (4). In this line, Woolf presents a symbolic image in which the streetlamps ignite like eyes that open and perceive what is accessible to human experience and therefore knowable. Similar to the physicist’s knowledge of a quantum particle, however, this illumination comes at the expense of knowing other aspects of the environment, hence the stretches of darkness that remain to mingle with the light. As the opening section of *The Years* concludes, the novel’s readers are encouraged to interpret the upcoming sections of the narrative, “the days, the weeks, the years,” as ephemeral, shifting clouds that “passed one after the other across the sky” (4).

While the uncertainty of the opening prelude frames the “1880” section, the following content introduces a society ensconced in the deterministic milieu of the Victorian era. Colonel Abel Pargiter sits in a gentlemen’s club relaxing in a leather armchair as he shares stories with his fellow former soldiers about their adventures in the British colonies. As he looks out the window, he observes a society in which each person is apparently defined by a future purpose and direction: “Everybody in the crowded street, it seemed, had some end in view. Everybody was hurrying along to keep some appointment” (5). While he ponders the worsening condition of Rose, his wife whose mortal illness has set her on a fatal path of certainty, Abel also ruminates



an end for himself: “One of these days—that was his euphemism for the time when his wife was dead—he would give up London, he thought, and live in the country” (6). Abel’s tendency for observing and analyzing his surroundings, which he likely honed working overseas for the British empire, leads him to try and diagnose his mistress’s dog after he leaves the club: “The Colonel began in his methodical way to examine the dog’s ears again. Was it eczema? or was it not eczema?” (8). Abel’s way of thinking reflects the Victorian era’s confidence in the power of human knowledge. As the scene shifts to the Pargiter household, readers are introduced to the children of the family, all of whom are likewise awaiting the death of their mother.

Unlike Abel, the Pargiter women, Eleanor, Delia, Milly, and Rose, are free-thinking and progressive, and these characteristics open a world of possible futures for each of them that change over the course of the novel. Eleanor, the eldest, for example, has a passion for helping the poor and dedicates a great deal of her time to doing so. She is also later involved with the women’s suffrage movement, along with her youngest sister, Rose. Delia has political ambitions too, yet she dreams while young about joining Charles Parnell in Ireland to fight for the country’s home rule. As she imagines, “She was on the platform; there was a huge audience; everybody was shouting, waving handkerchiefs, hissing and whistling” (23). These aspirations demonstrate the ways in which the Pargiter women resist the Victorian confines placed on their gender.

Before Eleanor and her sisters may begin pursuing their possible futures according to the probability that each will occur, however, their Victorian mother must die so that their narrative trajectories may be symbolically freed from the determinism that she and Abel represent. While Delia daydreams about the future, Eleanor struggles to voice this thought aloud to her: “‘Look here, Delia,’ said Eleanor, shutting her book, ‘you’ve only got to wait . . .’ She meant but she

could not say it, ‘until Mama dies’” (19). As the rest of the family struggles with the burden of their mother, Woolf plays with the idea that even this symbol of Victorian determinism, which reigned supreme during much of the twentieth century, is as transient as a cloud. As Delia hesitates outside her mother’s door, she notices out the window “flamingo-coloured curls of cloud lying on a pale-blue sky” (21). Once she summons the resolve to enter the room, she looks down on her mother: “She longed for her to die. There she was—soft, decayed but everlasting, lying in the cleft of the pillows, an obstacle, a prevention an impediment to all life” (22). While Mrs. Pargiter’s power seems everlasting to the young Delia, the way she lies in the pillows parallels the way the puffs of cloud lie in the sky. Not long after, Mrs. Pargiter dies, thus opening to her female children the possibilities of the future.

The uncertainty that their mother’s death introduces into the lives of the Pargiter women is reflected in the minds of Londoners as they consider how to respond to the weather: “It was raining. A fine rain, a gentle shower, was peppering the pavements and making them greasy. Was it worth while opening an umbrella, was it necessary to hail a hansom, people coming out from the theatres asked themselves, looking up at the mild, milky sky in which the stars were blunted” (47). This spring did, indeed, prove to be uncertain, as even the stars, those classic guides for sailors and shipping routes, become obscured. Without their mother, who died, as Mrs. Malone, another relative, puts it, “Just when the children most wanted her” (80), Eleanor and her sisters face a future in which their lives may take any number of possible trajectories, none of which is certain but some of which seem more probable than others based on each woman’s present circumstances. On the day of Mrs. Pargiter’s funeral, “an uncertain day” (84), as the narrator describes, Delia observes the procession and listens to the eulogy, watching the emotional displays of her family. Like the deterministic power of the era that she symbolizes,

Mrs. Pargiter has passed away, and, at least in Delia's view, the displays of sadness for this by-gone era appear superficial: "None of us feel anything at all, she thought: we're all pretending" (87). As the 1880 section concludes and the Pargiters begin to depart the service, the weather and the questions it brings provide the punctuation: "The ceremony was over; rain was falling" (88).

With Mrs. Pargiter's death and Abel's failing health, the women of the Pargiter family begin pursuing their personal ambitions in society, often against the strictures of tradition. Indeed, the "1891" section introduces these symbolic winds of change: "The autumn wind blew over England. It twitched the leaves off the trees, and down they fluttered, spotted red and yellow, or sent them floating, flaunting in wide curves before they settled" (89). Eleanor, who acts as Abel's primary caregiver, seizes the opportunities enabled by these changes to become more involved with her philanthropic projects, even challenging the men in her group. After being asked her opinion at one meeting, "She pulled herself together and gave him her opinion. She had an opinion—a very definite opinion. She cleared her throat and began" (96). Nevertheless, Eleanor maintains a level of consistency with the tendency among nineteenth-century upper-class women to devoted themselves to caring for an aging parent. Her appearance and demeanor in public even seem to betray her adherence to some traditional social responsibilities. While riding an omnibus, a stranger offers this appraisal of Eleanor: "a well-known type; with a bag; philanthropic; well nourished; a spinster; a virgin; like all the women of her class, cold; her passions had never been touched; yet not unattractive" (102). Eleanor's maturation as a somewhat liberated, though still traditional, woman is paired in the "1891" section with Parnell's death, which, as with Mrs. Pargiter's death, is compared to the fluctuations of the weather. After hearing the news, Eleanor "looked up and saw the sky again; clouds were passing," before pondering that it "was like something fading in the sky" (113). Once again,

Woolf employs the shifting skies to symbolize the uncertainty that accompanies the dissolution of authority embodied in a particular character. As with their mother's death, Parnell's changes present circumstances and thereby causes the probability of the Pargiters' possible futures to change too.

The following three sections of *The Years*, "1907," "1908," and "1910," continue to use invocations of the weather to present an epistemological concept that is later explored in their content. "1907" begins in midsummer with an account of the way that light and human observation determine the nature of that which is seen: "The moon, falling on water, made it white, inscrutable, whether deep or shallow. But where the moonlight fell on solid objects it gave them a burnish and a silver plating, so that even the leaves in the country roads seemed varnished" (129). As the moonlight shines on the water and solid objects, it lends them certain characteristics that define the narrator's experience of those things, similar to what happens when a quantum physicist measures a particle's position or velocity. Knowledge is therefore not a thing; rather, it is an event that occurs when a variety of factors beyond human comprehension converge at a given moment and are processed according to the information available at that time. This idea is expressed through Sara, one of Eleanor's cousins. Sara contemplates one evening the nature of thought, likely after reading philosopher George Berkeley's *Three Dialogues* (1713) (Snaith, Explanatory 453): "'And he says,' she murmured, 'the world is nothing but . . . ' She paused. What did he say? 'Nothing but thought, was it?'" (132). Instead of trying to objectify the world as thought, "she would let herself *be* thought. It was easier to act things than to think them" (133). If human knowledge is an event, Sara wonders as she tries to become thought, then "[w]here did thought begin?" (133). Sara's questioning of origins hits

upon a fundamental aspect of quantum physics, which rejects the idea altogether as part of its dissolution of causality and determinism.

While “1907” examines the “eventness” of knowledge and the validity of origins, “1908” plays with the concept of complementarity, which, in quantum physics, refers to ability of a particle to possess two sets of contradictory properties simultaneously. The weather prelude to this section once again introduces the idea: “It was March and the wind was blowing. But it was ‘not’ blowing” (146). As the lives of the Pargiters unfold, Eleanor begins to perceive that something cannot be reduced to one set of characteristics, which is often the reductive product of a certain point of view. One day, she ponders her deceased Uncle Digby and Aunt Eugénie: “he had been a curious man; weak; sensitive; liking titles, liking pictures; and often depressed, she guessed, by his wife’s exuberance. . . . It was odd how different the same person seemed to two different people” (154). The idea that one person can possess two sets of opposing properties appears again in the “1910” section as Eleanor’s youngest sister, Rose, now an active member of the feminist movement, considers that she feels like “two different people at the same time; that she was living at two different times at the same moment” (167). Later, Rose’s cousin Maggie thinks that Rose looks “more like a man than a woman” (170). This recurring idea that someone can be more than one person and exist in one moment at different times recalls Woolf’s earlier novel *Orlando* (1928), whose protagonist embodies and expresses the complementarity of gender. Underscoring the connection between their thoughts and physics, Eleanor transitions directly into a consideration of matter: “But what vast gaps there were, what blank spaces, she thought, leaning back in her chair, in her knowledge! How little she knew about anything. Take this cup for instance; she held it out in front of her. What was it made of? Atoms? And what were atoms, and how did they stick together?” (155). Eleanor is thinking about contemporary

advancements in models of the atom, specifically Ernst Rutherford's model from 1911 that revealed the atom to be mostly empty space. Like the wind at the opening of the "1907" section or Rose's thought that she is two people at once, the matter composing Eleanor's cup is both solid and empty. Although it may seem stable from the perspective of human experience, closer examination exposes its utter instability, an idea that undoubtedly resonated with Woolf's conceptions of gender, subjectivity, and history.

The following three sections, "1911," "1913," and "1914," continue to trace the subjective trajectories of the Pargiter family as they emerge from the cultural changes of the era. Abel dies in 1911, thus freeing Eleanor from her final attachment, and she increasingly spends her time traveling the world and continuing her philanthropic endeavors. In "1911," as the "sun was rising" and "sky was so vast, so cloudless" (192), Eleanor reflects on her travels and the relative nature of experience: "She felt as if things were moving past her as she lay stretched on the bed under the single sheet. But it's not the landscape any longer, she thought; it's people's lives, their changing lives" (211). Rather than defining her life in terms of cultural determinism, Eleanor understands experience as the product of changing relations among people, places, and things. For her, the future that once seemed to be a set landscape now appears to fluctuate as she accumulates experiences in the present. Meanwhile, Rose has become a more militant member of the women's suffrage movement, even spending time in jail for throwing a brick through a window. In "1913," Eleanor tries to sell the family house, which remains filled with relics from their Victorian past. When Martin, one of Eleanor's brothers, finds letters from his father's mistress, his once-certain view of his father—and his entire family, for that matter—is shattered: "there all those people had lived, boxed up together, telling lies" (223). For Martin, this dramatic change in the information available to the present fundamentally alters his outlook on life.

The notes of probability and uncertainty that permeate the earlier sections of *The Years* become more pronounced during the “1917” section as a group of characters endures a German air raid. Likely due to her own experiences during World War I, Woolf approached the raid scene differently than the rest of the novel. She wrote on 16 October 1935, “The question is can I get at quite different layers by bringing in music & painting together with certain groupings of human beings. This is what I want to try for in the raid scene: to keep going & and influencing each other: the picture; the music, & the other direction—the action—I mean telling a character—while the movement (that is the change of feeling as the raid goes on) continues” (*DIV*: 347). Aiming to construct a moment in which a variety of influences converge to affect the overall atmosphere, Woolf wove uncertainty into the fabric of the air raid scene and employed an undulating spiderweb to symbolize the shifting probabilities of the possible outcomes as the attack unfolds.

On a “very cold winter’s night, so silent that the air seemed frozen” (279), Eleanor arrives at her cousin Maggie’s residence for dinner to find her, her spouse Renny, and their Polish friend Nicholas discussing “the psychology of great men” in “the light of modern science” (281). Their conversation is quickly interrupted, however, when the alarm sounds to signal the start of the raid, thus initiating a stretch of time in which probability becomes a matter of life and death. As they huddle around a table in the basement, Eleanor tries to assure the others that the “chances of being hit oneself are so small” (289). Nevertheless, the sounds of war quickly draw nearer, and the group finds themselves directly under the planes: “The silence was profound. Nothing happened. Eleanor looked at the blocks of stone over their heads. She noticed a spider’s web in one corner. Another gun boomed. A sigh of air rushed up with it. It was right on top of them this time” (290). While not unnatural, the placement of a spiderweb in this scene is highly

significant. In my earlier discussion about quantum physics, I described how it relies on waves of probability to determine the possible states of a particle; as the amount of information available in the present changes, the wave adapts accordingly to better represent possible futures. During the raid scene of *The Years*, the characters must live through one of these figurative waves of probability as it fluctuates according to shifts in the numerous factors affecting the chances that they will be hit. The spiderweb symbolizes this dynamic, and it changes shape throughout the scene as the action unfolds. As they wait in suspense, Eleanor thinks, “The Germans must be overhead now. She felt a curious heaviness on top of her head. One, two, three, four, she counted, looking up at the greenish-grey stone. Then there was a violent crack of sound, like the split of lightning in the sky. The spider’s web oscillated” (291). Synthesizing war, weather, and probability, these lines associate movements in the spiderweb with the introduction of new factors. As the characters hear the thunder-like explosions and the planes flying overhead, Eleanor counts to mark the shifting present as the symbolic web of probabilities oscillates. The scene continues—“At any moment a bomb might fall” (291), the narrator relates—and still the web adapts: “One, two, three, four, Eleanor counted. The spider’s web was swaying. The stone may fall, she thought, fixing a certain stone with her eyes. Then a gun boomed. It was fainter—further away” (291). Although they manage to avoid being hit, they can still hear the destruction of the guns in the distance: “There was a sound like the breaking of waves on a shore far away” (293). While Eleanor and the others were fortunate enough to reside in a portion of the symbolic probability wave that did not eventually represent death, other Britons were not. As Renny bitterly comments, “They’re only killing other people” (293).

As *The Years* enters its final section, “Present Day,” which likely occurs somewhere in the early 1930s, the wave-like imagery of the prelude bridges the upcoming events with the



uncertainty of the raid scene: “It was a summer evening; the sun was setting; the sky was blue still, but tinged with gold, as if a *thin veil of gauze* hung over it, and here and there in the gold-blue *amplitude* an *island of cloud* lay suspended” (my emphasis; 306). The narrator then describes the trees in the fields as “caparisoned,” the dust as a “fume,” and even the brick villas as “porous” (306). This gossamer scene sets the stage for the climactic dance in the novel as all the characters gather together from their various life trajectories. Although they all scattered after the symbolic passing of their mother to pursue their possible futures, this moment brings the Pargiters back together under the growing threat of World War II, which continues to change the probability of what might happen in the coming years. After noting a “blurred picture of a fat man gesticulating” in the evening paper (330), likely Mussolini, Eleanor speculates to her niece that “it means the end of everything we cared for” (332). The dance, which takes place at Eleanor’s cousin Kitty’s manor, occurs amidst this uncertainty, lending the scene a more serious tone.

After the characters arrive and the tables, chairs, and rugs are put away, the dance begins, and, as it progresses, it analogizes the movements of the participants with atomic physics to present a probabilistic view about the nature of life, subjectivity, and history in which uncertainty mixes with what can be known. As Eleanor sits with her cousin Sara, “People were passing them all the time; they were brushing against their knees; they were beginning to dance. It made one feel a little dizzy” (366). No matter how coordinated, a dance, especially one with so many participants, involves a dimension of probability that is affected by the movements of other people. Each dancer must respond to not only the movements of his or her partner but also the movement of the other couples, each of which is likewise engaged in responding to each other. To determine the likelihood that a particular move or step will be possible and the direction and

extent to which it can be executed, the dancers must constantly interpret a confluence of factors that are constantly changing. The dancers' behavior thus mirrors that of particles, and Eleanor seems to have precisely this idea in mind. As she observes the spectacle and ponders the nature of life, she considers, "Atoms danced apart and massed themselves. But how did they compose what people called life?" (366-67). Eleanor's allusion to physics is no accident. While Woolf was writing *The Years*, she was also reading James Jeans, and she may very well have been thinking about this passage from *The Universe Around Us* when she conceived the dancing scene: "A powerful microscope shews that these super-molecules are not brought completely to rest, but retain a certain liveliness of movement, as they are continually hit about by the smaller and quite invisible true molecules. It looks for all the world as though they were affected by a chronic St. Vitus' dance, which shews no sign of diminishing as time goes on" (150). Named after the patron saint of dancers, a St. Vitus dance refers to a form of chorea in which the face and body are subject to involuntary, uncoordinated jerking movements. By having Eleanor compare the dancers to atoms as she deliberates the concept of a life, Woolf is accumulating the themes of uncertainty and probability established thus far in *The Years* into one literalized metaphor. If, as quantum physics reveals, particles move according to waves of probability and these particles constitute atoms that in turn constitute matter, then at the heart of human existence and modern subjectivity lies uncertainty. Any given life, thought, or experience that emerges from the dance of atoms cannot be causal or deterministic; instead, it must be defined according to the play of probability that takes the symbolic form of a wave. As the dance continues, Eleanor contemplates her life and the form it has assumed while pondering this idea, "Does everything then come over again a little differently? she thought. If so, is there a pattern; a theme, recurring, like music; half remembered, half foreseen? . . . a gigantic pattern,

momentarily perceptible?” (396). Finding herself at this point of reflection, Eleanor seems aware that while her life has emerged at a certain place in this pattern, it could have just as easily emerged at another. Although many possibilities were open to her at the beginning of the novel, some more probable than others, she has arrived at the dance because the flux of factors influencing the present have collapsed at this moment, a moment at which, like all other moments, the present continues to be haunted by possible futures. Eleanor seems at peace with this idea, however, and the sky, which throughout *The Years* serves as a constant reminder of the presence of uncertainty in human life, becomes a source of tranquility for her. At the end of the novel, Eleanor is returning home and pauses on her threshold before wondering, “And now?” (435). With this note of uncertainty, “The sun had risen, and the sky above the houses wore an air of extraordinary beauty, simplicity and peace” (435).

### 5.7 Between the Acts of *Between the Acts*

Each of the Pargiter’s lives as they unfold in *The Years* enacts one possible outcome that became available after the death of their mother, whose passing symbolically freed these figurative atoms to explore paths of probability rather than certainty. Through this novel, Woolf undermines a causal and deterministic view of history, suggesting instead that human life and experience belong to a much larger pattern in which relationships among people, places, and events are the products of uncertainty. If things *are*, then they must *be* a certain way, but this state of being is never the result of linearity or progress. For Woolf, although phenomena occur—a thought, a meeting, a dinner, a raid, a dance—they emerge from a sea of probability and could have just as easily occurred differently. She attends to this notion in *The Years* by depicting only things that *are* during each section. The space between these sections, which would presumably describe how those things came to *be*, is omitted. As I addressed during my reading, between the sections

of *The Years* is a sea of probability. Perhaps ruminating on this betweenness after its publication, Woolf titles her final novel *Between the Acts*, a remarkable decision for several reasons. If she teases readers with only the “acts” of life in *The Years*, then she provides in *Between the Acts* a perspective of what might exist between them. Additionally, the novel takes place between the “acts” of the two world wars and employs metanarrative techniques to implicate the audience of both the novel itself and the play depicted therein in the events that they are witnessing. In exploring how the acts of subjectivity, life, and history emerge from a sea of probability, Woolf suggests a model of thought that centralizes uncertainty as a new organizing principle for knowledge and experience to better account for the dramatic scientific and cultural changes of the era.

In *Between the Acts*, Woolf depicts a modern world filled with technology and resources that enable more immediate satisfaction to human needs and wants than ever before. Isa needs to order fish for luncheon, so she picks up a telephone to have it delivered. Miss La Trobe needs a soundtrack for her play, so she places a gramophone in the bushes. Cars, trains, and airplanes are mentioned throughout the novel, efficiently transporting people and goods to their destinations. The more immediate satisfaction that technology provides also encompasses the communication of information. Lucy Swithin frequently retreats into her copy of H. G. Wells’s *Outline of History* to ruminate on the history of the European continent, including its flora, fauna, and geology. In addition to history, the latest scientific developments are also accessible through popular science books. As Isa peruses their library for a book to read, she wonders if she does not want to read “a life at all, but science—Eddington, Darwin, or Jeans” (20). Moreover, as the Swithins discuss their lives together, Isa’s use of the phrase “touch wood” incites a conversation about its origins, leading her father Bart to ponder for a moment, then conclude, “Lemprière

would settle it; or the Encyclopedia” (25). These allusions to classical scholar and lexicographer John Lemprière’s *Bibliotheca Classica or Classical Dictionary* (1788), which was by then widely circulated, and the *Encyclopædia Britannica*, which had recently adopted a continuous revision policy so that the information could be constantly updated, reveal the extent to which the country is headed toward a modern age of information. Even the weather has now become a part of daily knowledge. Harkening back to one of the first weather anomalies that sparked a national interest in forecasting the weather, Bart likes to tell “the famous story of the great eighteenth-century winter” (8). By now, weather forecasts are a regular occurrence. As the Swithins discuss the weather, “they all looked at the sky to see whether the sky obeyed the meteorologist” (22). Later, Isa looks at “the garden, variable as the forecast said” (29). In the world of *Between the Acts*, information is widely accessible through a variety of modern means and has been incorporated into the daily lives of human beings.

The amount of information and the technologies that enable its access are tethered to a classical way of thinking prevalent throughout *Between the Acts* that seeks to organize history into a continuous linear narrative. As Lucy reads *The Outline of History*, she notes how long ago “the entire continent ... was all one” (8), and lists a number of prehistoric creatures, “from whom presumably ... we descend” (9). Lucy ponders the continuous continent and evolutionary process as she “continue[s] her imaginative reconstruction of the past” (9). When Lucy tells Isa about what she’s read, Isa comments that that was when they “were savages” (30), thereby reinforcing the traditional “savage-to-civilization” chronology. While Lucy and Isa are busy organizing history into a linear narrative, the entire Swithin family is concerned with organizing their familial past into a coherent lineage of both body and mind. When Lucy gives Mr. Dodge a tour of the house, she shows him the portraits of their ancestors. One, however, she notes is “[n]ot an

ancestress,” but, nevertheless, they “claim her” because they have “known her” (68). Even though the Swithins cannot identify the woman in the portrait, she is still forced into their family lineage. Regarding their mental ancestors, Lucy points to their books and claims, “Here are the poets from whom we descend by way of the mind” (68). A continuous heritage of body and mind seems to be a comfort for the Swithins. In fact, as Isa grapples with her ambivalence toward her spouse, she finds solace in thinking of him as the “father of my children”: “It worked, that old cliché; she felt pride; and affection; then pride again in herself; whom he had chosen” (48). For the Swithin family, the past defines the present and the present in turn determines the future. Bart is indeed defined by his colonial past, and, as Isa considers, “Many old men had only their India—old men in clubs, old men in rooms off Jermyn Street” (18). Many of these ideas dealing with geographic history, family lineage, colonialism, and national identity are then reenacted in Miss La Trobe’s play, which attempts to place one piece of history after another.

Despite the prevalence of information and linearity, the weather still resists a deterministic scheme of knowledge. Although a breeze might blow “foretold by the weather expert” (17), the weather remains beyond the certainty of human knowledge. As Bart looks up at the sky, “There was a fecklessness, a lack of symmetry and order in the clouds, as they thinned and thickened. Was it their own law, or no law, they obeyed?” (23). Bart’s concern with law reflects his and his family’s classical way of thinking. If knowledge, history, family, and other aspects of life can be formulated into inexorable laws, then why cannot the weather be also? Yet, in opening the possibility that the weather may obey no law, Bart indicates an awareness of the prevailing presence of uncertainty. As the time for the play to begin draws near, whether the weather will allow an outdoor event or force them indoors remains a constant point of conversation. Despite their best efforts, the play organizers can never seem to predict correctly

because the weather defies their information gathering schemes. Lucy recalls of last year, “D’you remember what a rush we had—when the rain came—getting in the chairs?” (34). Apparently, last year they predicted clear skies, but the rain came anyway. For this year’s event, they hope the opposite will be true: “As for the weather, it was turning out, against all expectation, a very fine day. A perfect summer afternoon” (76). Nevertheless, partway through the play, it pours. Within a world of knowledge, continuity, and certainty, the weather thus remains a powerful symbol of uncertainty, behaving according to a field of probability beyond the grasp of modern technology and information-gathering techniques.

My discussion of *Between the Acts* has so far identified two ways of thinking in the novel: a deterministic one, represented by information technologies and the characters’ concerns with linearity, and a probabilistic one, represented by the unpredictability of the weather. Challenging the validity of the former, Woolf plants uncertainty within the coming-to-know process to demonstrate that the things that *are*, which, on the surface, appear to be the result of linearity, are themselves irreducibly probabilistic. For her, between the acts of life and thought resides uncertainty, and she plays with this idea multiple times in *Between the Acts* to provide a lens through which to view the significance of the main play. For example, one instance occurs when the Swithins are discussing the phrase “touch wood.” As the conversation unfolds, it jumps from topic to topic: the phrase connects to the encyclopedia, which connects to Isa thinking about the fish, which connects to her thinking about the ocean, which connects to Lucy thinking about waves, which connects to them all thinking about creatures from the sea, which connects to Lucy mentioning the contiguous continent, which connects to Isa’s thinking about savages, which connects to her thinking about her dentist, which connects to her thinking about Pharaohs. After this goes on for a while, Lucy finally stops and wonders aloud, ““How did we begin this

talk?’ She counted on her fingers. ‘The Pharaohs. Dentists. Fish ... Oh yes, you were saying, Isa, you’d ordered fish; and you were afraid it wouldn’t be fresh. And I said, “That’s the problem. ...”’ (31). Lucy here retroactively reviews the acts of their conversation. In doing so, she makes a linear connection from one thing to the next leading back to the supposed origin of the conversation when Isa mentions the fish. Although this chain may seem to represent the process of thought, according to Woolf, thought is not subject to inexorable laws of causality and continuity; rather, thought emerges from unexpected mental connections that occur according to the probability that one thing among the many things in any given mind will relate to the next.

To further reinforce this point, Woolf provides this scene of Lucy’s musings:

Mrs. Sands fetched the bread; Mrs. Swithin fetched ham. One cut the bread; the other the ham. It was soothing, it was consolidating, this handiwork together. The cook’s hands cut, cut, cut. Whereas Lucy, holding the loaf, held the knife up. Why’s stale bread, she mused, easier to cut than fresh? And so skipped, sidelong, from yeast to alcohol; so to fermentation; so to inebriation; so to Bacchus; and lay under purple lamps in a vineyard in Italy, as she had done, often; while Sands heard the clock tick; saw the fly; noted a fly buzz; and registered, as her lips showed, a grudge she mustn’t speak against people making work in the kitchen while they had a high old time hanging paper roses in the Barn. (34)

As a member of this rapidly modernizing age of information and an adherent to the classical way of thinking, Lucy enacts a thought process that emphasizes the acts of thought over that which lies between. The ham and bread described at the opening of the passage behave as a metaphor for what Lucy is about to do. Holding an uncut ham or an uncut loaf of bread, Lucy and Mrs. Sands “cut, cut, cut” their continuous objects into pieces. The way the ham, and likely soon the



bread too, is cut is what Lucy does to her thought process afterward. Like the conversation about the phrase “touch wood,” Lucy’s thought jumps from thing to thing, thus representing a partitioning of thought like the partitioning of the ham and bread. At first glance, the relationships between the acts of thought seem completely logical. Yeast does indeed relate to alcohol, which does relate to fermentation, and so on. However, yeast could just as easily relate to bread, as well as any number of other things, and, if this connection or any of the other possibilities were made instead, the entire chain of thought would be completely altered. Such altering could occur at any point, launching the trajectory of thought into a completely different direction. For Woolf, what lies between the acts of thought is what determines the nature of thought itself. A retroactive overview may suggest a linear, causal process, but mirroring the (il)logic of quantum physics, Woolf perceives this conclusion as an illusion. As she demonstrates in the passages that I have examined, between the “acts,” “cuts,” or “years” of thought is a sea of probability. Therefore, conceptions of subjectivity and history that emerge from thought are the result of uncertain relations being established among all possible things within this domain.

Miss La Trobe’s play analogizes the idea that acts of life and human experience are the products of probability. Indeed, nothing in the play is certain, and each act unfolds uniquely as Miss La Trobe tries to react to the plethora of factors at work, each of which contributes a degree of uncertainty to the proceedings. First, she must decide whether to hold the play indoors or outdoors. “Wet would it be, or fine?” She ponders (62). Choosing outdoors simply because the sun happens to appear at that moment, Miss La Trobe then faces an onslaught of unpredictable children and opinionated parents: “The mothers disputed. One child had been chosen, another not. Fair hair was unjustly preferred to dark. Mrs. Ebury had forbidden Fanny to act because of the nettle-rash” (64). The chaos continues as numerous issues have to be decided: “The boys

wanted big parts; the girls wanted the fine clothes. Expenses had to be kept down. Ten pounds was the limit. Thus conventions were outraged” (64). In passages like these, Woolf narratively performs the sea of probability that exists between the acts of life, or, in this case, the acts of a play. Whatever happens to emerge from the pre-play commotion could just have easily been something else if any one of the possible factors were changed. Even as the play begins, providing short skits from English history, uncertainty continues to shape what occurs. The gramophone in the bushes malfunctions, the girl reciting the opening prologue forgets her lines, and the “village idiot” appears onstage acting according to a logic all his own. Completely confused at first, the audience only gradually perceives that the play is supposed to be depicting English history.

As each act of the play develops from a similar sea of probability, Woolf underscores that she is parodying a continuous, linear model of history that would perceive each moment as being born from the last according to inexorable laws. Indeed, the play experiences so many interruptions—“the torture of these interruptions!” cries Miss La Trobe (79)—due to actors forgetting their lines, children behaving erratically, and technical difficulties with the gramophone that most members of the audiences struggle to discern even the slightest notion of what they are watching. As Isa thinks, “There was such a medley of things going on, what with the beldame’s deafness, the bawling of the youths, and the confusion of the plot that she could make nothing of it” (90). Nevertheless, in an act indicative of the modernizing age of information in which they live, the characters repeatedly examine the program for reassurance that they are, in fact, watching a coherent plot. Similar to the dancing scene in *The Years* during which the dancers are compared to atoms moving in relation to each other, the actors onstage in *Between the Acts* also dance, but the scenes, if they can even be so called, that they produce

emerge from an environment far more akin to pandemonium: “The gramophone blared. Dukes, priests, shepherds, pilgrims and serving men took hands and danced. The idiot scampered in and out. Hands joined, heads knocking, they danced round the majestic figure of the Elizabethan age personified by Mrs. Clark, licensed to sell tobacco, on her soap box” (93). Their dancing is not a coordinated dance, but rather behaves as a St. Vitus dance, the metaphor James Jeans used in *The Universe Around Us* to characterize the movements of atoms: “It was a mellay; a medley; an entrancing spectacle (to William) of dappled light and shade on half clothed, fantastically coloured, leaping, jerking, swinging arms and legs” (93). Throughout the play, whatever it may be trying to depict, the only thing holding the events, actors, and audience together is time: “Tick, tick, tick, the machine continued. Time was passing. The audience was wondering, dispersing. Only the tick, tick of the gramophone held them together” (154). By depicting a play that continuously emerges from its own probability yet remains held together by time, Woolf is suggesting that although history is discontinuous and indeterminate, it is still subject to the passage of time, for while the future is uncertain, its arrival is not.

Woolf’s concern with the passage of time in relation to notions of probability and uncertainty relates to *Between the Acts*’s broader cultural message for a country facing World War II. For her, the world wars are also “acts” that England, and the world for that matter, currently resides between. Woolf was, of course, a well-known pacifist, and she presents a biting critique of war and the hyper-aggressive masculinity that causes it in *Three Guineas*, which was published between *The Years* and *Between the Acts*. As with the acts of the play, Woolf sees the acts of war as the products of probability that lack any deterministic meaning. Although war may seem inevitable, it is only one possible outcome of many. However, as the situation in Europe worsened in the late 1930s, the question began to shift from whether war would occur to what

the inevitable war would entail. *Between the Acts* is permeated with these questions as Woolf toys with the idea that another world war may mean the end of history as they know it. When Giles arrives prior to the start of the play, he recalls reading in the paper “that sixteen men had been shot, others prisoned, just over there, across the gulf” (46). For England during this time, the present is haunted by all possible futures. As Isa puts it, “The future disturbing our present” (82). The threat of a war-filled future casts doubt on even the ability of time to remain stable: “How long would time hold them together?” wonders Miss La Trobe (151). Possible futures even seem to speak as the play unfolds: “Over the tops of the bushes came stray voices, voices without bodies, symbolical voices they seemed to her, half hearing, seeing nothing, but still, over the bushes, feeling invisible threads connecting the bodiless voices” (151). Someone then comments that it “all looks very black” and “[n]o one wants it—save those damned Germans” (151). As each moment passes, the characters feel like many Britons must have felt in the late 1930s: “They were all caught and caged; prisoners; watching a spectacle. Nothing happened. The tick of the machine was maddening” (176).

Each tick of the clock brings the storm of war closer to home for both England and the Swithin household. During a scene that symbolizes and prefigures the outbreak of World War II, Giles notes while reading over the program that the play is now in “Present Time. Ourselves” (177). With a dark hint of irony, Giles says, “Let’s hope to God that’s the end” (177). In this “present moment,” the play pauses and the audience is left waiting in suspense: “All their nerves were on edge. They sat exposed. The machine ticked. There was no music. The horns of cars on the high road were heard. And the swish of trees. They were neither one thing nor the other; neither Victorians nor themselves. They were suspended, without being, in limbo. Tick, tick, tick went the machine” (178). As they wait in limbo to see what dramatic fate awaits the present day,

the weather suddenly breaks: “And then the shower fell, sudden, profuse. No one had seen the cloud coming. There it was, black, swollen, on top of them. Down it poured like all the people in the world weeping. Tears. Tears. Tears” (180). In this moment, the weather symbolizes both the uncertainty of the future and all the possible suffering that will result from another world war. As Bart ruminated on the sky earlier commenting that it perhaps obeyed “no law” (12), so also does war obey no law. After whispering, “O that our human pain could here have ending!” (180), Isa raises her eyes to the sky: “Looking up she received two great blots of rain full in her face. They trickled down her cheeks as if they were her own tears. But they were all people’s tears, weeping for all people” (180).

The sky’s weeping lasts only a short while before Miss La Trobe’s play can conclude. The final moments of the last act serve to implicate the audience in the parody of the linear model of history they have just witnessed. The events that were performed on stage emerged from a sea of probability, and now this sea spills out into the world: “Suddenly the tune stopped. The tune changed. A waltz, was it? Something half known, half not. The swallows danced it. Round and round, in and out they skimmed. Real swallows. Retreating and advancing” (182). The uncertainty of that which is half known, half not acquires another symbolic dimension in the form of the swallows and their flight pattern. In fact, the swallows are mentioned earlier in *Between the Acts* when the characters are between the acts of the play, but they are busy building their nests in the barn (100-01). Now, however, they take flight around the stage. When flying in large groups, a flock of swallows takes the shape of an undulating cloud that moves and fluctuates as the birds respond to each other and their environment. These swallows are thus yet another avatar for probability and uncertainty situated alongside those that I have addressed in this analysis: weather, waves, spiderwebs, dancing, and the dramatic parody of history in

*Between the Acts*. When the cast of the play appears onstage holding mirrors, the audience realizes that they too belong to the history that is being depicted. However, as they gaze at themselves in the sea of reflective objects, they are not complete, stable, and continuous subjects; instead, they are fragmented, discontinuous, and simply a collection of material “acts” of being between which lies uncertainty: “Out they leapt, jerked, skipped. Flashing, dazzling, dancing, jumping. Now old Bart . . . he was caught. Now Manresa. Here a nose . . . There a skirt . . . Then trousers only . . . Now perhaps a face. . . . Ourselves? But that’s cruel. To snap us as we are, before we’ve had time to assume . . . And only, too, in parts. . . . That’s what’s so distorting and upsetting and utterly unfair” (original ellipses; 184). Clearly unsettled by seeing themselves in pieces, “as we are, here and now” (186), someone comments, they attempt to escape the truth-revealing reflections of the mirrors: “All shifted, preened, minced; hands were raised, legs shifted. Even Bart, even Lucy, turned away. All evaded or shaded themselves” (186).

After the excitement surrounding the mirrors dies down and the epilogue is recited, a priest appears onstage to offer an interpretation of the play. In this scene, Woolf provides an example of the ways in which a retroactive viewing of the past projects onto it the illusion of a linear historical narrative. After sitting through several acts of rambunctious children, technical malfunctions, rain, and sudden changes in schedule, among other manifestations of uncertainty, the audience desires a master narrative to assuage their distress after having been confronted with a discontinuous retelling of the past and a fragmented version of themselves. As the audience “folded their hands in the traditional manner as if they were seated in church” (191), the priest says, ““I have been asking myself”—the words were repeated—‘what meaning, or message, this pageant was meant to convey?’” As the priest struggles to comfort the audience by explaining what it all means, nature interjects its own meaning, revealing probability once again as that

which defines the acts of life and history: “‘I thought I perceived that nature takes her part. Dare we, I asked myself, limit life to ourselves? May we not hold that there is a spirit that inspires, pervades . . .’ (The swallows were sweeping round him. They seemed cognizant of his meaning. Then they swept out of sight) (192). Intruding upon the priest’s act of speech, which itself is supposed to string together the disjointed scenes of the play, the swallows symbolize uncertainty as the “spirit that inspires, pervades.” As if to reinforce the presence of uncertainty in human life, specifically the lives of the English at this time, the priest’s attempt to continue is interrupted yet again: “The word was cut in two. A zoom severed it. Twelve aeroplanes in perfect formation like a flight of wild duck came overhead” (193). Here, uncertainty cuts into the priest’s final word, severing it in two and reminding the audience of the looming war. As an unidentified member later states, “And what’s the channel, come to think of it, if they mean to invade us? The aeroplanes, I didn’t like to say it, made one think” (199).

The audience is indeed left with their thoughts as the play finally concludes and they part ways with the last act to reenter the betweenness of life. “*Dispersed are we; who have come together*” (196), the gramophone drones on, calling to mind the dispersion of the Pargiters in *The Years* after the death of their mother. As the audience disperses, a cacophony of voices arises attempting to decipher the play’s meaning: “And if we’re left asking questions, isn’t it a failure, as a play? I must say I like to feel sure if I go to the theatre, that I’ve grasped the meaning . . . Or was that, perhaps, what she meant?” (200). Certainty offers assurance, and, when the characters are not immediately offered it, they strive to reconstruct the past so that it fits into their world of continuity and determinism. For Miss La Trobe, the play is simply a cloud, a “cloud that melted into the other clouds on the horizon” (209). As she laments the outcome, brooding over all the possible things that could have been “[i]f they had understood her meaning; if they had known

their parts; if the pearls had been real and the funds illimitable” (209), she passes a tree and suddenly the probability and “ifs” of life erupt: “The tree became a rhapsody, a quivering cacophony, a whizz and vibrant rapture, branches, leaves, birds syllabbling discordantly life, life, life, without measure, without stop devouring the tree. Then up! Then off” (209). Although the tree, like life, appeared to be a stable, arboresque object from a distance, closer examination revealed an amorphous cloud of life that ascends from the trees into the horizon. The metaphor of life as a discordant, discontinuous cloud appears yet again as *Between the Acts* moves toward its conclusion. Attempting to lend structure and meaning to the history that they just witnessed, “They all looked at the play; Isa, Giles and Mr. Oliver. Each of course saw something different. In another moment it would be beneath the horizon, gone to join the other plays” (213). The Swithins are living an act of history situated within an age, like all ages before and after, that “was drifting away to join the other clouds: becoming invisible” (213). However, with the threat of war on the horizon, Isa cannot help but wonder if the last cloud may be drawing near: “This year, last year, next year, never” (214), she murmurs to herself.

In the final pages of *Between the Acts*, Woolf suggests that although the real nature of life, subjectivity, and history is comprised of acts—whether they be acts of thought, acts of a play, or acts of experience—that emerge from a sea of probability, humanity tends to desire the comfort and stability provided by classical concepts like linearity, causality, and determinism. For the Swithins, Isa ruminates once again on Giles, “The father of my children, whom I love and hate” (215), while Lucy returns to her copy of *The Outline of History* and Bart mindlessly recites the counting game and nursery rhyme “Tinker, Tailor.” As they were implicated in a discontinuous version of history, so also does Woolf implicate her readers in the uncertainty of the time in which they live when she concludes, “Then the curtain rose. They spoke” (219). For Woolf and



her compatriots living between the acts of the two world wars, the cloud of the present moment, shifting, in flux, changing as the factors of life do the same, will undoubtedly fade into the storm to come. What will emerge after, however, is uncertain.

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## CHAPTER 6. CONCLUSION: THE UNPRESENTABLE IN PRESENTATION ITSELF

The powerful notes of uncertainty with which Woolf concludes her final novel capture the transitory nature of British society as the country faced the terrors of World War II and its aftermath, events that would forever change both literature and science and their roles in society. Reflecting on these changes and their impact on human knowledge, Jean-François Lyotard dedicates *The Postmodern Condition: A Report on Knowledge* (1979; trans. 1984) to interrogating shifting understandings of representation and the ability of science and language to communicate truth. In his foreword to the text, Frederick Jameson explains that Lyotard's focus is "the so-called crisis of representation, in which an essentially realistic epistemology, which conceives of representation as the reproduction, for subjectivity, of an objectivity that lies outside it—projects a mirror theory of knowledge and art, whose fundamental evaluative categories are those of adequacy, accuracy, and Truth itself" (viii). Throughout this dissertation, I have approached modernism and post-Newtonian physics as belonging to this crisis of representation and investigated the ways in which the emerging concept of the unknowable catalyzed an epistemological revolution in literature and science. Print culture provided a means of dialogue and ideological exchange as authors and scientists sought to explore the implications of the unknowable and communicate them to society. As I move toward a conclusion, I would like to use Lyotard's theories of the modern and postmodern to illuminate the importance of my analysis of modernism, science, and epistemology in relation to twentieth-century conceptions of representation, knowledge, and truth more generally.

Lyotard argues that the defining epistemological feature of modernity has been a collective belief in grand narratives of legitimation, which are totalized discourses that employ

an idealized vision of the future to legitimate actions in the present. Such narratives were disrupted toward the end of the nineteenth century due to an increasing cultural concern with the “unpresentable,” a concept similar to the unknowable that denotes that which cannot be represented within a totalized discourse of knowledge. Lyotard differentiates between modern and postmodern aesthetics based on the ways that each relates to the unpresentable. According to him, “modern aesthetics is an aesthetic of the sublime, though a nostalgic one. It allows the unpresentable to be put forward only as the missing contents; but the form, because of its recognizable consistency, continues to offer to the reader or viewer matter for solace and pleasure” (81). The sense of nostalgia that Lyotard finds in modern aesthetics is a nostalgia for a lost future that has yet to be realized but continues to be sought. Within this mode of thought, the unpresentable is essentially that which has yet to be presented; while it may be missing now, it will surely (so the logic goes) be present in the future. In contrast, the postmodern “would be that which, in the modern, puts forward the unpresentable in presentation itself; that which denies itself the solace of good forms, the consensus of a taste which would make it possible to share collectively the nostalgia for the unattainable; that which searches for new presentations, not in order to enjoy them but in order to impart a stronger sense of the unpresentable” (81). Postmodern aesthetics, then, is not concerned with presenting the unpresentable but rather with expressing the effects that the unpresentable has on knowledge and experience while respecting its refusal to be represented. Crucially, for Lyotard and this dissertation, a “work can become modern only if it is first postmodern. Postmodernism thus understood is not modernism at its end but in the nascent state, and this state is constant” (79).

Lyotard thus understands postmodernism as the perpetual becoming of modernism, a form of aesthetics that is constantly probing the unpresentable and reacting to its influence.

Through these shifts and changes, modernism acknowledges and engages the unknowable and thereby undermines grand narratives of legitimation that have structured the development of Western civilization and the epistemologies that it has embraced. As I have demonstrated throughout this dissertation, literary modernism and post-Newtonian physics were simultaneously involved with developing Lyotard's explanation of the postmodern through their rejection of classical epistemological paradigms. Consequently, authors and scientists experimented with different forms of more modern discourse that better accounted for the existence and influence of the unknowable. They did not do so in isolation, however, but rather as members of an international community who were conducting a rigorous dialogue largely enabled by the rise and intensification of print culture. Books and periodicals became tools that authors and scientists could use to challenge the Enlightenment grand narrative of knowledge and implicate British society in an epistemological revolution that would usher the world into a new stage of modernity. Modernity is therefore not the unfinished project of the Enlightenment, as Jürgen Habermas would have it; instead, it has mutated into a radically different, nonclassical form of project that tends to reject linearity, determinism, and positivism as guiding concepts in favor of the nonlinear, uncertain, and unknowable. To borrow from Lyotard, modernity is a project of becoming, and literary modernism and post-Newtonian physics both reflect and contribute to the ongoing cultural break from the Enlightenment's epistemological trajectory.

Pondering the relationship between modernism and science, Mark S. Morrisson identifies two basic stages, each of which encompasses two of my dissertation chapters. According to him, "An early modernism emerges within the context of Victorian scientific paradigms that were undergoing an unsettled phase—some in crisis, some reaching widespread circulation and taking on ranges of implication well beyond their original scientific or technological origins, and some

soon to be abandoned or transformed in unanticipated ways” (31). In Chapter 1, I approached Joseph Conrad as a Janus-faced figure whose major writing phase was cultivated within a transitory cultural milieu. After the rise of scientific naturalism during the mid-nineteenth century, the dominant scientific epistemology structuring British society was focused on a material-empiricist approach to nature. A worldview steeped in notions of positivism and progress managed to spread throughout the population and educational institutions due to the scientific naturalists’ aggressive and strategic use of magazine and periodicals to promote their ideas and undermine their critics. Toward the end of the century, science was undergoing a phase of disruption and the grand narrative to which the scientific naturalists were contributing was being thrown into question. Aware that this cultural transformation dealt with the limits of knowledge and that which lies beyond the human capacity to know, Conrad employed *The Secret Agent* to both critique a strictly material-empiricist epistemology and narratively probe the effects of what such an unknowable aspect of reality could have on human experience. Although his degree of success was limited by the linguistic and ideological tools available to him, Conrad played a crucial role in initiating attempts to put “forward the unrepresentable in presentation itself,” to borrow Lyotard’s wording, and thus suggest a nonclassical form of knowledge that engages the unknowable.

My second chapter more closely examined the ways in which the rhetoric and methodology of early modernism matured alongside post-Newtonian physics and developed a complicated, yet beneficial, relationship with scientific epistemology and its cultural authority. The transformation of literature accompanied the transformation of science as important facilitators of modernism like Dora Marsden, Ezra Pound, and T. S. Eliot interacted with science in unique ways. Dedicating her attention to fostering a new form of feminism focused on



individualism rather than collectivity, Marsden incorporated the discourse of scientific vitalism into her concept of the Freewoman and delineated its meaning throughout the pages of *The Freewoman*. As she continued her editorial work with *The New Freewoman* and *The Egoist*, her ideas of feminism evolved into a much broader (and significantly more complicated) philosophy about the nature of the individual and the malleability of linguistic identity. As she pondered these issues and expressed her views on them, Marsden found inspiration in advanced knowledge of post-Newtonian physics, which helped her conceptualize her subject matter apart from a classical understanding of reality. When Pound appeared on Marsden's periodical scene, he meshed his poetic theory of imagism with Marsden's vitalistic feminism to break with the vague symbolism of previous forms of poetry. Pound approached science differently than Marsden, however, seeking to borrow its rhetoric and procedures to elevate modernism above the veneer of mass culture and promote the creation of literature as a serious truth-seeking endeavor. Through his contributions to the *New Freewoman* and the *Egoist*, among other periodicals, Pound helped modernism establish a foothold in British society that would enable the work of subsequent writers like Eliot. When he founded *The Criterion*, Eliot created a venue through which high modernism could flourish. While he acknowledged the cultural authority of science, Eliot did not need to borrow as heavily from it because modernism had by then garnered a significant degree of cultural authority for itself. He was therefore able to engage with science on his own terms and use scientific epistemology as a sounding board against which he and his contributors could test and explore their ideas.

My second set of chapters belong within a later period of modernism and science during which the two disciplines matured in their revolutions and the ways that they engaged the unknowable and set forth the unrepresentable. According to Morrisson, "A later period

encompassing roughly the 1920s and 1930s, including high modernism and the advent of surrealism, demonstrated the shared concerns of modernism and the new physics, as the mathematical formalism and increasingly unvisualizable sciences of relativity and quantum physics signaled a break with classical physics” (31). In Chapter 3, I employed Derridean deconstruction to illuminate the shared epistemological concerns between James Joyce’s first two novels and quantum mechanics. Though Joyce’s relationship with quantum mechanics would intensify in the 1930s, eventually culminating in *Finnegans Wake*, I examined *A Portrait of the Artist as a Young Man* and *Ulysses* to demonstrate that even in his earlier work prior to the widespread popularization of quantum mechanics he was grappling with similar issues of representation as physicists. Disregarding concepts of origin and absolutes in narrative even as scientists were doing so in laboratories, Joyce presents a different form of being derived from a nonlinear model of meaning production through Stephen’s unique subjectivity and his approach to truth. While deconstructive readings of Joyce’s work abound, I used Derrida’s notion of a hauntology and his deconstruction of the sign to explain the ways that Stephen’s narrative being emerges from the play of presence and absence, resulting in a hauntological subjectivity that defies traditional binaries and remains in a perpetual state of becoming. Quantum mechanics also shifted toward a hauntological approach to reality when scientists discovered the probabilistic nature of quantum objects. Put into dialogue like I have done, Derrida, Joyce, and quantum mechanics provide different postmodern perspectives on the same issues of meaning, truth, and being, as well as the role of the subject in relation to philosophy, literature, and science.

Virginia Woolf’s final two novels, *The Years* and *Between the Acts*, provided a final point of analysis about the evolving relationship between modernism and science, bringing to a close not only this dissertation but also the modernist movement. Well aware of developments in post-

Newtonian physics, Woolf was steeped in an environment in which Einstein had achieved celebrity status, his ideas (at least basic explanations of them) were widely circulated, and quantum physics was being popularized by a spectrum of authors and specialists through books and periodicals. For Woolf, the new physics provided an intriguing set of concepts and ideas that she could explore and assimilate into her ruminations on life and human experience. She was able to witness firsthand exciting developments in astronomy and physics through her personal telescope and attendance at a total solar eclipse, while also reading more technical accounts of new discoveries through the work of popular scientists like Arthur Eddington and James Jeans. As the basics of quantum mechanics became known to her and the world inched closer to war, Woolf began to perceive the weather as a useful means of probing the increasing prevalence of uncertainty in British society. In *The Years* and *Between the Acts*, she couches narratives of everyday life within frameworks of uncertain weather to depict life and experience as the products of waves of probabilities that crash at a certain moments to create human reality. This climate of uncertainty, as I have called it, represents a final vision of modernism as World War II began and both literature and science faced the consequences of the Holocaust and the atomic bomb.

The research that I have been able to conduct throughout these chapters was largely enabled by a rising emphasis in new modernist studies on the role of print culture in disseminating ideas and cultivating dialogue. While modernist authors and early twentieth-century scientists may have worked in different spheres, they belonged to a single network of cultural associations in which books and periodicals were conduits for the communication and exchange of ideas, discoveries, and modes of representation. By studying print and determining the exposure of authors and scientists to particular texts and concepts, scholars can continue to

trace the shared influences and challenges that they experienced and the ways that they adapted their language, rhetoric, and means of representation to engage the unknowable.

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