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Scriptures of the Real

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An abstract of
A thesis submitted to the Faculty of the
James T. Laney School of Graduate Studies of Emory University
in partial fulfillment of the requirements for the degree of
Bachelor of Arts/Master of Arts
in English
2011

Abstract

Scriptures of the Real
By Shalini Deepika Ramachandran

This thought experiment-thesis raises two fundamental questions: Do seemingly disparate knowledge systems aspire toward similar goals? By juxtaposing the pursuits of different disciplines, can we find new forms of communication that enable a richer production of public knowledge and transform disciplinary boundaries into a generative space?

To address these questions, I compare the creative pursuits of Albert Einstein, the father of modern physics, and James Joyce, the father of modern literature, in conversation with Jacques Lacan, Sigmund Freud's protégé as the "Name-of-the-Father" of modern psychoanalysis. All of these thinkers struggled with the inability of language to express lived experience fully. Lacan called this occluded, ineffable realm "the Real"; Einstein called it "wonder"; and Joyce called it "drama." While this thesis focuses primarily on Einstein's and Joyce's struggles against the conventions of their fields, Lacanian psychoanalysis proposes clues as to how these thinkers' troubled relationships with women impacted their choices to traverse revolutionary intellectual paths.

All three thinkers find that Real knowledge, as opposed to knowledge of reality, is only accessible experientially, gained by exploring the lacks within conventions and language. But as prolific writers, Joyce and Einstein do not eschew language completely; rather, their use of word-play, image-play, and thought experiments empowers language by giving it an experiential component, thereby creating public knowledge that can be "re-played" by readers again and again.

Yet disciplinary differences problematize free reign of this "wonder." Science relies on agreement upon evidence to propagate concepts and can thus obscure the need for epistemological inquiry of conventions (until a heretic Einstein comes along). Literature does allow itself to resonate with infinite, Real human truths—"personal woe," as Joyce wrote. But literary criticism therefore remains unable to publicly demonstrate an objective value for investigating literary "play" as science can for its findings, through falsifiable experiments.

Joyce's and Einstein's most creative works amount to powerful calls against creating expansive, "complete" theories of reality. Diving into the fundamental lack in their disciplines, the two instead discover ab-sens (playing on the French word *sens*, as in the senses or a "sense of reality"): the experiential knowledge of silence, the Real.

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Acknowledgements

I could not have written this thesis without the guidance and love of a number of very special people. First and foremost, thank you to Daniel Mitchell, my best friend and intellectual companion since sixth grade, for inspiring me and talking me through the problems and issues raised by my thesis. I am truly blessed to know you.

My parents, Umakishore Ramachandran and Vasanthi Ramachandran, have been huge sources of philosophical inspiration throughout my life. Without your love, guidance, and yummy food, I cannot imagine having written this in the short time I had to complete it. Thanks to both of you for giving me my first foray into questions of reality, Reality, truth, Truth, and the art of living.

My academic inspiration for this thesis comes from Dr. Laura Otis, my adviser who first opened my eyes to the connections between literature and science in my junior year. Dr. Otis, if there's a single class of my college career that changed the direction of my academic life and career, it's yours. Thank you for believing in me and guiding me ever since. One word of advice from you often changes my entire perspective, it's crazy. Thank you, a million times over.

The experimental nature of this thesis owes itself to the encouragement of Dr. Angelika Bammer and Dr. Anna Grimshaw. You both have inspired me more than I can say. Every student should be required to take your class on experimental texts! You both expanded my mind and understanding of scholarly work, and your influence pervades this thesis. Thank you for giving me the courage to experiment.

I am also indebted to Dr. Benjamin Reiss for his valuable insights into literature and science during the (intellectually awakening) class I took with him on sleep. Thank you for encouraging my experimental scholarly work, and thank you for believing in me.

I also am deeply grateful to Dr. John Johnston, who saw me through the first steps of conceptualizing this thesis, Dr. Sidney Perkowitz, who provided useful comments to me about interpreting concepts in physics, and Dr. Deboleena Roy, who opened my mind to the innovations of feminist science. Thank you all for your advice and insight, and a huge thank you to Emory University for providing fertile ground for boundless creativity.

Last but not least, I thank Dr. Thomas Walker, my tutor at Oxford University, who altered his tutorial on twentieth-century literature to incorporate my interest in new physics. Thank you for introducing me to eye-opening interconnections, and thank you for supporting my work.

This thesis is dedicated to Nana and Nani, for being continual sources of creative inspiration, Patti and Thatha, for opening my spiritual eye, and Amma, because there are no words to describe you.

Movements

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Prelude

WHAT IS REALISM?

> -The question is, I said, is literature to be fact or is it to be an art?
>
> -It should be life, Joyce replied, and one of the things I could never get accustomed to in my youth was the difference I found between life and literature.
>
> -Arthur Power, *Conversations with James Joyce* (qtd. in Gordon 1)

> "Science forces us to create new ideas, new theories. Their aim is to break down the wall of contradictions which frequently blocks the way of scientific progress. All the essential ideas in science were born in a dramatic conflict between reality and our attempts at understanding."
>
> -Albert Einstein, *The Evolution of Physics,* (280)

On December 7, 1921, about two hundred fifty people crowded into La Maison des Amis des Livres, the famed Parisian bookstore located at 7 rue de l'Odéon, for a much-anticipated lecture. After delaying finishing *Ulysses* for months, James Joyce had finally written the last word of his masterpiece, approved the translated French excerpts to be read aloud, and stumbled upon Valery Larbaud, the well-known French writer and critic, who offered to give the first-ever public reading and interpretation of the book.

Joyce owed much to Adrienne Monnier, the bookstore's owner, who had been instrumental in boosting his credibility in France by soliciting Larbaud to champion the book and offering Joyce much-needed financial support. Monnier's lover, Sylvia Beach, had been the first (and only) publisher to accept *Ulysses* for publication early the following year under the moniker of Shakespeare and Company. And both women had been instrumental in arranging the event of the day: the first public lecture on *Ulysses* (Ellmann, 537).

Larbaud's task was not easy. He knew he had to start off the event with a brief biographical statement on the author and, somehow, make the massive text understandable. By way of introduction, he chose to begin by comparing Joyce in literature to two other eminent thinkers in science: Albert Einstein and Sigmund Freud.

A young Frenchman was sitting in the audience that day and heard this remarkable throwaway comment that linked one of the greatest authors of the twentieth century with one of its greatest physicists. The name of the young pioneer of psychoanalysis was Jacques Lacan (Rabaté xx).

While Sigmund Freud famously declared that he knew as much about physics as his friend Albert Einstein knew about psychoanalysis[1] (that is, close to nothing), Lacan grew up in a generation enriched by these great thinkers. Born in 1901 as the first child of middle-class, Parisian Roman-Catholic parents, Lacan was influenced not only by his Catholicism, but also by his medical school training in psychoanalysis and the sciences. Unsurprisingly, he took a deep interest in Joyce's works—and would later found an entire psychoanalytical concept (*le sinthome,* which we shall discuss in detail later) on his study of Joyce's famously nonsensical second novel, *Finnegans Wake*. Lacan also befriended artists such as Salvador Dalí who were involved in the burgeoning Surrealist movement. He thus familiarized himself not only with science and psychoanalysis but also, intimately, with works of art and literature (Rabaté xix-xxviii).

While it's impossible to know the extent of the effect his attendance at the public reading of *Ulysses* had on his later intensive, interdisciplinary study of psychoanalysis, it is clear that much of today's literary theory on language draws upon Lacan's works, which freely reference optics, theoretical physics, Freudian complexes and Joycean novels in their effort to form an encompassing theory of language and society. Perhaps Lacan's chance presence at this moment in

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[1] "Einstein understands as much about psychology as I do about physics," Freud wrote to a friend in 1927 (qtd. in Isaacson, 366).

history suggests that there are deeper connections to be explored among these three fields of knowledge: literature, science and psychoanalysis.

When sudden flashes of insight, unplanned, chance meetings, or serendipitous events appear to have unexplainable causal connections in space and time, people of faith tend to consider them proofs of God's existence, like the gaps underlying quantum leaps—the phenomenon where an electron jumps from one energy level of an atom to the next without apparently traveling in between. Coincidence, and, importantly, inexplicability, often confirms faith: a traffic jam clears just as we approach it wishing for easy travel, or a comatose grandmother's eyes open after days of her family members praying for her good health. Could Lacan's coincidental presence at a lecture juxtaposing Joyce and Einstein mean that psychoanalysis could be the "and" between literature "and" science? Many scientists have critiqued psychoanalysis—especially Lacanian psychoanalysis—as little more than a religion, based on Lacan's abstruse and dense "scriptures," his theoretical seminars to his students. But if not for a *belief* that a chosen knowledge system will provide some level of *truth* about reality, why do scientists choose science and writers choose literature, different paths of knowledge to pursue? Perhaps every knowledge system demands a leap of faith—and interdisciplinary work more so than others. As this thesis is an interdisciplinary study founded on the coincidence of ideas, before we further examine the interconnections between Joyce, Einstein and Lacan, it is useful to examine the parallels between religion and knowledge systems in their pursuit of understanding.

A scripture is more than a religious text; it is an entire system of knowledge created through a text, a text empowered with authority beyond any human voice or interpreter. It is the "action or art of writing" that inscribes meaning in symbolization that transcends our ability to understand it on our own ("scripture," *OED,* def. 1). Religions arise through and around these scriptures, defined not only by interpreters, priests, mystics and prophets but also the structures and institutions that the scriptural language brings into being: churches with aisles separating

males and females, sects that operate in different nodes of a country, and positions of power vested in authorities like the high walled city-country of The Vatican.

Yet scripture is also multifarious, infinite in its meanings and iterations. The New Testament of the Bible contains four varying accounts of Jesus Christ's life, and numerous other gospels exist outside of the now-standard text that has been synthesized, edited and approved by Christian leaders throughout history—most notably by the Catholic Church in the 1545 Council of Trent as a way to consolidate religious authority ("Council of Trent"). And other religions are much the same: Hinduism's Upanishads, thought to be revelations of different enlightened seers, number more than 100 texts, of which the oldest dozen have attained a higher level of importance solely because of the work of religious scholars in the past two centuries (Olivelle xxxiii).

Writers and interpreters bring scripture into being through the necessary exclusion of parts of the story alongside the simultaneous elevation of certain details over others that they think to be most descriptive of Truth. In that sense, to write scripture is to enact Truth through one's own aesthetic, self-consciously warping and shaping the story by using the Word of the One to create infinite interpretations through its inscription as text. And yet, the Gospel of John ends with the enigmatic statement that "there are also many other things which Jesus did, the which, if they should be written every one, I suppose that even the world itself could not contain the books that should be written" (*King James Bible*, 21: 25). Similarly, the Sanskrit writers of the Upanishads shied away from describing Brahman, the Supreme Reality, instead defining It through negations: *Neti, neti*, "It is not this, it is not that" (Prabhavananda 111). What remains absent from scripture is precisely that which it seeks to describe: the experience of God, enlightenment itself.

In the same way, systems of knowledge, from physics to religion, come about through definite observations, material arrangements, texts and authority figures, forming moving and shifting tectonic plates that attempt to cover the morphing magma of Reality. Yet by nature of being, the systems create a new reality, a world of land and seas measured by cartographers who

create yet another reality of maps and satellite images of the world on screens and phones, which creates another reality of dots and coordinates, etc., and the infinite signification of reality goes on. Within these tectonic systems of knowledge lie the sacred texts and holy saints of the discipline, as well as the infinite interpretations of the gospel that seek to answer all the morphing and constitutive questions of existence. The systems of knowledge are always in pursuit of covering the magma, explaining, and issuing new ways of making sense of reality.

Then a small earthquake happens. A new finding or creation shifts the foundation of a discipline. The tremors shake all the systems, perhaps issuing new cracks in other disciplines that remain unknown to the pundits until much later, when a mystic comes along and wonders what existence would be like in a completely different reality—where all the scriptures meant something else. The new effort to glimpse the Real magma causes all the tectonic plates to shift, collide and crack, causing mountain ranges to rise up, fissures of magma to appear in trenches underneath the ocean, and fault lines to emerge. What was once considered to be reality—Pangaea, the supercontinent—becomes a completely different physical arrangement of the world, a new reality. In that way, we can see the simple commonality of all systems of knowledge, from literature to economics to physics to psychoanalysis: they all aim to explain reality, by covering Reality in some aspect, to some varying degree. As with scripture, there was never a time that the magma underneath was freely exposed to mankind; it has always been covered by the shifting tectonic plates and cartographical abstractions that obscure the experience of Reality even in these systems' aim to "cover," or express, Reality. Systems of knowledge are nothing but belief systems based on established modes of interpreting their scriptures—and facing the same inexplicability as religion.

Yet the idea of "something lacking" in our ability to explain and create knowledge has gotten significant criticism from proponents of performativity, the notion that speaking language has a material creative power that can mark physical entities, enact law and bring new social realities into being. These theorists have tried to reinform the idea of a "lack" that remains

unexplained—mostly because the idea seemingly creates "haves" and "have-nots," within systems, making inevitable the silence of downtrodden groups in society, from women to gays and lesbians.

As a way to bring their bodies back into a discourse that can inform reality, feminist theorists such as Judith Butler and recently Karen Barad have identified with the idea in quantum physics, known as Heisenberg's Uncertainty Principle, that observers mark the objects they observe through the act of observation, essentially bringing the agency of creating a reality back to the human. But this understanding throws into question the idea of an entity beyond understanding, which scientists might call objectivity. Barad, a theoretical physicist and feminist science theorist, attempted to bring back objectivity—an invaluable tool for science's pursuit—by introducing the idea of "agential-realism," which proposes that objective observations can be made as long as we define the specific experimental arrangement in which we make them. These entities, consisting of observer, material arrangement, and observation, create "phenomena," which are the moving parts of "apparatuses," a term she uses loosely to describe both linguistic and physical discourse (33). "A performative understanding of discursive practices challenges the representationalist belief in the power of words to represent preexisting things," she writes (131). Rather, the world is "iteratively reconfigured through each intra-action" of those apparatuses, which make different "cuts" in reality, "thereby making it impossible to differentiate in any absolute sense between creation and renewal, beginning and returning, continuity and discontinuity, here and there, past and future" (1). A key example of her idea would be the way that words written on a political blog or website bring new cuts in the apparatus of the Internet, which thereby can make material changes in who we might elect, as well as ideological changes in society. Token to the sweeping nature of her system, she calls it an "onto-epistem-ology" because it seeks to unite "knowing" and "being" so that matter, not just human beings, can matter in the sense of meaning and take part in the active creation of reality (185).

Perhaps it was James Joyce's and Albert Einstein's devout childhood beliefs in God that made their approaches to knowledge humbler than Barad's; or perhaps it was the exact opposite, their later repudiation of religion and dislike of claims to authority of all kinds. But Joyce and Einstein were forever concerned about the limits of knowledge. Though their inquiry eventually led to the same boundary-breaking procedures hoped for by Barad's theories of performativity, the earthquakes they caused came from their explorations of the lacks within their disciplines, as opposed to their creations of large cartographical abstractions of the whole of reality. In contrast, Barad's attempt to combine a "technoscientific" view of matter with living breathing human beings who create knowledge by marking reality essentially forms an epistemological "theory of everything" that seeks to describe in abstract the way all of reality becomes cut and reconfigured through "intra-actions" of knowledge systems (128). I find her attempt useful but ultimately unsatisfying because of the sweeping definitions that the words "apparatus" and "phenomena" take on, forgetting the inability of single signifiers to describe totalities of being without becoming stretched too thin and cracking.

Her theory is ultimately a response to linguistic structuralism, most notably attributed to Lacan, whose ideas on language have given feminist theorists no end of trouble because of the seeming hegemony of language in determining existence and constituting society, consequently leaving out those outside of patriarchal law (a point of view that is a misunderstanding of Lacan, as I will later show). Barad's pursuit, much like that of science, is one that can extend our boundaries of reality by giving agency to humans in their ability to bring matter into being (as God said "Let there be light!") and produce new knowledge at the frontiers of physical and linguistic discourse. In contrast, Lacan's idea of inner lack within knowledge seems to echo a literary mindset, which constantly looks for new understanding in already-written texts, as if there is always something lacking in existing knowledge, or "scripture."

I am interested in a turn back to Lacan precisely because of his interest in what is not there internally within established knowledge—like the experience of God in scripture written,

rewritten and sermonized over thousands of years and the magma shaping and reconfiguring the movement of these tectonic plates that we forever abstract vertically into new maps of signifying reality. My interest in James Joyce's literature and Albert Einstein's physics brought me back to Lacan because of these two iconic thinkers' preoccupation with silences within conventional thought—the insufficient axioms, conventions and presuppositions that underlay the bases of their fields of knowledge. Only through their exploration of these lacks—as opposed to a frontier beyond—did they engender revolutions in physics and literature. While Barad, following the eminent Danish physicist Niels Bohr, would say that what lay in the cuts and seams of the "fabric" of reality should not concern us, since these lacks do not exist for all practical purposes[2], following my study of Joyce and Einstein, I would say that these "ex-sist," as Lacan put it: outside existence as we know it (Barad 115-120; Lacan, *On Feminine Sexuality*, 119). To Joyce and Einstein, that which "ex-sists," like the physicist Ernest Schrödinger's "matter" wave of probability that collapses upon an act of observation to reveal a material point, is crucial to furthering our understanding and knowledge (Einstein, Przibram, Schrödinger, Planck and Lorentz 33). Lacan called this entity that ex-sists the Real.

How can juxtaposing a psychoanalyst, a theoretical physicist and a writer of literature help explain these cuts in the fabric, the fissures in the tectonic plates, and the gaps in reality? By exploring the way these three thinkers look at "lack" in knowledge, we can see that the knowledge of revolutions comes from within—a Realism as opposed to a realism. While historians of science have variously classified Einstein as a realist who firmly believed in an objective reality, independent of our observations—as Barad says "absolute exteriority is the

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[2] To reclaim grounds for objectivity in science and theory, Barad says that in making an observation, we create a Bohrian "cut" that does not emphasize an unknowability beyond the results that are inevitably altered by our acts of observation, but instead identifies that there are merely complementary choices we make in deciding what to observe and what not to observe. We are given the agency of making this choice. This "cut" in reality preserves "the condition for the possibility of objectivity" in the material arrangement defined and created by our "cut." Her theory of epistemology thus emphasizes a knowability—an "agential-realism." The nature of the "cuts" themselves—why we make them, what cuts have been progressive and regressive, what gaps lie in these cuts of knowledge—is secondary to her effort to expand the scope of her theory in encompassing all types of knowledge. See Barad 120-121.

condition of objectivity for Einstein" (173)—my study of his works shows a more complex portrait of his realism. Objectivity, Einstein writes in his 1936 essay "Physics and Reality," is a condition self-consciously based on a set of "rules" which are "arbitrary" and will only "have validity…for a special field of applications." Much like the discourse of scripture and religion, "it is [the rules'] rigidity alone which makes the game possible" (18). Thus "all concepts, even those which are closest to experience, are from the point of view of logic freely chosen conventions, just as is the case with the concept of causality," he wrote later in his "Autobiographical Notes" (13). Rather than contrasting Barad's performative view, Einstein's definition of a "condition" for objectivity appears to correlate with her notion that within specified material arrangements, objectivity can be preserved. However, Barad's purpose in defining objectivity as such is to make the "game" of an "agential reality" possible, while Einstein's focus here and throughout his work is on examining the *fictive*, manmade "rules" and conventions of science that bring about these concepts. This awareness and concern for the holes inside the assertions of classical physics parallels the internal holes in linguistic and material discourses through which Lacan theorized one can access the Real.

Similarly, Joyce, though purportedly a writer of fiction, was intimately concerned with *fact*, writing home to his family and friends in Dublin incessantly to verify such details for his book as whether it is "possible for an ordinary person to climb over the area railings of no 7 Eccles street, either from the path or the steps, lower himself from the lower part of the railings till his feet are within 2 feet or 3 of the ground and drop unhurt"—a physical feat that Leopold Bloom, a protagonist of *Ulysses*, accomplishes (qtd. in Johnson xxvi).[3] Neither scientist nor writer perceives fact and fiction as mutually exclusive entities but rather as amorphous elements that constantly shape one another in the creation of a field of knowledge, inherently troubling a Barad-like attempt at a complete theorization of an "onto-epistemological" reality.

[3] Letter sent from Joyce to his Aunt Josephine Murray on Nov. 2, 1921.

To make sure I do not make the fallacy of leaving the personal interactions and the sexual nature of human beings out of supposed "impersonal" facts of creation, I use Lacan's psychoanalysis as the third field of knowledge to reflect upon science and literature in this thesis. Though Einstein and Joyce never met, corresponded personally[4], or showed an interest in one another's work, strange parallels between them and psychoanalysis beg for study. Both Einstein and Joyce took a great interest in reading Freud's works (which would later influence Lacan). Both had children who were mentally unstable and were later institutionalized after injuring their mothers. Joyce interacted with Carl Jung during his work, and Einstein initiated a public correspondence with Freud about the formation of patriarchal ideals like nationalism and German militarism in the wake of World War I. "Is it possible to control man's mental evolution so as to make him proof against the psychosis of hate and destructiveness?" Einstein asked in a 1932 letter to Freud (Einstein and Freud 4). Freud, in his response, was most surprised and "dumbfounded" by the fundamental nature of Einstein's question. Rather than asking Freud about a "problem lying on the borderland of the knowable," Einstein had asked a simple question at the very core of existence (5).

Psychoanalysis provides insight into Joyce's and Einstein's work by questioning how the fathers of relativity and modernist literature were only able to "father" and create new, groundbreaking entities through their "copulation" with the silent, absent lack at the core of knowledge: in Lacanian thought, this silence is woman.

In the first chapter, I explore the way that Einstein and Joyce, as "fathers without motherlands," were faced with puzzling silences from female figures throughout their lives. The silences of mothers, wives and motherlands troubled and inspired them to create by exposing a "lack" in knowledge—both in their disciplines and in their personal relationships. This lack, the Lacanian Real, persists in their work, finding incarnations in Joyce's and Einstein's thought as

[4] Einstein, along with many other European intellectuals, signed a letter drafted by Joyce that condemned the illegal publishing of *Ulysses* in America without giving royalties to the author. We at least know they both knew of each other's existence!

"drama" and "wonder," respectively, which eschew signification in words or entities. The second and third chapters play out the tension between emitted concepts in discourses of knowledge and the "indeterminacies" of the reconstituting Real experience, Joyce's "drama" and Einstein's "wonder." To investigate this tension, the silences in the languages of their fields, Joyce and Einstein engaged in word-play and image-play to slip underneath monolithic signifiers like "absolute time" and "absolute space" to pursue a multifarious, Real creation of meaning. This "play" relates not only to their understanding of music as experiential meaning (that one can only glean by playing or hearing) but also to their use of thought experiments to suspend reality and go beyond the boundaries established by language, apparatuses, tectonic plates or discourses of scripture. *Experiencing* knowledge is the way Einstein and Joyce traverse the "lack"—but they can only do so by experiencing the "lack" in the first place, which manifests in their lives and work as the silence of women.

Before examining the implications of these ideas, I would like to address the scientist's well-founded mistrust of psychoanalysis as an equal tool of knowledge formation to science. It is certainly true that Lacan's ideas on language are far from "universally accepted" among linguists, literary critics, psychoanalysts, and least of all, physicists. Evoking Lacan in a thesis that deals with theoretical physics seems to awaken the sleeping giant of the Science Wars of the 1990s, started by physicist Alan Sokal's critique of the elitist and abstruse writing of postmodern theorists and their supposed misuse of scientific ideas to prove their theses. Sokal and others like Richard Dawkins have critiqued Lacan's use of mathematics to describe the psyche as "arbitrary" and have used that reason to debunk his entire system of psychoanalysis.[5] Noted linguist Noam Chomsky has called Lacan a "charlatan" and even literary critics like Norman Holland have criticized his linguistic structuralism, which deals with individual words, as outdated from modern linguistics, which deals with larger neurological processes of grammar and syntax (qtd. in

[5] As Dawkins wrote, "a philosopher who is caught equating the erectile organ to the square root of minus one has, for my money, blown his credentials when it comes to things that I *don't* know anything about" ("Postmodernism Disrobed").

"The Trouble(s) with Lacan"). Holland writes: "He uses a still- mysterious subject, language, to understand a subject that Freud and many others have made understandable, namely, unconscious processes. Rather than clarify an opacity in psychoanalysis, he has made it more opaque and arcane" ("The Trouble(s) with Lacan"). Holland, like Sokal and Bricmont, thus rejects Lacan's metaphorization of language and mathematics to describe the unconscious, as both are still-evolving studies. Turned off by the abstruseness of his theorization, even some former followers in the psychoanalytic community have left Lacan's method.

So why use a knowledge system that has been ridiculed by many? Firstly, universal acceptance should never be a standard for whether or not a thinker should be used in critical work. As with any clinical treatment—such as psychotic drug therapy doled out by psychiatrists who have studied the highly-scientific neuropharmacology—there are patients who benefit and those who do not. On the same token, given any knowledge system, there are parts of theories that make sense to creating one's ideology and parts that we discard. Hardly any scientist would agree with all of Aristotle's, Kant's or Descartes' epistemologies, but their work is still useful for having carved out different paths of approaching knowledge with which we can agree or disagree. Even Einstein's interpretation of the mathematics of general relativity is far from "universally accepted," and plenty of other interpretations have come into being (see Norton, "General covariance and the foundations of general relativity: eight decades of dispute" 1993). Likewise, Joyce's *Ulysses* was rejected by numerous publishers and was banned in the United States for some time because of its alleged obscenity. Many eminent critics at the time thought of its as nonsense.

Despite its detractors, Lacanian psychoanalysis has proven clinically useful to a large number of patients and continues to maintain a strong presence in the psychoanalytic community today. In books like *After Lacan: Clinical Practice and the Subject of the Unconscious* (SUNY Press: 2002), clinical Lacanian practitioners discuss the success of Lacanian psychoanalysis in specific cases of patients, such as in a Quebec clinic where schizophrenic and manic-depressive

young adults found relief through talk therapy (2). Just as with allopathic or psychiatric drug remedies, Lacanian psychoanalysis does not always work; however, the recent concerns surfacing about the "pill culture" for treating psychological problems like depression and anxiety are encouraging a turn back to the experiential talk therapy pioneered by Freud and refined by Lacan. While here I do not go into the benefits of psychoanalysis or talk therapy in comparison to drugs, I simply wish to make the point that the scientific "alternative" of psychiatric remedies is far from all-encompassing as a cure, as many critics are emerging to say drugs are little more than a cover-up of symptoms. While psychoanalysis rarely produces the traditional quantitative studies that have helped psychology become a science, Lacanian psychoanalysis retains self-awareness that the analyst does not know all. Lacanian psychoanalysts therefore conform treatment for each patient individually, and as such, large-scale quantitative studies are not applicable to examining its "success" or "failure."

Furthermore, I find the critiques of mathematics and linguistics raised by Sokal and others to be unsubstantial, as Sokal and Bricmont admit that they know little about psychoanalysis and were concerned with the purely mathematical interpretations of Lacan's statements—many of which they admit are sound, but "arbitrary" to the study of psychoanalysis (18). Furthermore, Holland's rejection of language as a metaphor for our subject position because of its "still-evolving" nature is exactly the purpose of Lacan's use of the metaphor: a one-to-one relationship of a symptom and diagnosis would call upon the very authoritative medical discourse that Lacan found unsatisfying to describe our complex psyches. Rather than interpreting Lacan's linguistic and mathematical references in context of psychoanalysis, these critics largely base their critiques upon Lacan's abstruseness, which Sokal says has formed a "new religion" of Lacanian followers (37).

I can hardly disagree with this last statement. Often Lacanian psychoanalysis appears to be a religion, but so do other knowledge systems like science itself. As with religion, I am interested in its persistence. What makes a discipline endure even when it is far from

representative of "truth" or "reality" in terms of its corresponding scientific "-ology"? The misuse of science or mathematics *for the purpose of proving* psychoanalytic theory is not my goal in this thesis (which founded the majority of Sokal's critique of critical theory). Rather, I came to Lacan's ideas about how signifiers were incomplete *through my study of Einstein's and Joyce's writings*. The scientist's and writer's relentless examination of silences in the existing conventions of their disciplines and in their personal lives, in the forms of women, seemed to beg for connection—which Lacanian psychoanalytic theory provides. Indeed, the Lacanian idea of a "lack" at the core of our existence finds relevance in contemporary concerns about technology, which projects our beings onto platforms that boil down our intelligence to 1's and 0's. A turn back to Lacan is a turn to looking at lack—a metaphor that extends across the disciplines of physics, literature, religion, and technology. Perhaps understanding lack will also help us understand why Lacanian thought has endured in humanistic inquiry.

By analyzing these three fields of knowledge side by side, I show that epistemological revolution come from an understanding that there is no way to describe that core lack, the Real: it is ineffable. Experience—like the meaning we glean from hearing or playing from music, visualizing numerous perspectives at once, or inventing new words—upsets old orders and brings about Real understanding. But that's not to say established language has no place; rather, language must evoke experience and understand the lacks within itself to reach toward the Real. What literature can learn from science through this study is the power of the experiment and public knowledge. Because of the difficulty of generalizing an experience of reading or understanding literature, literary critics write books and articles to expound on themes, connections and disjunctions. The resultant works are largely ignored by the everyman and read by other literary critics. But with the availability of multimedia and technology, literary criticism can and must become more experiential, calling upon new modes of signification to create knowledge that reaches more audiences, which in turn allows for the literary critic to gain new insight on the primary text *through the process* of creating new "experimental texts." While few

people outside the academy know or care to read Joyce's *Ulysses* due to its dense, allusive nature, many have basic knowledge of physics and scientific theories as a result of popular expositions of science that provide a sense of "being there," from documentaries on cable television about string theory to works written by Einstein himself that expound upon the process of his creative scientific thinking.

What if every English dissertation involved a mandatory experiential component that questions conventions of scholarly form in a way that adds to its argument? What if every physics dissertation required a philosophical and contextual review of the main scientific theories or conventions used in the experiment, as well as original epistemological ideas on the impact of the solution? While science thrives on the experiential component of experiment, it continues to feel, as the theoretical physicist and philosopher Lee Smolin puts it, a "deep need for unification" of theories and ideas, while "at any one time, there can be more than one possible way to unify the things we know—ways that lead science in different directions" (20). The study of literature, on the other hand, situates itself around the lack in our ability to comprehend texts and the correlative lack in texts' ability to signify all the knowledge they contain. Rather than pursuing a whole of knowledge, the study of literature pursues the holes in knowledge—which is precisely the nature of Lacan's, Einstein's and Joyce's revolutionary pursuits. Science, in the form of scholarly work and pedagogy in high schools, can learn from this understanding by constantly re-examining and retelling the philosophical implications of the conventions and concepts that form its basis. Psychoanalysis, in turn, can contribute to this discussion of holes and wholes by showing connections between the way we form relationships in our personal lives and the paths we take in pursuing knowledge.

Now, more than ever, the immersion of our selves and bodies of knowledge in technology shows that, as the feminist science theorist Donna Haraway put it, "the production of a universal, totalizing theory is a major mistake that misses most of reality, probably always, but certainly now" (181). The nature of technology and information is that it is always incomplete:

blogs make their existence out of being partial, forever constructing the blogger through the viewer's perception of the fonts, colors, metatags and video links on the webpage and forever under construction by the blogger's physical typing and artistic arrangements of information on the Internet. Similarly, social media profiles on Facebook or LinkedIn provide a shocking perspective of the lack behind supposedly "whole" pages (which users are prompted to fill out to "completion"). Technology thus foregrounds the sense of the being missing behind the facade.

But technology also provides us the insight that reality need not be viewed in one theoretical sense, because technology can be extensions of our minds and work, in the sense Barad's reality, and *simultaneously* representations that reveal a lack. Here, I see a connection between technology and scripture: the "It" of God remains obviously hidden in scripture as metaphors and language fail to describe one's experience of It, but scripture simultaneously brings into being a colossal external discourse that shapes reality. We have the same fantasies in knowledge and information as we do in religion, that a text attains authority and provides an encompassing theory of reality; however, as we can see from Barad's work, her great ideas about specific relations of matter and meaning become overshadowed by the sweeping nature of her theory.

Rather than a post-religion era of academics, we live in an age where knowledge systems *are* our religions. As such, we must realize that scriptures are forever under construction internally, externally, and eternally, like the Internet and technology, always incomplete and looking to improve old deficiencies to keep up with societal change. Finding new ways to talk about that which is lacking in linguistic and material discourses as well as in bodies of knowledge comes through experiential learning, not wide theorization. In contrast to the notions of performativity, experiential learning does not require that exclusions come into light by way of new acts of language or law, extensions of symbolic entities, but rather in entirely new ways of comprehending meaning that can only be described as "play" in experience. If we think about knowledge systems as based on scriptural texts that can be interpreted and reinterpreted forever,

always creating meaning but not necessarily the One we have in mind, we become ready for surprise. Willing participants in the experience of play, we will not falter whenever earthquakes—often caused by our own volitional inquiry of lack—shake the foundations of knowledge.

FATHERS WITHOUT MOTHERLANDS

Both Albert Einstein and James Joyce shared a hatred of nationalism and patriotism, a passion for understanding, a fear of religion, and a complicated relationship with their wives. Within all these commonalities emerge the differences: the writer's imagination that comes from within his own personal contexts and the scientist's imagination that thrives beyond the personal. Through Einstein's and Joyce's relationships with Father Gods, Mother(lands), and their wives, I hope to show the differences between the commonalities of their lives—which will reflect not only on Lacanian psychoanalysis, the third knowledge system explored in this thesis, but also on their approaches to their creative work.

Against Father God

As young Albert Einstein was learning how to speak sometime after age 2, he developed a peculiar quirk that made his family maid call him *der Depperte*, or the dopey one. Before he spoke any sentence, he would whisper each word to himself until he was sure the sentence was perfect enough to say aloud. "He had such a difficulty with language," recalled his younger sister Maja, that their parents, Hermann and Pauline, feared he would never talk properly (qtd. in Isaacson 8). Though he began speaking normally by age seven, his mistrust in language's ability to convey meaning would remain throughout his life.

Born in 1879 to a family of non-observant Jews who had settled down in Ulm, Germany, Einstein quickly earned the nickname "Father Bore" from his governess as a child. Though

cousins and neighbors' children would often play in his backyard, "from the beginning he was inclined to separate himself from children his own age and to engage in daydreaming and meditative musing," said his longtime friend Philip Frank (qtd. in Isaacson 12). While socializing would never appeal to him, the events that did move him as a child would stay with him forever. Around age 4 or 5, he was lying in bed sick, and his father brought him a compass. "That this needle behaved in such a determined way did not at all fit into the nature of events," he later recalled in his "Autobiographical Notes*."* Observing the needle influenced by an invisible magnetic field made a "deep and lasting impression" on him, invoking in him a lifelong, childlike wonder about those things which, as adults, we take for granted like "the falling of bodies…wind and rain…the fact that the moon does not fall down". The observation that an unseen field was directing the movement of the needle—rather than a touch that directs mechanical objects—made Einstein feel that "something deeply hidden had to be behind things" (Einstein, "Autobiographical Notes" 9).

As he grew up the lone Jewish student in a Catholic school, his interest in what lay "deeply hidden" brought him to religion—and probably gave him the strength to withstand the anti-Semitic insults he faced throughout his schooling. Even as a child growing up, he said he had "a lively sense of being an outsider" (qtd. in Isaacson 15). Children would physically attack and insult him on his way to and from school. In response, he retreated into his own world: he would compose hymns on God that he would sing to himself as he walked home from school, and he became a strictly observant Jew, refusing pork and keeping kosher unlike the rest of his family (Isaacson 16; CPAE 1: xix-xx).

However, after he started reading a popular science book series called *People's Books on Natural Science*, he "soon reached the conviction that much in the stories of the Bible could not be true" (Einstein, "Autobiographical Notes" 5). He began to reject the "traditional education-machine" of "deep religiosity" fostered by his Catholic schooling, which resulted in a "positively fanatic orgy of freethinking coupled with the impression that youth is intentionally being

deceived by the state through lies; it was a crushing impression" (5). His fall from the "religious paradise," as he called it, was his first repudiation of authority—an act that he would only repeat as he got older, to professors, superiors and the monolith of Newtonian physics itself. His flight from religion was also related to his evolving sentiment that a global view was preferable to narrow-minded fervor: it was his "first attempt to free myself from the chains of the 'merely-personal,'" an existence dominated by "wishes, hopes and primitive feelings" (5). While embracing authority and religious truths would result in aiding a false pursuit of personal desires, he saw his rejection as what led him, instead, to "contemplation of this world" (5).

Even from a young age, James Augustine Joyce, too, showed far more interest in hellfire than heaven, in Luciferian defiance rather than piety. The first memory his young brother Stanislaus Joyce recounts in his memoir *My Brother's Keeper* is James' role in setting up a dramatic performance of Adam's and Eve's fall from paradise, produced by the children for their parents and the nurse-maid. James made Stanislaus play Adam and his sister, Eve. He reserved the most important role for himself: the serpent. Wriggling across the floor wearing a "rolled-up sheet or towel" to represent the snake's long tail, James would play "the Tempter"—a childish instinct of disregard for the morally upright Adam or Father God (S. Joyce 1-2). When he wanted to punish one of his other siblings, he would put on a red stockingcap, imprison the child underneath an overturned red wheelbarrow, and make gruesome noises to indicate hellfire. The Catholic idea of original sin—which he would describe as "that sense of separation and loss"—would haunt him throughout his life, even though his beliefs veered far from those of Catholicism as he matured (Ellmann 42).

Born about three years after Einstein to a middle-class Irish Catholic family in Dublin, Joyce was the eldest of ten surviving children and the life of the neighborhood play. As opposed to "Father Bore," Joyce was called "Sunny Jim" by his household because of his serenity and playmaking, always coming up with stories and skits to entertain the other children. His devotion, however, rivaled the piety of young Einstein. He was deathly afraid of thunderstorms. Every time

he saw a lightning flash, he would cross himself and say, “Jesus of Nazareth, King of Jews, from a sudden and unprovided for death deliver us, O Lord,” as he was taught by his pious governess. Thunderstorms would forever remind him of God’s wrath and strength—and he would never stop trembling at the mere sound of thunder. After he got older, a friend asked him why storms frightened him so much. His reply: “You were not brought up in Catholic Ireland” (Ellmann 25).

Like Einstein, Joyce grew up surrounded by Catholicism. His first schooling was at Clongowes Wood College, a Jesuit school where he excelled in all subjects, especially religious education (Ellman 29). He received confirmation into the Catholic faith at Clongowes, and he adopted the name of Saint Aloysius—the saint who particularly impressed Joyce because he would not embrace his own mother, fearing that contact with women would lead him off his path to God (30).

Joyce’s piety would only reach a breaking point when he was attending another Jesuit college, Belvedere, as a young man and decided to have his first sexual experience with a prostitute as he walked home from the theater. He was fourteen. Wrestling with his guilt over the next few months, he confessed at a chapel and went into a “reformation” stage of piety, where he would say the rosary devoutly on his way to class. But his religiosity would not last much longer; it was more like a “last spasm of religious terror,” as his biographer Richard Ellmann put it (50). Instead, Joyce would begin thinking of art as a religion, calling his first works of writing “epiphanies,” borrowed from the Christian term describing the physical manifestation of Christ as the Son of God to the three wise men. It seemed that intertwined in Joyce’s and Einstein’s first acts of rebellion—against religion—was the consequent turn to a more creative form of expression in art and science. But Father God would never quite leave them.

Leaving Mother(lands)

The teenage Einstein hated his early schooling at the Munich Gymnasium. The regimented learning, he later recalled, "seemed very much akin to the methods of the Prussian army, where a mechanical discipline was achieved by repeated execution of meaningless orders" (Isaacson 21). He duly rebelled, got punished by teachers and eventually took a train across the Alps to Italy and told his parents that he would never return to Germany—not only to get away from the oppressive schooling, but also to avoid mandatory enlistment in the military when he would turn seventeen a year later (23). After revoking his German citizenship, he set his heart on attending Zurich Polytechnic in Switzerland to study physics. To prepare for the entrance exams, he spent one year at a school in the Swiss village of Aarau, where he stayed with the family of a professor named Josh Winteler.

The Wintelers would have a marked impact on Einstein's development. Josh Winteler disapproved of German militarism as much as Einstein did and introduced the impressionable teenager to ideas like "world federalism, internationalism, pacifism…with a strong devotion to individual liberty and freedom of expression," according to Einstein's biographer Walter Isaacson (27). While Einstein's mind expanded beyond the ranges of his motherland, he fell in love with a girl who exemplified motherly comfort: Herr Winteler's daughter, Marie.

The flighty and feminine Marie provided love to Einstein without asking for much back, even as he left for Zurich Polytechnic. He sent her baskets of dirty laundry, and she washed the clothes and mailed them back—even when there was no note attached. Once, she wrote of "crossing the woods in the pouring rain" to mail the clothes. "In vain did I strain my eyes for a little note, but the mere sight of your dear handwriting in the address was enough to make me happy," she wrote (qtd. in Isaacson 40; CPAE 1: 29). Her motherly attentions did not stop there: she also told him about a little first grader named Albert who "shared with you a facial feature" and whom she loved "ever so much." "It's sometimes quite strange, something comes over me

when he looks at me and I always believe that you are looking at your little sweetheart," she wrote in late November 1896. Albert the boy and Albert the young man were one and the same to her ("From Marie Winteler," CPAE 1: 30-31).

Eventually, Einstein would stop sending letters and even his dirty laundry to her in hopes of breaking off the relationship. Marie persisted for some time until he sent a letter to her mother, ending the relationship and providing a flash of foresight into his future relationships with women:

> It fills me with a peculiar kind of satisfaction that now I myself have to taste some of the pain that I brought upon the dear girl through my thoughtlessness and ignorance of her delicate nature. Strenuous intellectual work and looking at God's nature are the reconciling, fortifying yet relentlessly strict angels that shall lead me through all of life's troubles. If only I were able to give some of this to the good child. And yet, what a peculiar way this is to weather the storms of life—in many a lucid moment I appear to myself as an ostrich who buries his head in the desert sand so as not to perceive the danger. ("To Pauline Winteler," CPAE 1: 32-33)

Marie had provided a motherly source of comfort during his early struggles at Zurich as he sparred with antagonistic teachers. But soon the "desert sand" of his science proved more fulfilling to him, and just as he revoked citizenship of his motherland to pursue a non-German education, he let go of Marie's motherly attentions as he became more serious about physics.

Joyce's first departure from Ireland was as symbolic to him as Einstein's revocation of the German citizenship. After trying and failing to pursue medical studies at Dublin's Royal University—in part because of the shortage of money due to his father's excessive drinking and in part because of his own truancy from classes—Joyce decided rashly to try his luck studying medicine at the University of Paris. His parents and literary mentors advised against it, but the 20-year-old was set on leaving Ireland and seeking his own fortune. In a letter to Lady Gregory, a mentor and leading figure in the Irish literary revival, he displayed his immature sense of heroism and exile from his homeland: "I shall try myself against the powers of the world," he wrote, "And though I seem to have been driven out of my country here as a misbeliever I have found no man yet with a faith like mine". On December 1, 1902, he left by boat for Paris (Ellmann 111).

During his first stay in Paris, Joyce's life was poverty-stricken and miserable. He attempted to join medical school, but the session had already started. His efforts to teach English to earn money were half-hearted and left him scrambling, starving, and writing home in need of extra money. His lifeline throughout was his patient mother, Mary Jane (May) Murray Joyce:

> Dear Mother
> Your order for 3s/4d of Tuesday last was very welcome as I had been without food for 42 hours (forty-two). Today I am twenty hours without food. But these spells of fasting are common with me now…"

So he wrote on Feb. 21, 1903 (qtd. in Ellmann 126). His mother responded on March 2, asking him not to despair, "for I still feel full of hope for you and this month will tell a great deal." She urged him to "keep all your friends" because "you cannot get on in your line without friends" (qtd. in 128).

But merely a month later on Good Friday, Joyce received a shocking telegram: "MOTHER DYING COME HOME FATHER" (qtd. in 133). After he arrived in Dublin, his mother, suffering from cancer, begged him in the days following Easter Sunday to take communion and make confession. But Joyce refused. In *A Portrait of the Artist as a Young Man*, Joyce's autobiographical character Stephen Dedalus says of the moment that he feared the "chemical action" that would occur in his soul "by a false homage to a symbol behind which are massed twenty centuries of authority and veneration" (qtd. in 134). May Joyce wept and vomited green bile into a basin, but Joyce remained inflexible to her request that he submit to the Catholic tradition. His Aunt Josephine Murray apparently argued with him (and would forever partly blame his mother's death on him), but Joyce merely replied "I believe in a Supreme Being" and would not proclaim any further tenets of faith (qtd. in 134).

After five long months of struggling with illness and her husband's increased alcoholism, May Joyce died on August 13, 1903, surrounded by her family (134). At her deathbed, Joyce's Uncle John knelt to pray and "made an angry peremptory gesture to us to kneel down," wrote Stanislaus Joyce in his memoir (*My Brother's Keeper* 230-231). Neither he nor James did.

Stanislaus later wrote that his mother's "docility to her clerical counselors sank into [James'] soul and gradually estranged him from her." James associated her not only with the Catholic Church but also the ideal of Irish femininity that he felt made her into the frail, oppressed, baby-making machine she became. James later wrote about how his mother's death seemed connected to the Irish social order:

> My mind rejects the whole present social order and Christianity—the home, the recognized virtues, classes of life, and religious doctrines. How could I like the idea of home? My home was simply a middle-class affair ruined by spendthrift habits which I have inherited. My mother was slowly killed, I think, by my father's ill-treatment, by years of trouble, and by my cynical frankness of conduct. When I looked on her face as she lay in her coffin—a face grey and wasted with cancer—I understood that I was looking on the face of a victim and I cursed the system which had made her a victim. We were seventeen in family. My brothers and sisters are nothing to me. One brother alone is capable of understanding me.[6] (Joyce, *Selected Letters* 25)

Entangled in Joyce's resentment toward his mother was her complicity with the motherland's social orders, which slowly killed her. Einstein too saw Marie as a representative of an old German social order incompatible with his new cosmopolitanism. Both Joyce's and Einstein's rejections of their motherland's system of values were intertwined with their repudiations of these mother figures who sustained them through their first years truly on their own. The forced exit of these "mothers" from their lives led to the entry of two new women who would trouble the idea of social orders as they knew it.

Rebellious Wives

Joyce met Nora Barnacle, a chambermaid at Finn's hotel, sometime in early June 1904. The daughter of a baker, Nora had run away from home after her uncle beat her with a walking stick after discovering her (sexual and emotional) relationship with a local boy. But her disregard for social order extended to a time before that: an old friend of hers named Mary O'Holleran remembered that they would often "dress up in men's clothes" and "ramble around the

[6] Letter from Joyce to Nora Barnacle on Aug. 29, 1904.

square…our hair stuck up under our caps" (qtd. in Ellmann 165). Joyce's letters indicate that Nora was the first to initiate sexual contact between them after their first walk together on June 16, 1904 (the day that, by no coincidence, would later become the day the action of *Ulysses* takes place). In contrast to Joyce's quiet, feminine, nurturing mother, Nora was both rebellious and overtly sexual, as their pornographic love letters from 1909 show. Joyce was attracted to her defiant spirit and rejection of Catholic notions of "sexual purity": "I am nauseated by their lying drivel about pure men and pure women and spiritual love and love for ever: blatant lying in the face of truth," James wrote to his brother in 1906 (qtd. in Scott 33).

Nora's repudiation of the norms of Irish womanhood matched Joyce's less-than-reverent ideals. In long letters to Nora soon after they met, he enumerated how he "cannot enter the social order except as a vagabond," and how he had left the Catholic church six years previously, "hating it most fervently" (Joyce, *Selected Letters* 26). He felt that Nora was the source of his motivation to fight the social order: "It seemed to me that I was fighting a battle with every religious and social force in Ireland for you and that I had nothing to rely on but myself. There is no life here—no naturalness or honesty. People live together in the same houses all their lives and at the end they are as far apart as ever." (30). All the while, as James' and Nora's love grew, he wrote more and more of its inexpressibility, saying that he "detest[ed]" the "cold written words" on the page.

> In a way it seems to me a pity that we do not say more to each other and yet I know how futile it is for me to remonstrate either with you or with myself for I know that when I meet you next our lips will become mute. You see how I begin to babble in these letters. And yet why should I be ashamed of words? Why should I not call you what in my heart I continually call you? What is it that prevents me unless it be that no word is tender enough to be your name?" (31)

Something about Nora's brashness found Joyce at once detesting words and inspired to write about his art. "You asked me to write you a long letter but I really hate writing," wrote the celebrated writer in a long letter, "it is such an unsatisfactory way of saying things" (32).

Mileva Marić similarly inspired Einstein to ruminate at once on his discipline, contemporary physics, and the inexpressibility of words. In May of 1901, Einstein wrote to Marić, "This evening I sat 2 hours at the window and thought about how the law of interaction of molecular forces could be determined." He ended the letter with "Writing is stupid. Sunday I am going to kiss you orally" ("To Mileva Marić," CPAE 1: 173).

Mileva Marić, like Nora, was not the typical feminine woman that Marie Winteler represented to Einstein. A Serbian, she was a dark brunette three years older than Einstein, born with a congenital limp and prone to bouts of tuberculosis and depression. However, unlike Nora, who only received a meager convent education and finished schooling at age 12, Mileva was determined to earn a Ph.D. and become a physicist. All of her correspondence with Einstein after they met at Zurich Polytechnic in October 1896 mention a mutual love for physics and an interest in rational inquiry (Isaacson, 42-47). In her first letter of response to Einstein, she writes "I do not believe the structure of the human brain is to be blamed for the fact that man cannot grasp infinity. Man is very capable of imagining infinite happiness, and he should be able to grasp the infinity of space—I think that should be much easier" ("From Mileva Maric, 20 Oct. 1897," CPAE 1: 34-35).

Mileva's dark intellectuality attracted Einstein. He wrote her, "How proud I will be to have a little Ph.D. for a sweetheart" and felt that the two understood each other's "dark souls so well" (qtd. in Isaacson, 44-45). In a field dominated by males, her steadfastness and interest in physics inspired Einstein and reaffirmed his own repudiation of social orders. "We'll diligently work on science together so we don't become old philistines, right?...You'd better not get that way. It would be terrible. You must always be my witch and street urchin. Everyone but you seems foreign to me, as if they were separated from me by an invisible wall." (75). Though Mileva was the foreign one—the Eastern European woman in a Swiss technical college—her position outside the norms attracted Einstein, who viewed himself in much the same light. In a way, the ability for Mileva and Nora to take on the roles of men—rejecting Catholic terms of

femininity, competing in a man's world of physics—attracted Joyce and Einstein because they bolstered their own rebellious philosophies. Indeed, both couples had their first children out of wedlock; the institution of marriage, to Einstein and Joyce, always felt like a "troublesome burden of belief," as Joyce put it (*Selected Letters* 61).

Letters and Silences

While Joyce stayed more or less in love with Nora for the rest of his life, Einstein strayed from Mileva, first mentally and then physically. The letters between the couples uncover telling silences in their relationships that might have contributed to the Joyces' endurance and the Einsteins' divorce.

Nora Barnacle was not an intellectual in the worldly, cosmopolitan sense of Joyce: she only picked up Triestine Italian slowly after their move to Italy; she wrote in ungrammatical, unpunctuated run-on sentences; and she did not care much for reading or studying philosophy. While Joyce wrote her long, introspective prose letters, she often wrote back short letters full of grammatical errors and appeared to be vaguely confused by his writing: "I read that long letter [about rejecting the Church and the social order] over and over again but could not understand it I think I will take it to you to morrow eve—and perhaps you might make me understand it" (qtd. in Maddox 60). Joyce alternatingly found her sub-literacy maddening and attractive. In October 1906, Joyce commented on Nora's run-on sentences to Stanislaus, after enclosing her letter to him:

> Dear Stannie
> I hope you are very well I am sure you would be glad to see Georgie now he is well able to run about he is able to say a lot he has a good appetite he has eight teeth and also sings when we ask him where is Stannie he beats his chest and says nonc'e piu
> Nora

Joyce does a "reading" of Nora's letter to Stanislaus and, tongue-in-cheek, points out the "gigantic strides…towards [Nora's] culture and emancipation" that the above letter represents. "The evening before last I found her stitching together skins of apples. She also asked me some time ago 'Is Jesus and God the same?' and asked me to teach her geography! Do you notice how women when they write disregard stops and capital letters?" (*Selected Letters*, 116) Many critics have linked Nora's run-on sentences with those of Molly Bloom in *Ulysses*, and the similarities are quite compelling. Like Molly, Nora had little regard for literature, as Joyce wrote to his brother in January 1905. "You know I have no-one to talk to. Nora, of course, doesn't care a rambling damn about art…when she saw me copy epiphanies into my novel she asked would all that paper be wasted" (51). In that regard, Joyce's stature as one of the greatest writers of the twentieth century hardly seemed to impress or affect her as his fame grew; nine months after *Ulysses* was first published, she had only read "as far as page 27 counting the cover," wrote a slightly miffed Joyce to his Aunt Josephine in late 1922 (62).

Mileva, as an educated woman in Einstein's field of study, understood both the intelligence and stature of her husband and wrote long and detailed letters about her thoughts on science and life to Einstein and her friend Helene Savić. In the last twenty years, historians of science such as Charles S. Chiu have uncovered a number of clues that point to her involvement in helping Einstein develop special relativity. In 1901, Einstein wrote to Mileva, "How happy and proud I will be when the two of us together will have brought our work on the relative motion to a conclusion" ("To Mileva Marić, 27 March," CPAE 1: 161). When he finished a draft in June, Mileva wrote that "his body buckled and he went to bed for two weeks" while she "checked the article again and again." They both got rip-roaring drunk and sent Einstein's friend Conrad Habicht a postcard that simply said, "Both of us, alas, dead drunk under the table" (qtd. in Isaacson 135).

Einstein would later tell Mileva's friends in Serbia that "I need my wife…she solves all the mathematical problems for me" (qtd. in Isaacson, 136). Chiu points to Einstein's struggles

with developing an adequate mathematical equation for general relativity after he and Mileva separated as a sign that she may have played a substantial role in special relativity. In his "Autobiographical Notes," Einstein writes that he neglected mathematics in school because he not only had a "stronger interests in the natural sciences" but also "saw that mathematics was split up into numerous specialties, each of which could easily absorb the short lifetime granted to us" (15). It was the multiplicity of mathematical realms, its infinite nature, that led him away from it toward the more stable (or so he thought) study of physics. In the midst of his and Mileva's disagreements in 1913, he suddenly implored his friend Marcel Grossman for help: "I have encountered mathematical difficulties which I can not conquer. I beg of you, help me, because I think I'm going mad" (qtd. in Chiu 43). Most stunningly, the Russian physicist Abraham Joffe, who had evaluated the original manuscripts of Einstein's 1905 special relativity paper before they were lost, claims the paper was submitted under the name "Einstein-Marity," referring to the Hungarian equivalent of "Marić." The same spelling was used in Mileva's obituary in 1948 (44).

Regardless of the implications, Mileva never made any claim to Einstein's theories later in life, despite the bitterness that would ensue between her and her former husband. Indeed, Einstein went on to successfully conceptualize the math behind general relativity without her, though he never again had a "miracle year" of breakthrough ideas as he had in 1905, while they were still together. Isaacson and most other biographers say that while she might have been a sounding board for Einstein, it is doubtful that she had claim to much of the development of his scientific theories.

But it was obvious what Mileva wished to think of any of their work together. During the happier days, she, Einstein and Paul Habicht had constructed a device to measure electrical currents. It was registered in the Swiss patent office and described by Einstein in detail for an article in the *Journal of Physics*. In both the patent document and the publication, the inventors of the device are listed as "Einstein-Habicht." Paul Habicht wanted to know why her name wasn't

on it, and she apparently replied to him that "Albert and I, we are after all just one stone," (*ein Stein*) (Chiu 41).

However, as their marriage progressed, Mileva became increasingly jealous of Einstein's success. After she became pregnant with their illegitimate baby, she was unable to concentrate on her studies and ended up failing her Ph.D. examinations a second time. She would never go back to school to get the doctorate she had dreamed of earning. While her husband became world-famous as a physicist, she was relegated to the home. She wrote to her friend Helene in the winter of 1901 that Einstein was applying for a job in Vienna and hoped to continue improving himself in theoretical physics so that he could become a professor. "What is to happen to me, whether I will really get a job in a girls' high school, is all in God's hands," she wrote (Einstein-Marić 72).

As opposed to Nora's apparent indifference to Joyce's art or her role in it, Mileva fully understood what her role would be in history. She wrote to Savić in 1909 that "all that fame does not leave a lot of time for a wife. But what can be done, one person gets the pearl and the other just gets the shell?" ("Einstein's Wife"). After a talk that Einstein gave in October 1911, she wrote him that she "would like to have been there and listened a little, and seen all these fine people" (qtd. in Isaacson 172) Her jealousy and sense of failure that she was not able to penetrate the world of physics as she had dreamed played a large part in the unraveling of their marriage in 1912.

Nora, on the other hand, was never jealous of Joyce, and her girlish idealizations of him ended soon after the harsh reality of their poverty in Trieste, Italy hit them. She would later write to her sister, "He's a weakling, Kathleen. I always have to be after his tail. I wish I was married to a man like my father" (qtd. in Maddox 14). On multiple occasions, Joyce wrote to his aunt and brother that "Nora does not seem to make much difference between me and the rest of the men she has known," marking his fear of inadequacy despite the fact that at other times, he made fun of her "untrained mind" (qtd. in Ellmann 222). In particular, her silences drove him to write some of his most passionate letters, which depict women as encompassing and capable of all

opposites—man and woman, whore and virgin, simplicity and complexity, passion and indifference, Ireland and the world.

Twice in 1909, Joyce went to Dublin: first to sign his contract for his short story collection *Dubliners* and second, to set up a cinema. It was the first time he and Nora were separated since their elopement, and neither took it well—least of all, Joyce. During his time there, he often saw an old friend named Vincent Cosgrave, whose life was "consecrated to idleness," according to Ellmann (288). Cosgrave, looking to puncture Joyce's ego, told him one day that while Joyce had been seeing Nora in 1904, Nora was also going out on walks with Cosgrave on alternate days (288-290).

Joyce was beside himself in anguish. He immediately wrote Nora an accusatory letter telling her his "eyes are full of tears, tears of sorrow and mortification" and his "heart is full of bitterness and despair" (*Selected Letters* 158):

> O Nora is all to be over between us?
> Write to me, Nora, for the sake of my dead love. I am tortured by memories.
> Write to me, Nora, I loved you only: and you have broken my faith in you.
> O, Nora, I am unhappy. I am crying for my poor unhappy love.
> Write to me, Nora.
>
> Jim

Joyce certainly was not a virgin when he met Nora, but he was obsessed with her virginity, as he wrote the next morning (after a night of sleeplessness): "Is Georgie my son? The first night I slept with you in Zurich was October 11th and he was born July 27th. That is nine months and 16 days. I remember that there was very little blood that night. Were you fucked by anyone before you came to me?" (*Selected Letters* 158). Nora did not write back; she was beside herself thinking what to say to him to console him, as she had rejected Cosgrave's advances (which Stanislaus knew too). Joyce consulted with one of his friends in Dublin, J.F. Byrne, who affirmed his faith in Nora's purity. Still, Joyce was not consoled; his Catholic appraisal of the standards of feminine purity still infiltrated his mind despite his so-called rejection of the religion's social order.

After twelve days of silence from Nora, Joyce wrote her again, telling her he was "terribly upset that you haven't written" and apologizing profusely: "My sweet noble Nora, I ask you to forgive me for my contemptible conduct…Don't read over those horrible letter I wrote. I was out of my mind with rage at the time" (*Selected Letters* 160). Nora finally responded, telling him that she was reading his first collection, *Chamber Music*. She did not mention the incident at all. Her prudent silence agitated Joyce to no end, provoking him to write long, self-reflecting letters on love and his treatment of Nora: "Have I been cruel to you?" "I am a jealous, lonely, dissatisfied proud man" (174) "What can come between us now? We have suffered and been tried. Every veil of diffidence seems to have fallen from us" (163).

The letter exchange that he intiated between them, by way of reconciliation, brought up intertwined images of sexuality and holiness:

> I wonder is there some madness in me. Or is love madness? One moment I see you like a virgin or Madonna the next moment I see you shameless, insolent, half-naked and obscene. What do you think of me at all? Are you disgusted with me?

He associated her both with Ireland and what lay beyond: "I thought I heard my country calling towards me, or her eyes being turned toward me expectantly. But, O my love, there was something else I thought of. I thought of one who held me in her hand like a pebble from whose love and in whose company I have still to learn the secrets of life" (Ellmann 296). Nora figures here as the "something else" beyond "my country" that could lead him to the "secrets of life." Her image as a goddess grew in Joyce's mind:

> 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. Take me into your soul of souls and then I will become indeed the poet of my race. I feel this, Nora, as I write it. My body soon will penetrate into yours, O that my soul could too! 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!
>
> My holy love, my darling Nora. O can it be that we are now about to enter the heaven of our life? (qtd. in Ellmann 296-297)

As much as Joyce wanted to leave behind his homeland and his mother's stifling Catholicism, Nora encompassed those very characteristics of feminine purity and holiness as well in Joyce's mind. The sexual images of his body penetrating her are coupled with his desire to "nestle in your womb like a child born of your flesh and blood." Their love, here, is "holy" and angelic and reminiscent of a mother and child's unity, while his other letters call her his "little fucking whore" and graphically describe their sexual exploits as a "hog riding a sow." The androgyny he perceived in her rebellious nature finds manifestation in all manner of opposites in these letters. By virtue of her silence, Nora became Joyce's "everything" (*Selected Letters* 181).

Throughout this "exchange," Nora merely sent him a few pornographic notes and left him always pining for her words. On September 7, he wrote "days and days have passed without a letter from you…" (169). "Her slightest word has an enormous power over me," he wrote two months later. Despite Nora's lack of Joycean mastery over language, her silence provoked him intellectually and sexually and made him question his attitudes and wonder about the nature of their love. The images of Nora here as compared to those from his previous letter to Stanislaus on her "untrained mind" show the power of her deliberate silence. Not only was she already the rebellious, sexual, androgynous Nora he initially fell in love with, but also she gained degrees of spirituality and seemed to encompass those motherly aspects of Ireland and May Joyce that Joyce had earlier repudiated.

In short, Nora provided Joyce with enigma throughout their relationship. She was never the doting wife, threatening to leave him many times for his drunken behavior. She later famously said, "I wish I had never met anyone of the name of James Joyce" (qtd. in Ellmann 700). In one of the love letters Joyce wrote her in 1909, he asks her plaintively why she disagrees with him. He describes a time that they had passed a priest and he had asked her "Do you not find a kind of repulsion or disgust at the sight of those men?" Nora had answered "No I don't" and it stung Joyce. "Are you with me, Nora, or are you secretly against me?" (qtd. in Ellmann 314). Her

disregard for Joyce's artistic prowess only served to puzzle Joyce into thinking that she had some "secrets of life" beyond what he could grasp.

While we can never know fully what her ideas on knowledge and art were, it is a mark of society's measurement of intelligence through an individual's ability to use language that Nora's minimal prose and lack of letters have amounted to critical perception (and, at times, Joyce's) of her lacking acumen. Rather, even in her silence—in the historical archive and to Joyce during those months apart—she created the image of a woman who seemed to transcend boundaries of identification.

While Mileva's large collection of letters spell out her hopes and seek to inquire into science to keep up with her eminent spouse, she never stayed in Einstein's imagination as Nora implanted herself into Joyce's. Perhaps the key to Mileva's problem was her wholehearted embrace of language and her attempt to portray all through it, leading to the biggest silence of her history with Einstein: Lieserl—their illegitimate child.

Mileva gave birth to Lieserl after a difficult labor in Serbia in February 1902. At first, Einstein sounded excited about the baby, asking in letters, "is she healthy and does she cry properly?...I love her so much and don't even know her yet!" ("To Mileva Maric, 4 Feb. 1902," CPAE 1: 191). But the initial excitement quickly turned to caution as Einstein landed his famous position at the Swiss patent office—where an illegitimate child would have been seen as unfitting. "The only problem that would remain to be solved would be how to keep our Lieserl with us," wrote Einstein. "I wouldn't want to give her up." Lieserl later came down with scarlet fever, and Einstein wrote to Mileva asking "How is Lieserl registered? We must take great care, lest difficulties arise for the child in the future" (qtd. in Isaacson 86). While many scholars believe she died of scarlet fever in 1903, others think that Mileva's friend Helene Savić adopted the little girl and raised her. Einstein wrote to Mileva in September 1903 about having a "replacement" child—who would turn out to be Hans Albert Einstein. Though little Albert brought back some joy to their relationship, the pall of Lieserl cast a shadow over Mileva and

their marriage. Shortly after Einstein died (and before the existence of Lieserl was discovered through their letters), a writer named Peter Michelmore interviewed Hans Albert Einstein and wrote on Mileva:

> Something happened between the two, but Mileva would say only that it was 'intensely personal.' Whatever it was, she brooded about it, and Albert seemed to be in some ways responsible. Friends encouraged Mileva to talk about her problem and get it out in the open. She insisted that it was too personal and kept it a secret all her life—a vital detail in the story of Albert Einstein that still remains shrouded in mystery. (88).

A big scholarly expedition to "find" the real Lieserl only ended in finding remnants of the tracks that Mileva, Einstein and their close friends had carefully covered: letters burned and history erased. Very few letters remain documenting her existence.

Indeed it was Mileva's pregnancy with Lieserl that interrupted the final doctoral examinations that she failed, crushing any chance of her making a name in physics. She would remain largely glossed over in historical accounts of Einstein until interest in Lieserl led scholars back to her letters in the late twentieth century—which is when they discovered her possible hand in his work. Her attempt to write herself into history, either through an academic career or by being a woman of letters, seemed fruitless; instead, it was the silence of Lieserl that brought her story to light.

Her depression, which Einstein linked to "a schizophrenic genetic disposition coming from her mother's family," would only worsen over the years (Isaacson 172). Meanwhile, during this low period of their marriage, Einstein visited Berlin in 1912 and began a romance with his cousin Elsa, whose "conventionally handsome and domestically nurturing" personality, according to Isaacson, completely contrasted with the dark intellectual figure cut by Mileva (182). Elsa was a German Jew and represented everything that he had come from. His letters with Elsa took on the tone of those he sent to Marie Winteler; flirty, unintellectual and nurturing. "I now have someone I can think about with pure delight and I can live for," he told her (qtd. in Isaacson 182). To his credit, he tried to keep his marriage together for some time, telling Elsa "I treat my wife as an employee whom I cannot fire," but eventually, the strain became too much.

In mid-July 1914, Einstein sent Mileva this note through a friend:

Conditions.

A. You will make sure
    1. that my clothes and laundry are kept in good order;
    2. that I will receive my three meals regularly *in my room;*
    3. that my bedroom and study are kept neat, and especially that my desk is left for *my use only.*
B. You will renounce all personal relations with me insofar as they are not completely necessary for social reasons. Specifically, you will forego
    1. my sitting at home with you;
    2. my going out or traveling with you.
C. You will obey the following points in your relations with me
    1. you will not expect any intimacy from me, nor will you reproach me in any way;
    2. you will stop talking to me if I request it;
    3. you will leave my bedroom or study immediately without protest if I request it.
D. You will undertake not to belittle me in front of our children, either through words or behavior. (qtd. in Isaacson 185-186)

Had Mileva come too close to Einstein's male domain? The letter of separation, written in a stilted, authoritative manner suggesting the Prussian military lines Einstein saw marching past his house as a child, firstly expresses the desire for maternal care of his environment. He wishes for her to make sure his clothes are clean, his meals are regularly served and his bedroom is kept in good order. He also emphasizes that his study desk should be "for my use only," as if her sharing of it for her own work had been a point of contention. In the last section of the letter, he demands that she "stop talking" and leave him immediately if he requests, showing his impatience, by then, for her words.

Had Mileva expressed "too much"? Was her dark intellectuality, her ability to talk in the terms of Einstein's scientific world, too disconcerting to him as a man? Even while they were together, a teasing letter from Elsa about how he was a henpecked husband elicited the emphatic response, "Do not think about me in such a way! I categorically assure you that I consider myself a full-fledged male. Perhaps I will sometime have the opportunity to prove it to you" (qtd. in Isaacson 173). After Einstein's marriage to Elsa in 1919, which he called a "formality," he would

later tell a friend, "I am glad that my wife knows nothing about the sciences. My first one did, you know…" ("To Heinrich Zangger, 1 March 1916," CPAE 10:22; Chiu 47). Later on, when Mileva was preparing to write her memoirs in October 1925, Einstein wrote her that "One should be nice and modest and keep one's mouth shut, that is my advice to you." Despite Mileva being educated and well-written—or, perhaps, because of it—silences were even more silenced in the Einstein's married life than in that of the Joyces, where Nora's silence was instead met with Joyce's overenthusiasm to write through her lack of words.

Einstein wrote Helene Savić, Mileva's friend, an introspective letter in September 1916 on their separation that shows the role that silence played in it:

> Separation from Mitsa was for me a question of life. Our life in common had become impossible, even depressing, but I could not say *why*. So I am giving up my boys, whom I love so tenderly. During the two years of our separation, I have seen them twice; last spring I took a little trip with Albert. To my great sorrow I have found that my children do not understand my actions, that they feel a mute anger against me, and I find, although it hurts me, that it is better for them if their father does not see them any more. I shall be satisfied if they become useful and respected men; everything seems to indicate that they will because they are gifted, and although generally I do not hold very high the influence of education, I have great trust in the influence of their mother.
> ….
> Mitsa's illness has made me sad, but fortunately she is now in full convalescence. Despite this interest on my part, she *is* and *will remain* always for me a severed limb. I shall never again approach her; I shall finish my days far away from her, feeling that it is absolutely necessary. I believe that Mitsa sometimes suffers from too great a reserve; her parents and her sister, with whom she has always lived in good harmony, did not even know her address.
> …
> Do not feel sorry for me. Despite terrible appearances my life goes on in full harmony; I am entirely devoted to reflection. I resemble a farsighted man who is charmed by the vast horizon and whom the foreground bothers only when an opaque object prevents him from seeing. (Einstein- Marić, 109).

Even at the end, Einstein could not "say *why*" their marriage had fallen apart. He was a caring father and the separation from his only two children hurt him, but away from that painful, personal silence was the beckoning silence of the "vast horizon" that, to him, called to greater truths. He did not worry about Eduard's and Hans Albert's education because of his trust in Mileva as an intellectual, but he strongly emphasized that she was a "severed limb." It was a

mark of difference, perhaps between a writer and a scientist, that the writer sought to understand his closest relationship with a fever and fervor that never ended, while the scientist said he sought to "make the cosmos and its construction the pivot of [his] emotional life, in order to find peace and security which [he could not] find in the narrow whirlpool of personal experience" (qtd. in Isaacson 233). Mileva left with their children to Zurich, and Einstein stayed on in Berlin, where he was the director of the new physics institute and a professor at the University of Berlin.

But Einstein's actions make it clear that he did not divorce Mileva in order to return to a newfound relationship with his German motherland; his companionship with Elsa would always maintain a working distance, just as his return to Germany would be tinged with resignation and alienation (and he would eventually leave forever to teach in America at Princeton University). He had to accept his German citizenship again to take up the position at the University of Berlin, but his excitement of being at the center of the world of physics, surrounded by the likes of Max Planck, overcame his reluctance (180). However, as both World War I and his personal war at home began, Einstein was appalled at the way his former scientist allies jumped on the bandwagon of the German military effort. To his horror, Planck and other German intellectuals signed the "Manifesto of 93" that denied that Germany committed wrong in invading Belgium. They asserted that "were it not for German militarism, German culture would have been wiped off the face of the earth…We shall wage this fight to the very end as a cultured nation, a nation that holds the legacy of Goethe, Beethoven, and Kant no less sacred than hearth and home" (207). Einstein attempted to write a "Manifesto to the Europeans" in response with a Jewish friend, but none of his former colleagues or friends signed on (207). As if to compensate for the failings of his motherland, Einstein became member of a "New Fatherland League" to push for peace and a "United States of Europe." But the group was banned in early 1916.

All that kept him sane under these circumstances, as he wrote to Elsa, was the "love of science," which "thrives under these circumstances, for it lifts me impersonally from the vale of tears into peaceful spheres" (qtd. in Isaacson 183). Years later, commenting on his personal life,

he would write that he never felt close to anyone: "I gang my own gait and have never belonged to my country, my home, my friends or even my immediate family, with my whole heart. In the face of all these ties I have never lost an obstinate sense of detachment, of the need for solitude—a feeling which increases with the years" (*The World As I See It* 3).

Joyce, on the other hand, faced with the absence of words from Nora, never had the false impression that he could "diagnose" or understand her. She forever remained puzzling to him, just as Ireland would remain a simultaneous attraction and repulsion, a muse for all his novels and an enemy in his "war with convention" (*Critical Writings* 41). Undoubtedly, she was an inspiration for his art because of her sheer incomprehensibility: "It is perhaps in art, Nora dearest, that you and I will find a solace for our own love," he wrote during that period of silence in 1909. Einstein, however, could have felt that he knew everything about his wife from her letters and expressiveness—and he could diagnose her as a schizophrenic who reveled in the "split" nature of mathematics, as he put it (qtd. in Chiu 43). The silence of Lieserl, though, betrays a depth he never explored in Mileva, a depth she never could say (and what she did say in letters has been burned). Beyond Einstein's and Joyce's intimate relationships with the loves of their lives was a silence they could never reach—which served to lead them decisively away from union with Father God and their imposing mother(land)s toward a more creative way of speaking the silence through their disciplines of science and literature.

Second Movement

The Quanta of History

Concepts have their specific order in reality. They do not emerge out of human experience – if they did, they would be well made. The first appellations arise out of words themselves, they are instruments for delineating things. Hence every science remains in darkness for a long time, entangled in language.

-Jacques Lacan ***(Seminar I 2)***

Throughout "Telemachus," the first episode of *Ulysses,* James Joyce's autobiographical incarnation Stephen Dedalus finds himself unable to escape memories and images of his dead mother. After a sarcastic comparison his friend Malachi "Buck" Mulligan makes between the "snotgreen sea" and "our sweet great mother" Ireland (5), Stephen associates the color "snotgreen" with a porcelain bowl of "green sluggish bile" that his mother had vomited during her days of illness (6). Memories of her flood his thought world as he imagines her "shapely fingernails reddened by the blood of squashed lice from the children's shirts" (10). The root cause of his melancholy on this particular day, we learn, is that he had a dream the night before in which she had appeared, wearing "loose brown graveclothes" (5) and saying "mute secret words" (10)—the meaning of which he is unable to figure in the language of his thoughts.

As Stephen grieves in his thought world, words from outside also reveal his hurt: Mulligan chides Stephen that he never knelt to pray at the foot of his mother's deathbed (as Joyce also did not do). When Stephen tells Mulligan that he holds a grudge against him for calling his mother "beastly dead," Mulligan, a medical student, uses scientific language to defend himself:

he tells Stephen that she was just another dead body to him, like the ones he cuts "into tripes in the dissecting room," and regardless, when he had made the comment, her "cerebral lobes" were not functioning (8). The way Mulligan slices Stephen's mother into medical language makes Stephen feel "gaping wounds which the words had left in his heart" (8). Already, we can see how the assumption of his mother into a biopsy of medical language and discourse reveals "wounds," holes, inside Stephen—who, as we come to find out, fears "those big words…which make us so unhappy" (31).

An opus Joyce wrote over eight years, *Ulysses* calls upon myriad sources—Greek myth, philosophy, music, the history of the English language, Eastern philosophy, Irish lore and Christianity, to name a few—to tell the story of Dublin on June 16, 1904 through the eyes of Leopold Bloom, Stephen Dedalus and Molly Bloom. But perhaps Joyce's most celebrated contribution to the novel form was his use of "stream-of-consciousness" writing to immerse readers in the thought-worlds of his characters as we follow them throughout the day. As long as we are reading, involved in the characters' thought-worlds, we experience sensory stimulation from the outside (conversations, smells, music) that evoke thoughts and memories in their consciousness, as well as emotions from their "insides" that well up, unprovoked and jarring to the character and reader (10).

Yet as thoughts must be formed into words for us to read them, the language in which Stephen is able to think is still inadequate to express the "mute secret words" of his mother, the ineffable emotions caused by his dream (10). Later, as he teaches history in the 'Nestor' episode, he ponders who but a mother could have loved as sickly and dull a child as his history student, Sargent. As he attempts to help the student learn algebra, the "symbols" on the page recall the dead, a "mummery of letters." Only then, after seeing the entombed signs on the page does he find himself conceptualizing and crystallizing the ineffable feeling he felt earlier as "Amor matris," the Latin words for "motherly love" (28). "Was that then real? The only true thing in life?" he wonders.

In one of the earliest essays Joyce wrote while in a matriculation course at University College Dublin, he writes, "Vergil's Latin is said to be so idiomatic as to defy translation" (*Critical Writings* 30). Even as a concept, "Amor matris" is "subjective and objective genitive," Stephen immediately realizes—meaning that it could signify either "[another]'s love for the mother or the mother's love for [another]" (Johnson, "Explanatory Notes" 778). Here, we can see his dissatisfaction that concepts must be theorized in discrete packets of symbolic information that can't possibly represent the Real of what he is actually feeling. That which was inexpressible in the "mute secret words" remains unexpressed; "Amor matris" is merely a semblance, a silhouette of what we as readers can never know—the Real of Stephen's experience.

Just as Joyce describes how medical discourse and Latin cuts up Stephen's mother in his mind, so Jacques Lacan figures a scientific discourse such as geometry as a study that dissects reality at its pleasure—something Einstein also saw, fifty or so years before Lacan. In Lacan's first seminar, which he held open to the public from 1953-1954 at Sainte-Anne Hospital in Paris, he said:

> The odd thing is that an entire system of metaphysics has been founded on geometry and mechanics, by looking to them for models of understanding, but up to now it doesn't seem as though optics has been exploited as much as it could have been. Yet it should lend itself to a few dreams, this strange science which sets itself to produce, by means of apparatuses, that peculiar thing called *images,* in contrast to other sciences, which import into nature a cutting up, a dissection, an anatomy" (*Seminar I*, 76).

To Lacan, optics seemed to acknowledge that its study is of "images" that can be imaginary, like a many-colored rainbow we see from afar that is actually composed of water droplets. Sciences such as geometry, however, found itself on rigid measuring instruments and coordinate systems that seem to replace the experience of reality itself. Einstein also explored the same "rigid" aspects of geometry, which we will discuss at length later. Both Lacan's and Einstein's fascination with the study of optics, the way light travels, shows a shared belief that light "lit" the way into reality more than any other substance.

In his first seminar, Lacan describes his entire theoretical framework of consciousness around a central thought experiment related to optics and a series of case studies of patients. Lacan knew that concave mirrors, as opposed to convex or plane mirrors, have the special property of being able to create "real" images, which appear to be in front of the mirror, as opposed to purely "virtual" images, which we see beyond the mirror. In a normal, plane bathroom mirror, we see ourselves in an extension of the room we are standing in, somewhere behind the mirror. However, if we are in a certain position in front of a concave mirror, and the reflected light rays of an object (also in front of the mirror) reflect off the mirror and converge before meeting our eye, we will see the object as a mirage, as if it were *in front of* the mirror (Fig. 1) and flipped horizontally over the principal axis (the line that passes through the center of curvature and the focal point of the mirror). Lacan found this idea fascinating, and created a series of thought experiments playing with the ideas of "real" and "virtual.

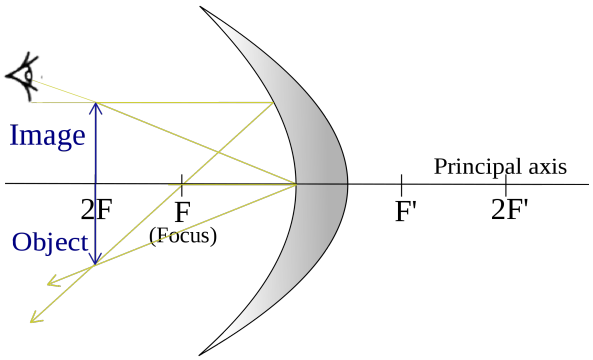

Fig. 1: Light rays reflect off the object hanging down and become reflected by the concave mirror as an upright, real image. From Wikimedia Commons, adapted by Ramachandran.

Using these ideas, Lacan came up with a thought experiment that sought to describe the human condition (Fig. 2). We 1) can see our eye as the subject reflected in a plane mirror placed beyond a stand, 2) are standing in between a concave mirror behind us and a stand in front of us that has 3) a bouquet of flowers on top of it and an inverted vase underneath (139-140). Our eye, however, is only looking at the final image created in the plane mirror by the whole figuration. Lacan explains that the light reflects off the inverted vase (which we do not notice) and onto the concave mirror behind us, producing a real image (in the definition of "real" formulated in optics) of the vase directly atop the stand. The resulting image—of both the tangible bouquet and a

mirage of a vase—is reflected in the plane mirror as an upright, virtual image of a full flower vase in an extension of the room beyond the mirror. That upright, whole image is the one our eye, as the subject, perceives. Lacan's point is that inside this "cone," or space of limited possibility that constitutes our subject position, "in being placed at a point very close to the real image, one is nevertheless capable of seeing it, in a mirror, as a virtual image. That is what happens in man" (*Seminar I* 140). We could just look down and see the real state: a hanging "sad, empty pot," or "some lonesome flowers" atop the table, but in the process of looking in the plane mirror *to see ourselves*, we see a complete and whole image of a bouquet of flowers in a vase (80). Virtual reality thus becomes our perceptive reality in this "cone" (139).

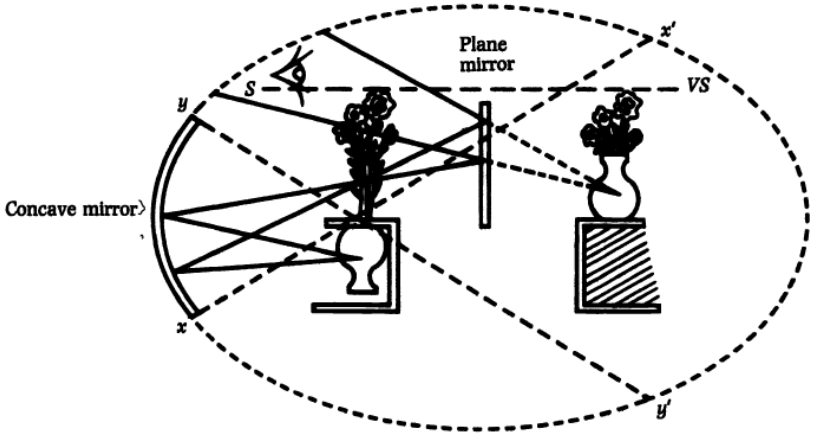

Fig. 2: The subject position, situated in between the concave and plane mirrors. From Jacques Lacan et al., *The Seminar of Jacques Lacan*, Book 1 (New York, W.W. Norton, 1991) 124. Print.

Lacan used this thought experiment to demonstrate his theory that each human's consciousness is composed of a balance between three "orders": the Real, the Imaginary, and the Symbolic[7]. In every action and interaction, such as simply looking into a mirror, one can find elements of all three orders working (*Seminar I*, 112-113). The Real describes the unutterable that eludes expression, such as the "mute secret words" of Stephen's dead mother and the hanging object underneath the stand that is beyond our subjective perception. During our infancy, before our ascension into language, Lacan says that the Real comprises our consciousness. As a state

[7] I owe the majority of my base knowledge about Lacanian theory to the clear expositions written by the eminent Lacanian scholars Bruce Fink (1995), Anika Lemaire (1997), and Sean Homer (2005).

prior to language or societal laws, the Real "is without fissure" and can "only be inscribed on the basis of an impasse of formalization" (*Seminar II* 2).

The Real becomes processed in our consciousness through the workings of the Imaginary order. The Imaginary encompasses our mental processing of social relations, which give us false ideas of what is real based on the images we perceive—such as our own likeness in the mirror, the "wholeness" of which gives man "imaginary mastery over his body," and the reflected image of the flowers and mirage-vase, which we mistake for real (*Seminar I* 79). The Freudian ego arises in our Imaginary order, working to conjure up the false image of our own wholeness associated with the signifier "I" in direct contrast to the Real, which Lacan described as infinite and outside of the limiting boundaries of "wholes."

The Symbolic order, also variously called the Name of the Father, the mOther, or the Big Other, consists of language and discourse, which includes social laws such as marriage that constitutively shape our subjectivity. In the inverted bouquet thought experiment, the "cone" between the concave mirror and the stand is the symbolic order, encompassing and creating our subject position. In Stephen's world, Buck Mulligan's medical discourse and the Latin language are the symbolic order that at once give voice to the Real, but in an entombed, cut-up way that fails to fully signify what Stephen feels.

For a first-timer to Lacan's theories, these ideas might seem rather arbitrary: how can one generalize an individual's existence to these three orders? How does dividing consciousness up into these categories help us? In fact, it is not only Lacanian psychoanalysis that creates categories at the outset of analysis in order to guide analysts and analysands—but also, as Einstein noted throughout his life, the entire discipline of physics. For the volume *Albert Einstein, Philosopher-Scientist* (compiled and published shortly before his death), the veteran physicist and his contemporaries wrote essays discussing his contributions to physics and his conceptual battles with quantum mechanics (which we will examine in great detail). At the outset of his "Remarks to the Essays Appearing in This Collective Volume," Einstein begins with a confession: that he

must make the "metaphysical 'original sin'" for the sake of science and create an arbitrary distinction between "sense-impressions" and "mere ideas" (673)—both of which are "categories" that make the "totality of the contents of consciousness 'intelligible'" (673). Without these distinctions, he writes, we would be "breathing in a vacuum," reduced to solipsism (the idea that the self can be the only thing we know to exist) and unable to distinguish between subjectivity and objectivity. He proposes that we consider the term *objectivity* to denote "the totality of…concepts and conceptual relations as are thought of as independent of experience, viz., of perceptions." Once we recognize that we are inside such a "sphere of thought," governed by these initial rules, we are allowed to call our perceptions "physically real" (674). Einstein's purpose in establishing these distinctions is to set up a basis for retaining objectivity in physics despite such limiting ideas as Heisenberg's Uncertainty Principle, which showed the impossibility of measuring both the momentum and position of a particle at the same time without altering the measurement through the very act of observation.

While we will examine the rest of Einstein's argument in due course, the point I want to make now is that knowledge systems require conventions and foundations and categories which can lack, as Einstein admits, any "logical-philosophical justification"; they merely help us establish a "program" of knowledge to inform our world. His use of the word "program" implies the same sort of self-consciousness that Lacan had in establishing his "orders." Not unlike computer programs or artificial realities, these programs have the quality that one can become lost in them. Einstein therefore emphasizes that we are by no means "forced to cling a priori" to these programs, which are simply "free categories," as opposed to the rigid categories of thought proposed by the 18th-century German philosopher Immanuel Kant. Correspondingly, Lacan always emphasized in his seminars that "all that counts...is the way the figurations are put to use," not the actual terms and correspondences themselves (*Seminar I* 145). Despite the dissecting nature of these categories and conventions, like Buck Mulligan's medical language, these three thinkers understood that we are forced to live within the "programs" of knowledge, the tectonic

plates. But as investigators of the Real, they also understood that they must ever question the bodies they stood upon.

In light of these bodies of discourse based on obvious assumptions, we come to the question of their fundamental components, fact. What is fact? We have seen the way in which continuous streams of Real emotion, such as Stephen's feelings for his mother, can most easily be expressed through the Symbolic order of discourses that situate his subjective position. Though Stephen resists the "mummery" of the letters, he finds himself unable to express his mother's love otherwise. Between his concave mirror and bouquet, he can only figure the idea as "Amor matris." In this way, "fact" seems to be composed of concrete concepts and data that, paradoxically, stem from a seemingly continuous flow of knowledge and Real experience.

The quantum was one such phantom fact that seemed at first to be a fiction but slowly, with time, grew real and set forth a revolution in twentieth-century physics that physicists are still puzzling over today.

By the time Einstein started his serious scientific study late in the 19th century, the physics community at large had considered light a wave and only a wave for the better part of the century. Sir Isaac Newton's theory that light was corpuscular, or composed of "very small Bodies emitted from shining Substances," was deemed incorrect by the early nineteenth century by the likes of Thomas Young, an English physician and physicist, and Augustin Fresnel, a French civil engineer fifteen years his junior (from *Opticks*, 1704: qtd. in Kumar 52). Young and Fresnel independently devised experiments showing that light directed through two slits at a screen produced bands of light and dark interference, which would have been impossible under Newton's particle theory (because particles of light would have traveled in straight lines and created two bright bands of light behind the slits). After James Clerk Maxwell, a Scottish theoretical physicist, revolutionized physics by demonstrating that electric and magnetic phenomena are components of the same underlying "electromagnetism," the world of science

came to perceive light as an electromagnetic wave, propagating itself transversely through space via a mysterious medium called "luminiferous ether."

But there were still many problems inherent in the wave theory of light, the medium of ether being merely one of them. Classical physics could not explain part of the phenomenon of how hot bodies radiated light. While measurements showed that hot bodies emit a range of visible and invisible electromagnetic waves, with hotter objects shifted to the blue end of the spectrum as a result of some relationship between wavelength (color), temperature, and intensity (brightness), the equations at hand seemed to break down in the case of calculating the way energy was distributed over a range of electromagnetic waves present in a hypothetical closed hot box called a blackbody. As the box was heated, the electromagnetic radiation emitted from a tiny hole would change color from red to blue-white-hot—and physicists could calculate how much energy would be emitted at longer wavelengths of red and infrared light. However, at the shortest wavelengths, the equations predicted that the blackbody, composed of oscillating atoms that created electromagnetic radiation, seemed to emit infinite energy. This problem came to be known as the "ultraviolet catastrophe" (Perkowitz 79). But in 1900, German physicist Max Planck, who had toyed with the idea of becoming a professional pianist instead of a physicist during his late teens, provided the piece of the puzzle that would prevent the catastrophe and revolutionize physics: the quantum (Kumar 1-31).

Planck proposed that the oscillating atoms composing the blackbody must emit and absorb radiation in specific packets of energy called quanta, proportional to the frequency at which the atoms oscillated. These quanta would be calculated as an exact multiple of a tiny constant he measured through experiment (which would later be called "Planck's constant," represented in equations by *h)*. Because shorter-wavelength ultraviolet waves would accordingly require a prohibitively high amount of energy to be emitted by the atoms, those highest-frequency waves would never happen, averting the catastrophe. While Planck's solution checked out experimentally, his quantization of energy was radical: that atoms can only absorb and emit light

in specific multiples of an energy constant is equivalent to imagining that one can only drink milk in whole number multiples of cups, without any half- or quarter- cups allowed (Perkowitz 79-82).

As science historian Manjit Kumar notes, it's unclear whether Planck knew at the time that he had just revolutionized physics. The irony of Planck's theorization of the quantum was that he did not believe it to be an actual particle that composed electromagnetic waves. He only conceived of quanta as the finite energy amounts that the atom-oscillators could emit or absorb at once—and did not extend the description to encompass the consistency of light. "This was a purely formal assumption and I really did not give it much thought," he wrote in 1931 to American physicist Robert Wood (qtd. in Kragh 62).

For a long time, Planck had rejected even the atomic theory of matter, writing in 1882 that "ultimately it will have to be abandoned in favour of the assumption of continuous matter" (qtd. in Kumar 21). But as he was conceiving of the hypothetical blackbody, he realized he had to accept atoms. While an oscillator's frequency is fixed, the amount of energy it could emit or absorb at any one oscillation depends on the amplitude of its oscillation—which is variable and dependent on probability (Ansari). Planck had to resort to thinking of his oscillators in terms of the atoms of statistical mechanics in order to calculate the most probable distribution of certain quantum values among them that would figure the right distribution of radiation emitted by the blackbody. Truth be told, he did not like the idea of proposing fictional entities purely for the sake of making an equation or theory work out: years later, a former student and colleague of his, James Franck, called him a "revolutionary against his own will" (qtd. in Kumar 29). Contrary to Planck's dismissal, the quantum and the atom were found to be quite real, largely due to the work of a certain patent clerk in Bern, Switzerland.

Einstein had always been a believer in atomic theory, and it had never felt right to him that Maxwell's laws presumed light to be a continuous wave, while "gases and other ponderable bodies" seemed to be composed of tiny particles ("On a Heuristic Point of View Concerning the Production and Transformation of Light" 177). While heat radiation was known to arrange itself

in equilibrium of probable distribution, based on statistical mechanics, the same was apparently not true for electromagnetic radiation. Einstein's idea of light quanta came about through his exploring and re-deriving of Planck's law of blackbody radiation. He theorized a sister thought experiment to the original blackbody: what if the blackbody were filled with gas particles and electrons that zoomed around as the body heated up? Using established laws for calculating the relationship between wavelength and temperature and for calculating the entropy of gas, Einstein derived an equation for the radiation of the blackbody that looked very similar to the one describing "how the entropy of a gas, *made up of atoms*, is dependent on the volume it occupies" (Einstein, CPAE 2: 97; my italics). In his 1905 paper "Concerning an Heuristic Point of View Toward the Emission and Transformation of Light," Einstein proposed that blackbody radiation—light—behaved similarly to gases and seemed to be made up of discrete bits of energy. The idea that light was corpuscular and was constituted by "energy quanta"—was radical (178).

However, it did explain a certain effect of light, first studied by Heinrich Hertz and Philipp Lenard at the turn of the century. When a high-frequency light was directed onto a metal plate in a vacuum chamber, the ultraviolet light seemed to dislodge some electrons from the plate and cause them to flow as an electric current across a gap of space to land onto a second metal plate placed slightly further away. Einstein's light quanta explained why increasing the intensity of the beam (using a brighter light beam) corresponded to a greater number of electrons being released from the metal plate, while a higher frequency of light (at the blue end of the spectrum) caused the electrons to be released with greater energy. With greater intensity of the light beam came a larger number of photons, which could take out more electrons, and using a higher frequency meant that each individual quantum would have greater energy with which to knock an electron out of the metal. Einstein's discovery also explained why under a minimum "threshold frequency" of light, no electrons would be emitted, regardless of the light or the time it was shone on the metal (Kumar 50).

For a long time, Einstein's colleagues in physics did not accept the wave-particle nature of light. Though Planck accepted the revolutionary nature of Einstein's special theory of relativity, which we will examine later, he felt that the light-quanta hypothesis went too far. When Planck along with three others nominated Einstein to the Prussian Academy of Sciences in 1913, they excused his heresy by saying that "he might sometimes have overshot the target in his speculations, as for example in his light-quantum hypothesis, [but it] should not be counted against him too much. Because without taking a risk from time to time it is impossible, even in the most exact natural science, to introduce real innovations" (qtd. in Kumar 52).

However, soon enough, the light-quantum, later called the photon, became real. The model of the atom created by Danish physicist Niels Bohr used quantum jumps between energy levels to explain why hydrogen gas, when hot, emitted a certain spectrum of light colors. Arthur Compton's experiment in 1923 at Washington University, St. Louis showed that X-rays lost energy after illuminating electrons, because some photons transferred energy over to the electrons. Louis de Broglie would carry forward the concept of wave-particle duality to matter like electron particles, and Ernest Schrödinger would create the wave equation that theorized that particles only materialize out of waves of probability as a result of our acts of observation. All of the events that transpired after Einstein's 1905 paper seemed to echo the prophetic and radical statement he made in a 1909 keynote lecture in Salzburg for a conference of the *Gesellschaft Deutscher Naturforscher und Ärzte* (Society of German Scientists and Physicians): "The next stage in the development of theoretical physics will bring us a theory of light that may be conceived of as a sort of fusion of the wave and of the emission theory of light" (CPAE 2: 563).

Wave-particle duality became a reality, as light could be observed either as massless energy packets called photons or as a continuous flow of radiation. Of the five papers Einstein published in 1905 on topics from special relativity to Brownian motion, the only one he described as "revolutionary" was the one on light quanta (CPAE 2: 134). The quantum became the cornerstone of the composition of waves and matter—and yet, as a packet of energy, it was hard

to conceive of as a "particle." As Heisenberg said, "we must realize our words don't fit" when it comes to the quantum. The only way to explain it was through mathematical formalism—new signs to represent new concepts. "A new mathematical scheme is just as good as anything because the new mathematical scheme then tells what may be there and what may not be there," Heisenberg wrote, referring to the probabilistic nature of the wave equation (qtd. in Kumar 244). In experiment, either we can see light as a photon emitted by a metal, or we can see it as a continuous ray traveling through slits—but it is still impossible to see both characteristics at once. Despite the ambiguity of the essence of these quantized particles, the quantum, as a word and a symbolic entity, remains the most easily recognizable fact and advancement of new physics.

I raise the ideas of the quantum and wave-particle duality to align the ways Lacan, Einstein and Joyce viewed the notion of the "concept." Beyond the distinction and discreteness implied by the word "quantum," there lies a whole realm of ambiguity, amorphousness, imagination and questions that have preoccupied the study of physics since the early twentieth century. There is the reality that waves and particles are neither one nor the other. Some, like Bohr, might say that only one or the other interpretation can exist at any one time depending on our measuring apparatus, and others like Einstein might say that they are both at the same time, an "indeterminacy-made-duality" due to our observations and methods of study (I call it "indeterminacy" because calling it "oneness" occludes the aspects of duality). Or, as Seamus Heaney put it: "Outside of the hermetically sealed world of the archive are the boglands…where facts refuse to keep their shape" (qtd. in Orr 74). In Lacanian terms, the Real lies beyond the distinctions and cuts made by the Symbolic language and discourse. However, these distinctions and conventions form the basis of "programs" of knowledge and "orders" of existence. Correspondingly, when light is directed upon these bodies, what is emitted is indeed a photon of fact that appears discrete. As per Einstein's interpretation, the quantum is the discrete incarnation of an indeterminate element that is also continuous, just as the historical fact, or the "Amor

Matris," is the discrete symbolic photon that is emitted from an underlying "bogland" of infinite "mute secret words."

That's not to say, however, that the quantized light particle, the photon, is not real: it is simply as real as continuous light—and more real for the purposes of understanding subatomic interactions than a continuous energy force. Lacan admired the importance given to atomism in science because it shows that the "hypothesis of a pre-established harmony" is not nearly as fruitful as these other approaches that "place symbolism in the foreground." "It is simply symbolism which they bring into operation inside the real, not by virtue of projection, nor as a framework of thought, but by virtue of being an instrument of investigation," he says in Seminar II (98). In other words, the foregrounding of the symbolic—which Planck accomplished, even while believing the quantum to be a complete fiction—allows for fissures to be magnified in our very "instruments of investigation," our measuring apparatuses, which were holes that Einstein saw as areas for further research. As Max Born, one of Einstein's closest friends and colleagues once said, Einstein had "the gift of seeing meaning behind inconspicuous, well-known facts which had escaped everyone else…It was this uncanny insight into the working of nature which distinguished him from all of us, not his mathematical skill" (qtd. in Kumar 45).

These very "inconspicuous, well-known facts" that Einstein relentlessly investigated trouble Stephen deeply throughout the course of *Ulysses*. In 'Nestor,' he goes to collect pay from Mr. Deasy, the principal of the school where he teaches, and has to endure Mr. Deasy's paternalistic rants. As a Tory, a Protestant loyal to the English crown, Mr. Deasy touts his lineage as "all kings' sons" and tells Stephen that history is teleological, always moving toward "one great goal, the manifestation of God" (34). But for Stephen, real history is in the ineffable of the Real. Real history is not symbolic, like the "snotgreen sea" Buck Mulligan saw to represent Mother Ireland; it is the milk woman who visits them, "a wandering crone" with "old shrunken paps" who does not know a word of Gaelic and cannot understand the Irish language when Haines, an Englishman, speaks it to her (14). Rather than the one "great goal," Stephen finds

history composed of the erratic "goals" scored by the schoolboys outside, where "Time shocked rebounds, shock by shock" (32). The chaff cast off in formulating history as "one great goal," to Stephen, is the fact that the "shout in the street"—"Hooray ! Ay ! Whrrwhee !—is left out of the archive. To Stephen, the facts of history that Deasy reels off—that "a woman brought sin into the world," a "faithless wife first brought the strangers to shore here," and "a woman too brought Parnell[8] low"—are too dictated, too hard and unchangeable (34). We see the rejection of this viewpoint in Stephen's argument in 'Aeolus' that literary critics need to pay increased attention to Anne Hathaway's importance in Shakespeare's life and work. John Eglinton asks "Do you mean to fly in the face of the tradition of three centuries?" and Stephen answers, "She saw him into and out of the world." (182). A Real understanding of history, to Stephen, means an inquiry into the gaps, holes and lapses, the cast-offs like the old milk woman, the "mute secret words" of his ghostly mother. Yet as we saw with his struggle to communicate Amor matris, Stephen is also aware that the ineffable, to enter into thought and theory, must be crystallized into symbolic language, hardened into a concept. That is why Stephen perceives history as "a nightmare from which I am trying to awake." It propels itself through the "mummery of letters" and facts of the symbolic law, passed down in schools like the one where Stephen teaches. As Joycean critic Robert Spoo notes, the teleological, structured history of Mr. Deasy does not see historical discourse as Stephen does: "suspended midway between truth and falsity" (133).

Reality vs. reality

What morphing and shaping "indeterminacy" lies beneath the emitted quanta of discourse? Einstein called it "wonder"; Joyce called it "drama"; and Lacan, as we noted earlier, calls it the "Real."

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[8] Charles Stewart Parnell was the charismatic, 19th-century Irish revolutionary who galvanized his countrymen to clamor for Home Rule. He fell out of political favor, however, after his affair with another man's wife came to light. (See Johnson, "Explanatory Notes" 781)

For Einstein, consciousness exists on three planes: "wonder," the "thought world," and the "world of concepts":

> For me it is not dubious that our thinking goes on for the most part without use of signs (words) and beyond that to a considerable degree unconsciously. For how, otherwise, should it happen that sometimes we "wonder" quite spontaneously about some experience? This "wondering" seems to occur when an experience comes into conflict with a world of concepts which is already sufficiently fixed in us. Whenever such a conflict is experienced hard and intensively it reacts back upon our thought world in a decisive way. The development of this thought world is in a certain sense a continuous flight from "wonder." ("Autobiographical Notes" 9)

Einstein's three planes seem to coincide almost exactly with Lacan's orders. "Wonder," as the ineffable and unrepresented Real, seems to rise to the level of consciousness only through an experience that "comes into conflict" with the "world of concepts" which, as Lacan would corroborate, is "already sufficiently fixed in us." Correspondingly, the "world of concepts" is the Symbolic order, which doubles as the Lacanian unconscious that Lacan often said is "structured like language"(qtd. in Fink 8). Einstein's vision of the Imaginary is the "thought world," which acts as the mediator between the Real and Symbolic by developing ways to deal with these "conflicts." As Lacan's concave mirror experiment showed, the Imaginary's limited perceptive ability is based upon images of wholes. Thus, as Einstein writes, the "thought world" is always in a "continuous flight" from the Real of "wonder," ever missing the point.

Yet there are some fundamental differences between Einstein's and Lacan's versions of the Imaginary. For Lacan, no thought goes on without words once we are ushered into the Symbolic order of language. Yet Einstein writes that his most productive thinking goes on without the use of words, in terms of "memory-pictures." Whenever a certain picture comes up in many different series of memory-pictures, it becomes an "organizing element" that evolves into an "instrument" through which he can comprehend patterns. Such an instrument becomes a "concept" at the moment when "free association" between these pictures turns into "thinking" ("Autobiographical Notes" 7). Here, we can see that the scientist does not rely solely on language for accessing or communicating new ideas. Images as well as mathematical signs,

which symbolize the experience of cosmological phenomena with mere letters, allow the scientist areas to slip underneath language as long as they can bypass the discourse of scientific language, which Einstein saw classical mechanics asserting in the form of absolute time and absolute space, as we shall explore later.

Despite this difference, we can see that something resembling Lacan's formulation of a "false whole" does appear in Einstein's idea of the "thought world" too. In a letter to the mathematician Jacques Hadamard, Einstein elaborated that there is "the desire to arrive finally at logically connected concepts" while thinking. However, he goes on to say that this desire does not clash with the "vague…combinatory play" that "seems to be the essential feature in productive thought" (qtd. in Ghiselin 32). Furthermore, his thought process seems to make no pretensions toward understanding a "truth" through these concepts abstracted from memory-pictures. "Truth," he writes, just like "objectivity," can only be accessed when there are already conventions and rules set for the game—at which point there can be truth found within those particular games ("Autobiographical Notes" 8-9). His statement clarifies for us what Lacan might mean by "false whole" (*Seminar XX* 85). Wherever truth appears as an ideal, there is already a fundamental, built-in flaw, because truth only ever arises out of out of a system of conventions. Einstein's self-conscious ability to analyze his "thought world" as one affected by desires toward teleological concepts—yet one also founded on systems of convention—will prove useful as we discuss his method of dealing with the oppressive elements constituting classical scientific discourse.

For Joyce, the Real was Drama. The differences between Joyce's and Einstein's approaches to the topic are visible at the outset: while Einstein emphasized the structure of scientific language and the cracks in this structure—in ways that approximate the Lacanian Symbolic order—Joyce's approach was to deal directly with his conception of the Real. "Drama and Life" was one of Joyce's earliest essays and, fittingly, one of his first experiences with censorship, as the president of University College, Dublin tried to stop him from reading the

paper in front of the college's Literary and Historical Society (Joyce, *Critical Writings* 38). Just as Lacan's Real is a pre-linguistic, pre-Imaginary, formless infinite[9], so Joyce's drama seems to come into existence at a pre-societal point, "coeval" with the moment we come into being (Joyce, *Critical Writings* 43).

> By drama I understand the interplay of passions to portray truth; drama is strife, evolution, movement in whatever way unfolded; it exists, before it takes form, independently; it is conditioned but not controlled by its scene. It might be said fantastically that as soon as men and women began life in the world there was above them and about them, a spirit, of which they were dimly conscious, which they would have had sojourn in their midst in deeper intimacy and for whose truth they became seekers in after times, longing to lay hands upon it… (*Critical Writings*, "Drama and Life" 41)

Drama is thus formless, infinite in its movement and not confinable to a signifying scene, just like Lacan's Real. Though the "spirit" that Joyce personifies as drama seems to exist outside of men and women—unlike the Lacanian Real, which is tied both to a deeper internal and external level—the "sojourn" Joyce describes toward a "deeper intimacy" with drama seems to form the crux of society's search for "truth." However, unlike Lacan's Real and Einstein's "wonder," drama can be captured in forms that allow for its expression—although, as Joyce shows in the essay, many forms of drama such as Greek drama were "wrought in gold, but not upon lasting pillars," ornate in structure but susceptible to decay as a very result of their expression as form (39). The young Joyce finds the "highest forms" of drama in the works of Henrik Ibsen, the Norwegian playwright known as the "father of realism" in theater: the drama in his play "The Wild Duck," Joyce writes, is "so unswayed, so unchallengeable a nature" that "one can only brood upon it as upon a personal woe" (42). In the deepest expression of this ethereal, pre-societal drama, one cannot express it: it is ineffable, like Stephen's emotions about his mother, only comprehensible as a "personal woe" (42).

But for Einstein's pursuit—an encompassing language of science—truth could not simply check out with the unexpressed "wonder" or "personal woe." Science, as a discipline calls for

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[9] See Fink, *The Lacanian Subject*, 24-25 for similar descriptions of Lacan's Real.

agreement of ideas and generalizability. While the highest form of artistic expression for Joyce is a deeply personal understanding of a moment, inexpressible in words and only palpable as an innate understanding of the Real, the highest form of scientific expression for Einstein is a few encompassing, unifying concepts that one can trace down to the lived, sensory experience—a theory of language he puts forth in his essay "Physics and Reality." It's useful for us to study Einstein's construction of scientific language to see how "wonder" relates to those emitted "quanta" of concepts from the discipline of science.

When Einstein was growing up, he loved to build houses of cards and construct "complex structures" with his toy building set (Isaacson 12). Balancing one flimsy card on top of another, he would stack his buildings as high as fourteen stories, according to his younger sister Maja. He would later evoke the metaphor of a "great building of science" to describe how scientific language evolves, given a set of rules, to create a logically cohesive "totality…of connections" with layers of concepts built one on top of the other (19). In his system, *primary concepts* are those ideas intuitively connected to lived, sensory experience, and they form the foundation of this building. As we have seen before, Einstein rejects the Lacanian idea that these words are built on language itself, from the descriptions available in the discourses into which we are born. "The differentiation between sense impressions and representations is not possible," out of the scope of Einstein's commentary on language because it is one of the "rules" we accept at the outset.

Einstein goes on to say that a "scientifically minded" spirit cannot simply be content with the primary concepts, as they lack "logical unity" (20). They are fragmented representations of sensory experiences without any conceptual order or pattern. So the scientist "invents" a "secondary system" of concepts that pulls the primary concepts together in a semblance of unity—but pays for this added coherence by creating new concepts that "are no longer connected with complexes of sense experiences" (20). So tertiary and quaternary layers are created, each consisting of abstractions of the previous layer for the sake of progressing toward the "greatest conceivable unity, and of the greatest poverty of concepts of the logical foundations, which are

still compatible with the observation made by our senses" (21). Science's key to understanding reality, for Einstein, is simplicity. The dream of scientific language would be a final layer that builds upon all these concepts—not by allowing for all of them, but by having a few cards at the top layer of the house that, when "reduced," would reveal their relationship to observable reality, the foundations of the building. These few theorems would be "logically deduced and belonging to a basis, as narrow as possible, of fundamental concepts and fundamental relations which themselves can be chosen freely" (21). Einstein is careful again to emphasize that the foundation is not absolute, but based on a convention of our choosing: namely, that "nature—as she is perceptible to our five senses—takes the character of such a well formulated puzzle" and "only *one* word…really solves the puzzle in all its forms" (21). The choice of that word (his analogous reference to the few unifying concepts at the top) is not, he says, akin to the "liberty of a writer of fiction," who might engage in any amount of word play. Rather, the scientist chooses his founding concepts as would the solver of a "well designed word puzzle" for which there exists a single best solution (21). But his analysis that writers of literature can choose any words or meanings fails to consider that writers too are restricted by the parameters of the puzzle, that one has to use already-existing words to solve it. As we noticed through Stephen's example, the constrictions of the Symbolic order trouble Joyce too.

Because Einstein thought in "memory pictures," he attributes the closest truth of reality not to foundational primary concepts, but to those images we form from sensory experience—a stance very close to that of a philosopher he greatly admired, Ernst Mach. Any abstracted theorem or concept only gained validity by being reducible, related to a foundational primary concept and an observed sensory experience. But this is where Einstein saw the shakiness of quantum mechanical concepts, like Heisenberg's Uncertainty Principle mentioned earlier. The intermediary layers of connection that support them are "problematic partial successes which support one another but which also threaten one another" because of "deep seated incongruities." New physics called into question sensory experience itself as a generalizable concept. At the

conclusion of his exposition of an ideal scientific language, Einstein backtracks and admits that he is "inclined to answer no" when considering whether the "great building which is science" he evokes at the outset could be constructed (62). This conflicted non-resolution is a theme throughout his writings, where we see a clash between an ideal construction and the unglued cracks inherent in the architecture of such a card-house. He wrote about this idea in his obituary on Mach. Concepts can "easily gain authority over us such that we forget their worldly origin and take them as immutably given. They are then rather rubber-stamped as a 'necessity of thought' and an 'a priori given,' etc. Such errors often make the path of scientific progress impassable for a long time" (qtd. in Norton, "How Hume and Mach Helped Einstein Find Special Relativity" 19). His effort throughout his scientific career was to question any such concept that reigned in a semblance of hegemony over thought.

Lacan formulated the struggle between the ideal and the "lacking" reality in psychoanalytic terms through his conception of the mirror stage, which he theorized as a fundamental step in the development of an infant, based on his studies of physiology and animal psychology. Because humans, as opposed to animals, can recognize themselves in the reflected images, Lacan was interested in exploring the role of this image in the development of our psyche (Zuern). He theorized that between six and 18 months, infants become fascinated with their own images in the mirror. The mirror gives the baby a false image of cohesion when, in fact, the infant does not yet quite have coordination over his/her arms and legs: his/her movements in real life are "fragmented" (*Ecrits* 4). What the infant *sees* in the mirror seems to be whole, complete, and unified; however, what the infant *feels* is his/her own lack of coordination and his/her fragmented limbs and body parts. Despite this recognition of difference between seeing and feeling, the infant cannot differentiate between the image outside of him/herself and the Real of his/her fragmented self. Confused, the infant feels alienation, because the image takes the place of the infant's "self" or "I." Coming into being itself is therefore defined by the loss of our Real identity to an

Imaginary illusion. The infant's unified idea of the self is actually another—the image in the mirror of the full bouquet of flowers, an ideal.

In that split-second of seeing oneself for the first time, as the infant struggles between its fragmented sense of self and the cohesive image before it, the infant's ego is born. The illusory sense of unity the infant feels after gazing upon its reflection is the same sense of cohesion that the ego seeks (but never finds) throughout the rest of the infant's life. As Lacan puts it, "The object [of desire] is always more or less structured as the image of the body of the subject. The reflection of the subject, its mirror stage, *is always found somewhere in every perceptual picture, and that is what gives it a quality, a special inertia*" (qtd. in Butler, *Bodies That Matter* 76; my italics). The physical mirror stage that the infant undergoes becomes generalized in his/her every new experience, as he/she ever will be in pursuit of wholes.

The difference between the fragmented Real and the fantasy of unity in the Imaginary is what Einstein formulates in his idea that the "thought world" is always in a flight away from "wonder." It is the same fantasy of unity that Einstein says leads to structures of concepts in the Symbolic order that are lacking in more and more ways as they aspire to a greater "unity" in their meaning.

Lacan further relates the false unity of perception borne from the mirror stage to the inability of the word to signify a concept fully. To bolster his idea of the Symbolic order's obscuring hegemony in constituting the eye's subject position in the concave mirror experiment, he draws from the structural linguistics pioneered by Ferdinand de Saussure, who first introduced the idea that signifiers (words, sounds, gestures) must emerge in concert with a signified in order for there to be meaning (and language is simply conventional—as these signs, like the word "shoe," are only meaningful due to arbitrary conventions). Lacan's contribution to this idea was that meaning always overflows and eludes a single signifier, and no single signifier is absolutely fixed—the relationship between signifier and signified is not absolute (Hook 63-64).

> The system of language, at whatever point you take hold of it, never results in an index finger directly indicating a point of reality; it's the whole of reality that is covered by the entire network of language. You can never say that this is what is being designated, for even were you to succeed you would never know what I am designating in this table – for example, the colour, the thickness, the table as object, or whatever else it might be…(*Seminar III* 32).

Similarly, Lacan conceptualized the analytical subject, the human, as a signifier, who engages in speech and writing that can call up any number of signifieds (which would give the psychoanalyst access to unconscious impulses). In describing the mirror stage, Lacan wants us to see that it is impossible to fully know what we might refer to as "I" in a sentence like "I washed my car"—one's ego, unconscious, body? There's always a bar between the signifier ("I") and the signified (an entity like the ego), because even the signified can only be described by other signifiers, resulting in an eternal slippage. There is always "something which is beyond each one of the elements which are articulated," Lacan says, which is the ineffable Real (*Seminar V* 8-10). Lacan argues that we are constituted not only by circuits of discourse of the Symbolic order, like Mr. Deasy's patriarchal history, but also by chains of signification, concepts that gain meaning from other concepts, which gain meaning from other concepts, etc. The fundamental alienation of coming into being that we feel in the mirror stage—a gap between an ideal image (the full bouquet of flowers in the vase) and the fragmented Reality of the empty vase and hanging bunch of flowers—is the same gap we see in language. Thus Lacan related our position as a subject in the symbolic order to that of a signifier in a sentence. Both are barred, unable to formulate the Real, forever in pursuit of Imaginary wholes and unable to break free from Symbolic language.

While Lacan's mirror stage may or may not be an actual stage in psychological development, as mentioned in the introduction, the metaphor it provides of a moment that forces us to make unified sense within language finds echoes in Einstein's and Joyce's writings. Comparable to Lacan's mirror, Einstein articulates that a "labyrinth of sense impressions" forces us to orient ourselves within the concepts we create, essentially assigning wholeness and permanence to ideas—as does the infant with his/her mirror image. "These notions and relations,

although free statements of our thoughts, appear to us as stronger and more unalterable than the individual sense experience itself," which could just as easily be "an illusion or hallucination," he writes ("Physics and Reality" 18). The awe of it all, to Einstein, is that these concepts we can create from our measly lived experiences actually provide the semblance of "comprehensibility" of reality. It is about our capacity to create this fiction that Einstein marvels and Lacan despairs.

Joyce, like Lacan, finds the image of an ideal troubling in "Drama and Life." Men and women who look to art as the "glass wherein they may see themselves idealized" necessarily miss the point. "Sorrowful blossoms" seldom emerge from the "outpoured blood of hapless heroism." Often, hapless heroism can be a bumbling, be-moustached Jewish man who farts and enjoys the tang of urine in his breakfast kidneys (Leopold Bloom in *Ulysses*). "Art is marred by such mistaken insistence on its religious, its moral, its beautiful, its idealizing tendencies," he writes (*Critical Writings* 44). Drama deals with a more essential reality by being ever "at war with convention." For all these thinkers, there is no approach to the Real without turmoil and conflict.

Third Movement

The Cracks in the 'Ramparts'

In *Ulysses*, after Stephen leaves his school and Mr. Deasy's overbearing presence, he walks along Sandymount Strand, a beach in Dublin, and ponders "the ineluctable modality of the visible world," the inescapability of sensory experiences for forming our impression of reality. While before, he felt that "history is a nightmare from which I am trying to awake," in 'Proteus,' we see the way in which absolute time and space also oppress Stephen as "Signatures of all things I am here to read." Can thought exist except for that which is "thought through my eyes"? While primary concepts close to sensory experience were closest to truth for Einstein, Stephen relates more to the Lacanian idea that everything he thinks must come from systems of languages, discourses of knowledge already laid in front of him to be "read" through his senses. Matter itself becomes a discourse. He thinks about Aristotle's theory that our sense of sight works by perceiving the color boundaries of bodies. But he wonders how Aristotle "was aware of them bodies before of them coloured" and then realizes: "By knocking his sconce against them" (37). Before Aristotle could form a theory of sight, he had to knock his head against physical bodies, which allowed him to define the idea of the body. Even matter is a discourse we cannot exit. No theory or idea seems to arise apart from the world that exists "there all the time without you"—language and matter outside of Stephen and independent of Stephen.

But something seems amiss in this ineluctability. While physical and linguistic signifiers, from the words of Thomas Aquinas and Irish bar songs to "the nearing tide" and a "rusty boot," clutter Stephen's thought world, the ideas to which he attaches *significance* point to his Real impulses. Stephen at first attributes little importance to his being there before the world to "read"

and "name" it. But as his thoughts form more coherence from his experiences, we realize that only as he names things and colors of significance ("snotgreen") on the beach, do they become "visible" both to him and us. The world exists prior to Stephen's being there to "read" or "name" it, yet it also does not exist to us without his thoughts.

Therefore, his investigation into space and time seems less borne from discourse than from the gaps within the ability of matter or language to explain. He describes the visual world before him as "*Nebeneinander*," German for "next to one another"—which refers to both space and visual art as we see it, whole. This thought might remind us of the "ideal" vision of art that Joyce belittles in "Drama and Life." Stephen shuts his eyes and feels the shells cracking under his boots—proof of their existence outside his vision—but realizes that sound too emphasizes the "ineluctable modality of the audible." However, "*Nacheinander*," which relates to time, seems to foster a less idealized understanding, as it refers to things arranged one after another, successively, like poetry or music.[10] While space tends toward the creation of imaginary wholes of experience, time allows for a differential experience, where the change at any one moment might occur erratically. Poetry and music inspire new meanings with every pause, change in tempo, or fluctuation. It is this perception of time as successive and individualized that brought Einstein to his thought experiment on simultaneity and brings Stephen to realize the dependence of time and space on each other as definitions. "A very short space of time through very short times of space" (37). Time is defined by the duration of getting from one short space to another, and space is defined by distance, measured by length measurements decided upon by a factor of time. Stephen's attention thus revolves around the quanta of history: the cracks in definitions and those small shifts and changes that occur unpredictably and, when arranged as timelines of facts in the "space" of historical discourse, become part of "one great goal," as Mr. Deasy puts it—projecting a false telos, a false whole.

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[10] I am indebted to Jeri Johnson for linking Aristotelian ideas to Stephen's thoughts and defining the German terms with lucidity. See Johnson, "Explanatory Notes" 781-786.

Joyce and Einstein do not describe "drama" and "wonder" as peaceful, underlying truths waiting to be discovered, but as volatile forces that are forever in conflict with and elude "convention" (Joyce) and the "world of concepts" (Einstein)—much like Lacan's Real. Furthermore, the violence arises from a fundamental urgency, which Einstein calls the "mysterious drive" and Joyce calls "Necessity."

> If you ask me what occasions drama or what is the necessity for it at all, I answer Necessity. It is mere animal instinct applied to the mind. Apart from his world-old desire to get beyond the flaming ramparts, man has a further longing to become a maker and a moulder. That is the necessity of all art. (Joyce, *Critical Writings*, "Drama and Life" 43)

> Behind the tireless efforts of the investigator there lurks a stronger, more mysterious drive: it is existence and reality that one wishes to comprehend. But one shrinks from the use of such words for one soon gets into difficulties when one has to explain what is really meant by 'reality' and by 'comprehend' in such a general statement. (Einstein, *The World As I See It* 137)

A 'rampart' as Joyce uses it is a manmade erection of society constructed as a defensive wall either to exclude bodies out or confine them in. As Joyce's dramatic "necessity" seeks to go beyond these ramparts, so Einstein's "mysterious drive" fights to get beyond the signifiers of "reality" and "comprehend" because the Real seems to be something that we simply experience—beyond the Symbolic order of language.

Neither Einstein nor Joyce subscribes to a purely inside-outside view of comprehension, where the Real lies at the boundaries of the Symbolic; for being on the "outside" would imply that there is a whole, an ideal, that successfully excludes "drama" and "wonder." Rather, they both figure this drive as one that seeks to understand fundamental lacks and holes within the "ramparts." From the Greek hero Ulysses' ingenious Trojan Horse, we can see that forcing one's way inside the "ramparts" is also a way to go "beyond" and topple the kingdom of convention. We can thus see why Joyce also correlates this "Necessity" to bring forth drama with the act of creation. Investigating the lack at the core of these ramparts involves being "a moulder, a maker" of Trojan horses, the success of which came from foregrounding its own emptiness, the lack from which the power of revolution could emerge. Einstein too is not concerned with finding other

words to satisfy this "mysterious drive." He simply acknowledges the lack within "reality" and discredits his own understanding of "comprehending," despite his intensive study of both reality and thinking throughout his life.

Joyce finds drama to fall short when it fails to defy, transgress and question convention, instead opting for false ideals. As he grew out of his late teenage years, his greatest literary annoyance was the Irish Literary Theatre, led by the likes of W.B. Yeats and Lady Gregory, whose talent he admired but whose aim for representing a unified Irish national culture he found flamboyant and "obnoxiously Irish," according to Joyce's biographer Richard Ellman (*Critical Writings* 68). The Irish Literary Theatre players' copious use of Irish mythology and language in their works irked Joyce, who thought Ireland's literary revival should lie in examining the "real" nature of Irishness rather than myth or ideal (which might explain why his works deal far more with investigating Irish Catholicism and Protestantism than bygone Irish lore). In "The Day of the Rabblement," Joyce criticizes Yeats' "treacherous instinct of adaptability," pandering to the "rabblement" by creating works that were "placid and intensely moral…enthroned in boxes and galleries amid a hum of approval" (70). He reiterates that "the Irish Literary Theatre by its surrender to the trolls has cut itself adrift from the line of advancement" in "Drama and Life" as well: "Life we must accept as we see it before our eyes, men and women as we meet them in the real world, not as we apprehend them in the world of faery" (71; 45). This explains why Joyce worshiped the realism of Ibsen and found the best drama to emerge out of the "dreary sameness of existence," the "most commonplace, the deadest among the living." Though he acknowledges that "pining for what is not" is an ineluctable part of the human condition, he says that arming ourselves with nostalgia for myth will ill-equip us; only understanding "our true position" will.

Joyce's own use of the Greek myth of Ulysses written by Homer at once approximates and questions the psychoanalyst Carl Jung's idea that myths provide a structuring element to thought and experience. While the episodes of the novel correspond to different episodes faced by Ulysses the Greek hero on his journey home from war, they also overturn any preexisting notions

held by the reader about the myth by focusing on Leopold Bloom, the non-heroic everyman, in his plodding routine throughout the day. Rather than staying true to the structuring and elevating element of myth, Joyce plays with the structure itself—the apparatus of form and language through which one creates novels and myths. Realism, to Joyce, meant using drama to investigate the commonplace and offal, the lacks within our own existence, the lacks within existing literary convention. That alone, to him, seemed to provide a way to traverse the "what is not," the Real that eludes signification in the Symbolic order.

In the physics that Einstein learned during his years at Zurich Polytechnic, the lacks in science seemed to be the axioms of classical mechanics. We can see the way that Einstein also looked within the "ramparts" of absolute time and space, as Joyce sought to look at the "real" and grit of Irishness, to establish the foundations for relativity (and indeed, it must have been "wonder" that led him there).

In "Physics and Reality," Einstein discusses how absolute space achieved axiomatic status in classical mechanics as a result of our failure to understand the origin of our ideas of length. The first fallacy was the "great formal simplification" of referring all bodily objects to the absolute reference frame of the earth. The very word *geometry*, rooted in the Greek word *geos* for earth, indicates that "the concept of space is psychologically connected with the earth as an assigned body" (23). While Einstein points out that the Greeks thought of space qualitatively, allowing only for relative explanations of position, the French thinker René Descartes brought about the formalization and quantization of space through the well-known Cartesian coordinate system, which determines a body's position in space through a triplet of numbers (24). While Einstein recognizes that the "purely logical (axiomatic) representation of Euclidean geometry has…the advantage of simplicity and clarity," he notes that it pays for this unity "by renouncing representation of the connection between the notional construction and the sense experience upon which connection, alone, the significance of geometry for physics rests" (24). That "notional construction" assumes that the rigid rods of equal length that might have originally defined our

sensory measurement of such a graphical system, when taken away, provide a representational reality of numbers for the lived experience of space. Such a space assumes that we live in a world where Euclidean geometry alone can explain distances and measurements.

However, a simple thought experiment Einstein presents in *The Evolution of Physics* shows an incongruence: he asks us to imagine one observer on a rotating disk and another standing at rest, off the disk. In the resting observer's coordinate system, he draws a replica of the rotating disk, measures its circumference and radius, and finds that the ratio of the two is pi. However, if the observer on the disk, using the same measuring rod as the outside observer, tries to measure the circumference of his disk, his rigid ruler will contract in the direction of the disk's motion. The special theory of relativity shows that as observers travel faster, lengths contract (at light speed, they absurdly contract to zero). When he measures the radius, however, the length will not contract (as the disk is merely rotating and not moving along the axis of its radius). The ratio of the circumference to the radius, according to the disk observer, will not be pi. While Newtonian mechanics only considered frames of reference that were "inertial," where motion is uniform (not speeding up or slowing down), the rotating disk—although rotating at a fixed speed—is still undergoing acceleration because it is changing direction at every point (and thereby changing the velocity, which describes both speed and direction). Only non-Euclidean geometry and a conception of non-uniform motion could account for the type of acceleration found on the rotating disk (240-243). Until Einstein's inquiry into systems of measurement, the Cartesian system of objective reality, based on a system of rigid rods of measurement, had given way to an exact representational reality called "space" without our considering whether a rod's measurement could ever change. However, the very idea of "rigidity" seemed based on an ideal rather than the Real of our multidimensional experience.

Likewise, Einstein's description of the evolution of absolute time shows how a local concept, fragmented, became generalized as absolute and whole. Crucial to its construction was what Stephen referred to as *Nacheinander*, or the subjective sequence of events in a space

measured by a clock, defined as a "closed system of periodical occurrence" ("Physics and Reality" 25). What locally was perceived as time became "enlarged" to represent the idea of objective time mainly because in our day-to-day experience, we can ignore the time it takes for light to travel (once again failing to note the measuring apparatus that defines the concept). While we will look at his breakdown of absolute time in detail in the next chapter, its apparent hegemony preoccupied Einstein for "years," as he would later say. It was apparent to him that the course of physics was "condemned to failure as long as the axiom of the absolute character of time, or of simultaneity, was rooted unrecognized in the unconscious" ("Autobiographical Notes" 51). Einstein's insight into the subject position of his discipline, which Lacan would say was rooted in the Big Other of unconscious signifiers, thus allowed him to identify the cracks within language through which could emerge a Realer reality. His relentless examination of the "lacks" in the measurement tools (clocks and rods) that define concepts correlates to Joyce's examination of language and myth as malleable and non-absolute in structure. Einstein inspired similar inquiry among later scientists like Niels Bohr and Werner Heisenberg, whose investigation of the impact of measuring apparatuses on objectivity led to the advancements of quantum physics that Einstein would later question. Indeed, no one but Einstein set the stage for such inquiry.

We can see Joyce's equivalent inquiry into the "lack" in language through the way Stephen directs his attention to images of emptiness throughout 'Proteus." From the outset, an episode named after the Greek god of change, known for his shape-shifting, evokes the irony of naming a god of change: the number of names human societies have assigned to God—from Mother to Father to Supreme Reality to Truth to YHWH—shows a sliding signified that seems to represent, above all, the lack of any signifier's ability to represent that concept.

Stephen derisively thinks about his own attempts to be "deeeply deep" in the epiphanies (short sketches that contain a realization of the "whatness of a thing"[11]) that he had written in college. He had imagined at the time that copies of those writings would be sent to "all the great libraries of the world, including Alexandria," the symbolic repositories of knowledge. He was going to simply title the epiphanies with letters like F, Q and W—and he imagines a sarcastic conversation between readers: "I prefer Q. Yes, but W is wonderful" (41). Disgusted at his youthful naiveté and self-affirming belief in the depth of the letter, he thinks to himself, "you bowed to yourself in the mirror, stepping forward to applause earnestly, striking face." Again, Joyce like Lacan uses the mirror to show a moment of idealized wholeness and meaning—and ties that false perception to the ability of the word to show depth. But despite Stephen's self-consciousness at this fundamental failure of the letter, as an aspiring poet, he feels that he cannot escape the symbolic order, the binding affirmation of society's "applause." He must "play the poet" in hopes of becoming one: "My Latin quarter hat. God, we simply must dress the character. I want puce gloves" (41).

Immediately following this passage, the erratic movement of Stephen's thought language comes to rest on a series of empty protuberances of matter: a porterbottle, an "isle of dreadful thirst"; a clothesline with "two crucified shirts," bodyless; "wood sieved by the shipworm"; and "broken hoops." All of these signifiers point back to Stephen's obsession with what is not there, the fundamental lack in his thought world (the Imaginary) that arises from the need for all his artistry to find form in the symbolic language.

These images of lack in language directly relate to Lacan's idea of the phallus' function in constituting our identities. Prior to Lacan, Sigmund Freud had theorized that the male phallus in our patriarchal society not only serves as the symbol of power, wealth, success and fullness in

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[11] As Joyce writes in *Stephen Hero*, the epiphany is the sudden "revelation of the whatness of a thing" when "the soul of the commonest object…seems to us radiant." Though the origin of the term epiphany is decidedly Christian, Joyce means for the artist to look for epiphanies among men, not gods (Ellmann 87).

all its meanings, but also that the phallus corresponds to the biological male organ. The final claim was extremely controversial because of the seeming inescapability of the phallus' domination, since it was tied to the male and denied the female from birth. Lacan, however, felt that sexual difference was not so simple as to be biological; rather, the complexity of our position in the Symbolic order constitutes our idea of sexual difference. The phallus, to Lacan, was an empty signifier, representing lack, not fullness. By choosing the symbol of "that which is worthy of desire, that which is desirable" and recasting it as the signifier of lack, Lacan sought to show the way that desire is inherently lacking, forever transmitted on a chain of empty signification (i.e. we think we want a Mercedes, but what we really want is respect from our peers, which might represent that what we really want is a better self-image, etc.…). Desire, even for the Divine, is forever slipping on an endless chain of lacking signifiers, as Stephen notices in 'Proteus': "God becomes man becomes fish becomes barnacle goose becomes featherbed mountain" (49). Einstein too writes of this slippage in his *Autobiographical Notes,* recollecting that as a young man he had realized the "hypocrisy and glittering words" that covers the "nothingness of the hopes and strivings which chases most men restlessly throughout life" ("Autobiographical Notes" 3). Einstein's and Joyce's idea of an endless slippage of words that fail to mean correlates directly to Lacan's conception of the phallus. "What does it matter how many lovers you have if none of them gives you the universe?" Lacan once asked.

The way Lacan positions our assumption into language has everything to do with the phallus as a signifier of desire that is always lacking. Let us backpedal for a moment. During our pre-linguistic mirror stage, we learn to identify with another (the image in the mirror) as extensions of ourselves. This perception of false wholeness corresponds also to the mOther, the person who interprets our cries and gives them meaning ("the baby is hungry" or "the baby is tired") (Fink, *The Lacanian Subject* 9-10). In this way, even before we learn language and constitute our subject position, we are already constituted by discourses that shape our idea of who we are and what we want. In the case of Stephen/Joyce, his Irish Catholic heritage that

constituted his early education and ideas of good and evil informs his deep sense of guilt for having refused to kneel and pray at his mother's deathbed. During the Imaginary stage of wholeness prior to language, we imagine ourselves to be the sole object of our mOther's desire—that is, we imagine that we are the "phallus" (and Lacan was clear that the phallus, here, just corresponds to "desired things").

Lacan noticed that in traditional Western, nuclear families, the father figure or another member of the family who takes up the mOther's interest serves to make the final cut between the child and the mOther, ushering the child into the Symbolic order. Lacan calls this term the Name-of-the-Father (which does not necessarily have to be a male father, but simply serves as the signifier that the mother's desire is not wholly satisfied by the child). The Name-of-the-Father uses the "paternal metaphor" to enforce the Law and the prohibition against incest, against regaining that Imaginary mOther/child unity. By performing the first act of "substitution," displacing the child from the sole object of the mOther's desire, the Name-of-the-Father assumes the child into Symbolic law. The child perceives the Name-of-the-Father as possessing the symbolic "phallus," which thus becomes the signifier of desire. The child realizes that he/she does not have the phallus, and is forced to position himself/herself in the Symbolic Order as either desiring to "have" the phallus or "be" the phallus (Hook 72-75). If we think about this in societal terms, there is no arguing that we live in a patriarchal society. Minorities and exclusions seek to come into "being" in society by creating a new identifying name like "feminists" or "Indian-Americans" to coalesce their own power. Language doubles as the symbol of the oppressor and as the object of desire: institutions like the Gaelic League and the Irish Literary Theatre formed solely to pursue the "phallus" of Irish home rule and Irish language and culture. At first glance, this seems to goes back to the idea that there are "haves" and "have-nots" in society. What Lacan seems to say by illustrating the phallus as lack is that these binary distinctions are inherently false: we are all either desiring something that cannot be had or are thinking we have something that we do not. Joyce too found the pursuits of those Irish nationalist

groups as inherently lacking, flimsy attempts to approach a Symbolic ideal rather than a Real understanding of Irishness. The "phallus"—call it power, desire, "having," privilege—does not exist except as signifiers. It is not Real. Lacan points to this moment of positioning as the way men and women establish sexes: men, as a result of having some semblance of a physical phallus, seek to "have" the "phallus"; women want to "be" the "phallus," as in be desired by it and come into "being" through it. In this way, men and women alike see the phallus as also the signifier of their own "lack" (Hook, 75-77).

The usefulness of the "phallus" as a symbol of lack is that it shows a hole within the overbearing, patriarchal Symbolic order itself—allowing for the Real to be a reconstituting discourse, forever in conflict with and shaping language and law (as we see Joyce's "drama" and Einstein's "wonder" did). Lacan's famous pronouncement that "there's no such thing as a sexual relationship" seeks to get at the fundamental lack involved in seeking "phallic" pleasure: as the eminent American Lacanian scholar Bruce Fink put it, "there is a barrier between my desire for something as formulated or articulated in signifiers…and what can satisfy me" (Lacan, *Seminar XX* 145; Fink, "Knowledge and Jouissance" 37). Einstein's and Joyce's love lives seem to fit this description perfectly: as men who sought to find the gaps and holes in the axiomatic systems of knowledge that towered over them, the idea of a law-abiding marriage or conventional sexual "union" pandered to the Symbolic. What were they missing? As Lacan says, "the universe": Real knowledge.

For whatever we felt was "lost" when the symbolic law and language severed us from the fantasy of our mother-child union becomes what we hope to find in a lover—a pleasure Lacan called "jouissance." Fink relates jouissance to the pursuit of knowledge, as the science of the ancient Greeks also revolved around fantasies of wholeness, oneness and circles—all, of course, based on the unification found in copulation. He describes Aristophanes' idea in Plato's *Symposium* that we all used to be spherical beings until Zeus split us in two, and ever since, we have been in search of our other half. The grace of Zeus was that he put our reproductive organs

on the inside, so we "split subjects" can ever seek union, pleasure and wholeness in the other. "Love," Aristophanes says, "thus seeks to refind our early estate, endeavoring to combine two into one and heal the human sore" (qtd in. "Knowledge and Jouissance" 29). The mindset of wholes as metaphors for complete knowledge did not end with the Ancient Greeks, as we can see in the twentieth-century fantasies of physicists seeking to find a unified field theory that will happily "marry" the laws governing macroscopic and microscopic bodies.

However, in the Lacanian view, this search for a whole or One is essentially fruitless, as it is simply a fantasy of the Imaginary, as we saw in our overview of the mirror stage. Knowledge systems that purport to be complete within themselves—including even Lacanian psychoanalysis—are always doomed, as there are always gaps within the signifiers that constitute these systems. Likewise, we forever perceive a deficiency in the pleasures we find in everyday life and in the supposed "union" of sexual relationships. Even the pursuit of knowledge in the sense of creating a complete system is thus related to the incomplete and lacking nature of phallic jouissance. But looking for lacks within knowledge itself, as Joyce and Einstein sought to do, might lead elsewhere: to the Real.

The Ab-sens of Women

In light of the "lacking" phallic signifier, we can see why Stephen's attempts to reclaim manhood fail in 'Proteus.' As he continues his sojourn along Sandymount Strand, he encounters a dead dog carcass washed up onto the beach and, immediately after, sees a live dog running toward him. In a strange version of the mirror stage, Stephen, after having encountered Mulligan's looking glass earlier in the first episode, sees instead of a whole, a diminution of himself, an animal. As Mulligan calls Stephen "Dogsbody," Stephen immediately constructs an identification between himself, the dead dog carcass and the live dog. By describing the dead dog as a "carcass," Joyce invokes more than mere death: the body remaining shows a "life-in-death,"

as the Oxford English Dictionary defines "carcass" as 1) "Anything from which the 'life', 'soul', or essence is gone; the lifeless shell or husk, the 'corpse', 'skeleton'"; 2) "The living body considered in its material nature."; or 3) "The decaying skeleton of a vessel or edifice; a ruin." The emphasis is on a life that is lost and a material body remaining, husklike, persisting in the world of objects. A carcass is thus lack embodied.

Confronted with such a raw picture of his own barred nature from Reality, Stephen attempts to assert his manhood. As he sees the dog running toward him, he fights away his fear by remembering "I have my stick," his phallic walking stick. His thoughts race through a number of real tragedies—"famine, plague and slaughters" in Irish history—when Dubliners were forced to become animal-like, barbaric, and assert their manhood: during a 1331 famine, starving, they flayed a school of turlehide whales that had become beached on the shore. "Their blood is in me, their lusts my waves," Stephen thinks. While earlier, the "snot-green" sea had been associated with his mother and Ireland, now the sea becomes "Father Ocean," an androgynous entity, at once mother, at once barbaric, bestial and manly. Stephen then contemplates "all kings' sons" who aspired to the English and Irish throne, and he wonders whether he would have saved a man who had drowned earlier in the week ("Would you or would you not?...I am not a strong swimmer"). These images of manhood, lineage and patriarchy—the symbolic order—precede the breakdown of these very ideas: he realizes he would not have jumped into "Father Ocean" to save the man, because he does not have faith in his swimming ability or virility (think of sperm swimming too). As he identifies his own lack, the forcible emotions of the Real suddenly wash through his consciousness: "I… With him together down… I could not save her. Waters : bitter death : lost." Words fail him as he associates his inability to save the drowned man with his failure to save his mother's life and soul, as he refused to follow her dying wish to pray at her bedside. Only ellipses can figure the Real of the emotion flooding his consciousness at that moment (45).

The way Lacan figured women in his psychoanalytical theories might give us insight into why Stephen is unable to figure his mother in words. "When one loves," Lacan said in one

seminar, "it has nothing to do with sex" (qtd. in Fink, "Knowledge and Jouissance" 25). While sex is associated with the phallic jouissance that reduces one's partner to an object of desire, true love in Lacan's ideology is not signifiable: it cannot be reduced to an object or a word, because it is Real.

Because men aim to "have" the phallus, they are wholly and completely circumscribed by the Symbolic order and the Name-of-the-Father—they have an understanding that they will, one day, have the power and authority they might think the phallus represents. But women, by seeking to "be" one, innately understand that they lack it and cannot have it. By this innate understanding of their lack, they are, in part, outside the Symbolic order—outside language and the law. Lacan pronounced:

> When I say that woman is not-whole and that that is why I cannot say Woman, it is precisely because I raise the question *(je mets en question)* of another jouissance that, with respect to everything that can be encompassed in [the symbolic order], is in the realm of the infinite. (qtd. in *Reading Seminar XX*, 103)

While the false "whole" of the Symbolic order seemingly constitutes our reality, from our thoughts to our laws, there is a lack inside the Symbolic order itself; this is the "not-whole" of the Real that comes through in the lacking signifiers of an empty bottle and "crucified shirts" that Stephen sees throughout 'Proteus' and in the ineffable emotions memories of his mother bring about, which he can only represent in ellipses and gaps in language. In other words, women have access to the place where language itself is barred: they have access to the "realm of the infinite," which is the Real. Just as Lacan "cannot say Woman" because the Symbolic does not fully encompass them, so Stephen cannot speak his mother.

We see Stephen's second encounter with the Lacanian Real in 'Proteus' when the live dog he associates with himself walks closer to the carcass of the dog, the husk of itself showing its "barred" nature in all its Reality. "He stopped, sniffed, stalked round it, brother, nosing closer, went round it….Dogskull, dogsniff, eyes on the ground, moves to one great goal. Ah, poor dogsbody. Here lies poor dogsbody's body." The dog and Stephen both see their lack at this

moment, only to be interrupted by the scream of the dog's master: "Out of that, you mongrel!" The Symbolic intervenes in this moment of Reality, and a "blunt bootless kick," the suitable punishment for transgressing the "ramparts," sends the live dog flying across the sand. He then starts digging in the sand, "delving…with a fury of his claws, soon ceasing…vulturing the dead," attempting to recover whatever it was that was just lost (46). Stephen too attempts to make sense of this moment, but becomes caught up in signification, in quoting the words of other people. His next thoughts quote stanzas and lyrics of other people's songs: a 17th century canting song called "The Rogue's Delight in Praise of his Mort" and Thomas Aquinas in *Summa Theologica*. But as the two owners of the dog pass him, eyeing his "Hamlet hat" and thereby calling attention to the fakery involved in his "playing the part" of a poet, the Real erupts again:

> His lips lipped and mouthed fleshless lips of air : mouth to her womb. Oomb, all wombing tomb His mouth moulded issuing breath, unspeeched : ooeeehah : roar of cataractic planets, globed, blazing, roaring wayawayawayawayawayaway.

In this cosmic "unspeeched" breath that calls out to the "cataractic planets," Stephen finds both poetic creativity and a way to "speak" his mother. By putting his "mouth to her womb," he preemptively stops what Joyce in the later 'Oxen of the Sun' episode calls "postcreation": "In woman's womb word is made flesh but in the spirit of the maker all flesh that passes becomes the word that shall not pass away. This is postcreation" (373). With obvious Biblical overtones, referring to Christ as the Father's "word made flesh," Joyce portrays the way scripture written after the "word made flesh" becomes the word once again—postcreation by man, assumed into the Symbolic order and Christian laws that seek to keep reiterating the original Name-of-the-Father act of societal creation (*King James Bible*, John 1:14).

Earlier in 'Proteus,' Stephen refers to the *lex eterna,* Latin for "eternal law," which Thomas Aquinas posited in *Summa Theologica* as the divine law in which everything that has been and everything that is yet to come exists within God, since he is eternal (Johnson, "Explanatory Notes" 785). But Stephen rejects this postcreation. He is decidedly not of the

"divine substance" that constituted God the Father and the Son, making them "consubstantial": rather, he was "wombed in sin….made not begotten" by "the man with my voice and my eyes and a ghostwoman with ashes on her breath" (38). Rather than through word or law, Stephen wants to exist and create on things unsignifiable and therefore Real: a voice, a gaze and breath[12]. Unlike the Father God's act of making a word into flesh, he prefers "creation from nothing," from lack (38). In his act of creation after experiencing the "lack" in the form of the dog carcass, he imagines putting his "mouth to her womb" and finding life-in-death, as the live dog did, in the "all wombing tomb." Rejecting the word takes him away from "postcreation" and enables him to become a "moulder," as Joyce said a true dramatist must be to go beyond the "ramparts" to Stephen's destination: the "wayawayawayawayawayaway" of the Real.

Just as Lacan said that he cannot say "Woman," so Stephen seems unable to articulate his mother in conventional language. Yet he is fully capable of talking about the Father and the Son, who are enveloped wholly by the Symbolic order. But women, as Lacan said, "ex-sist" in the "not-whole" of the "whole": in the lack in language. Existence, or reality, for Lacan, is defined by the Symbolic order. However, he says women's "ex-sistence" makes them unsignifiable in many ways—so Stephen must resort to onomatopoeia and new words ("ooeeehah" and "unspeeched") in order to "say" woman.

But what implication does this have for women? The concept of women as prediscursive and in a state of nature has been one that feminist theorists have sought to dispel since the latter half of the twentieth-century, starting with Evelyn Fox Keller's useful intervention in *Reflections on Gender and Science*. Furthermore, Lacan's formulation that all that is signifiable is necessarily contained in the phallic patriarchal Symbolic order excludes women from participating in the discourses of reality (with a lower-case "r"). Judith Butler among others has sought to show his theory as phallagocentric, as it "deploys the penis as its naturalized instrument and sign" and thus

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[12] However, Fink describes how the Real object that we are attracted to in a partner (the voice or the gaze) does not achieve the significance we hope it will achieve upon sexual intercourse. The phallic jouissance fails to deliver the Real (*The Lacanian Subject* 92).

the "law requires conformity to its own notion of 'nature.' It gains its legitimacy through the binary and asymmetrical naturalization of bodies" (*Gender Trouble* 135). Butler's remedy for Lacan's patriarchal order is to suggest that sexual identities like "women" come into being in a performative way, through speech acts and gestures that constantly reshape language and extend the Symbolic. Exclusions make way for the symbolic law and power to "swerve from their original purposes and inadvertently mobilize possibilities of 'subjects' that do not merely exceed the bounds of cultural intelligibility, but effectively expand boundaries of what is, in fact, culturally intelligible" (*Bodies That Matter* 83). In this way, the limitations of discourse—what symbolic law represses or excludes—can come into being by very nature of its exclusion (consider the women's liberation movement, the Civil Rights movement, the gay rights movement, etc.).

Yet tied up in these liberations is the act of naming, which Butler says can produce a "violent rift" because of the "coalitional politics that requires one identification at the expense of another" (*Bodies That Matter* 181). These new identifications form nodes of power from which other identifications are excluded, and Symbolic law persists onward (we will explore in the next section how Einstein rejected the psi function of quantum mechanics because of this very violence). Like Butler, Einstein is acutely concerned with the problems inherent in naming groups or new concepts, even those previously excluded from language, because they lead to clumsiness if they do not serve to reexamine a preexistent lack. For Butler, the feminist theorist, what is at stake is the ability of women to influence the patriarchal discourses that exclude them; for Einstein, the physicist, it is the ability of scientific concepts to retain the ability to change even if they have become part of convention. He even qualifies the term 'objectivity' by saying it does not presuppose a group-characteristic, but "that the group-characteristic forces a refinement of the concept of objectivity. The positing of group characteristics is heuristically so important for theory, because this characteristic always considerably limits the variety of the mathematically meaningful laws" ("Remarks to the Essays Appearing in This Collective Volume"681). Group

characteristics, like Lacan's orders, are useful for creating systems and heuristics to use to approach new problems. But importantly, Einstein shows that even the monolithic classical concept of objectivity must be left open for "refinement" as new groups come into being. Both Einstein and Butler seem to be arguing here for both a performative and re-informing aspect to identification that could cultivate a sensitivity in society for naming and extending the Symbolic to include exclusions in the discourses of reality. But then are we to give up the Real that Stephen accesses through creativity, invention and word play?

After Stephen gains inspiration from the Real, he immediately snatches a piece of paper and begins writing a poem. But to his dismay, the poem comes into being as "signs on a white field" (Joyce, *Ulysses* 47). "Who ever anywhere will read these written words?" he wonders bleakly. He goes on to berate himself for bringing his artistic vision's phantom woman, with "hand gentle" and "longlashed eyes," from "beyond the veil" into language. By making her enter reality via the Symbolic Order, she loses her Reality: she becomes associated with other signifiers in his memory like the "virgin at Hodges Figgis' window on Monday" (48). He cannot capture that elusive moment of creativity in signifiers: "What is that word known to all men?" (48). In a later episode, he realizes the word is "love," but as Lacan posited, "love" beyond the pursuit of phallic desire is unsignifiable, outside of the Symbolic order.

Though Stephen attempts to signify love through a new language informed by onomatopoeias, which attempt to constitute both form of language and meaning of sound at once, the Real fails to come through when he reflects on it in his thought world or in the language known to society. He once again becomes the dog smelling the carcass and digging endlessly for an unknowable reason, unable to transcend the limits of the signifiers because of his phallic lack. While Butler and Einstein seem to want a recourse within the Symbolic order of language for the refinement of old boundaries of identification, Joyce seems to agree with Lacan's view that women—and thereby the Real—simply elude representation: the role the artist must play is to "[forgo] his very self and stand a mediator in awful truth before the veiled face of God," Joyce

writes in "Drama and Life." That "awful truth" might indeed be the act of embracing the "all wombing tomb" over *lex eterna*, for confronted by the "veiled face of God"—the barred language that cannot signify the Real—the artist must create new ways of expression (*Critical Writings* 42). The use of nonsense and word play to signify a lack thus allows Joyce to show the ab-sens (playing on the French word *sens* for sense, as in the senses, or a "sense of reality") of women in language, which brings forth in Stephen an experience of the Real. This, more than dead carcasses, Stephen's public urination during 'Proteus,' or the "fact" that real people and places are littered throughout the novel, is the sign of Joyce's Realism beyond realism. Women thus bring forth drama beyond form, merely palpable as a "personal woe."

But Einstein, as a scientist, had to resign to a realism of a different brand. While many critics and historians of science have pigeonholed Einstein into classicism and "realism," his writings show a man much more conflicted—always searching for ways to express "lacks"—rather than a crabby physicist resigned to an old order of science. His understanding of science's aim, on one hand, does not seem far from Joyce's aim as an artist: to "collect the unordered facts available and make them coherent and understandable by creative thought" (*The Evolution of Physics* 5). But these thinkers' ideas of "coherence" differ sharply (Joyce, a writer, has no problem operating in nonsense—which could provide somewhat of a barrier in science). In *The Evolution of Physics*, Einstein compares a scientist trying to explain the universe to a man trying to understand the mechanism inside a closed watch. The man hears the ticking and comes up with a picture of what actions may be taking place inside. But "he will never be able to compare his picture with the real mechanism and he cannot even imagine the possibility or the meaning of such a comparison" (33). Einstein's "ideal limit of knowledge that is approached by the human mind" is thus asymptotic, never quite reaching a physical reality. This limit appears either because knowledge, as transmitted by language, fails to fully express "wonder," or because the Real is simply incomprehensible.

In light of these ideas, Einstein does not seem to be a die-hard believer in objective truth, as some scholars have painted him to be. He simply believed that the mystery story has "patterns" that are discernible—which is much more fun than a mystery story without patterns, he writes. The discernment of patterns seems to be the aim not only of science, but also of psychoanalysis and literary criticism. However, psychoanalysis and literary criticism are less concerned with facts than with finding new ways to explore old problems (novels that have been written about for decades and psychic complexes that have been documented since Freud). Science, in general, thrives on the frontier. While Joyce, as a writer of fiction, could opt to create meaning that only resonates with each individual reader's "personal woe," Einstein, as a physicist, had to find ways to express what was lacking through understandable and generalizable methods that could then apply to new problems.

Through Einstein's systematic inquiry into electromagnetic theory, we can see how he subscribes to the principles of reducibility, simplicity, and unity—as opposed to Joyce's infinity and complexity—to discern the most "real" of scientific language. To him, the beauty of Maxwell's electromagnetic theory was that it merged the concept of the material point with continuous force. Rather than positing that a force like gravity could act at a distance, instantaneously between two objects, electromagnetic field theory brought about the understanding that forces were the result of physical changes in the "*immediate neighborhood* at a time *just past"* between objects (*The Evolution of Physics* 153). It resolved the paradox that our physical experience only shows "reciprocal action…through contact" while classical mechanics showed forces working through "action at a distance" ("Ether and Relativity" 162-163). Einstein's admiration for this unification stems from the fact that it establishes stronger causality between occurrences: "in the new field language it is the description of the field between the two charges, and not the charges themselves, which is essential for an understanding of their action" (*The Evolution of Physics* 157).

Einstein also found that the field theory allowed for seemingly disparate experimental results to become related by their reducibility to one another. Before Maxwell, scientists had found that a changing magnetic field induces an electric field and vice versa, that a moving electric coil induces a magnetic field around it. If the language of fields did not exist, Einstein writes, induced current in a wire as a result of a moving magnet nearby would have to be explained by the material objects involved (like the velocity of the magnet, its shape, or the shape of the wire). But with the "language of fields," one can generalize that fields depend on more than simply the material object. A solenoid (coiled wire) moved through another solenoid could also induce a field, since solenoids also act like magnets and have the same patterns of charge emanating from the positive end to the negative end (132). The reducibility of solenoids to magnets, of electric fields to magnetic fields, allowed for the creation of the secondary concept of electromagnetism, which could be reduced directly down to the primary concepts of electricity and magnetism. Thinking back to Einstein's ideal of scientific language from "Physics and Reality," electromagnetism thus represents a prime example of a secondary theory that achieves greater unity without losing its connection to experimental sense-observations.

While these ideas still revolved around material objects—a magnet and an electric coil—Maxwell's equations reduced those material objects even further, into points of undulating charge that induce electric and magnetic fields alternately. Einstein admires the way Maxwell reduced the concept from observation to something that was unobservable but palpable in its creation of electromagnetic waves such as light. "Slowly and by a struggle the field concept established for itself a leading place in physics and has remained one of the basic physical concepts," Einstein writes. "The electromagnetic field is, for the modern physicist, as real as the chair on which he sits." (158). Not only did electromagnetic fields unify the phenomena of electricity and magnetism, but they also showed the way that observed electric and magnetic phenomena could be reduced to points of undulating charge that induce fields propelling electromagnetic waves. The ability of electromagnetic theory to provide new insight where old concepts and observable

experience were inadequate seemed to prove to Einstein the efficacy of the values of science—reducibility and unification—in reaching a Real underneath bulkier concepts of classical mechanics.

Despite the apparent unifications and "reducible" concepts that came from electromagnetic theory, there were a few ways in which it still seemed to lack simplicity. Firstly, "it appeared beyond question that light must be interpreted as a vibratory process in an elastic, inert medium filling up universal space" (Einstein, "Ether and the Theory of Relativity" CPAE 7:164). Just as sound was known to propagate itself longitudinally through air, so physicists proposed that the transverse waves of light must travel through a "luminiferous ether"—a hypothetical substance rigid enough to allow fast vibrations but somehow malleable enough not to impede planetary motion (Perkowitz 1). Already this new substance seemed problematic to 19th century scientists who preceded Einstein. To Einstein, the "clear and simple" elegance of Maxwell's electrodynamics were marred by the apparent "clumsy and contradictory" creation of ether, a secondhand theoretical concept far from the basis of experience (Einstein, "Ether and the Theory of Relativity," CPAE 7: 166). Much of Einstein's dissatisfaction with the ether concept came from its apparent inability to signify anything: "The word ether has changed its meaning many times in the development of science," he writes in *The Evolution of Physics* (159-160).

Directly related to "ether" was the similarly lacking concept of the absolute frame of reference—the exploration of which directly led Einstein to the formulation of his theory of special relativity. Simply put, Maxwell's electromagnetic equations seemed to privilege one observer's point of view over another's. The following thought experiment proved irksome for Einstein and physicists who preceded him, according to John Norton, a historian of science who has studied Einstein's influences extensively.[13]

[13] Norton maintains an online database of papers on Einstein's thought called *Einstein for Everyone*: http://www.pitt.edu/~jdnorton/teaching/HPS_0410/chapters/index.html

When a magnet is in absolute motion, an electric field is created in a direction perpendicular to the magnetic field. The changes in the magnetic field's strength as it moves create an electric field. It would seem that a definite marker of the magnet's movement would be that an electric field would appear if it were moving (Fig. 3). At rest, we would only be able to see a magnetic field (Fig. 4). This is what Michael Faraday's law of induction says: "It is irrelevant whether the magnet or the conductor is moved; what counts only is the relative motion," as Einstein writes ("Fundamental Ideas and Methods of the Theory of Relativity, Presented in Their Development," CPAE 7: 135).

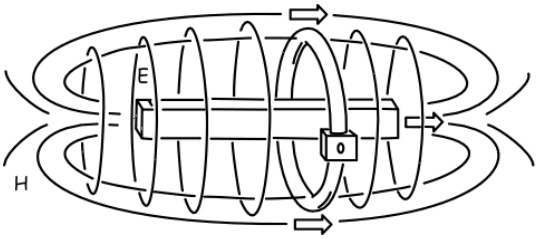

Fig. 3: The induced electric field, perpendicular to the magnet's motion, from John Norton, "Magnet and Conductor," *Einstein for Everyone* (University of Pittsburgh: 2003), Web, 03 Nov. 2011.

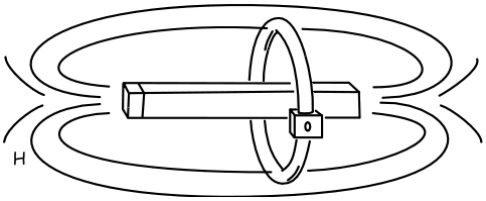

Fig. 4: Magnetic field surrounding a magnet at rest, from positive pole to negative pole. From John Norton, "Magnet and Conductor," *Einstein for Everyone* (University of Pittsburgh: 2003), Web, 03 Nov. 2011.

But Maxwell's equations show that depending on which frame of reference we use, we get different results when we solve them. For a rider on top of the magnet, when the magnet is at rest and instead the conductor moves, there is no perceptible electric field, according to the equations. But from the point of view of an outside observer at rest in the ether, there would be an electric field if the conductor alone were moved (and the magnet remained at rest).

Einstein found it "unbearable" that the results of Maxwell's equations were not the same for all frames of reference, because the equations privileged the tenuous, external "ether" frame:

> The difference between the two, I was convinced, could only be a difference in choice of viewpoint and not a real difference [in the reality of nature]. As seen from the [moving] magnet, there was certainly no electric field present; whereas seen from the circuit [ether state of rest], there certainly was an electric field. Therefore, the existence of the electric field was a relative one, according to the state of motion of the coordinate system used; and only the electric and magnetic field *combined*, apart from the state of motion of the observer or the coordinate system, could be granted a kind of objective reality. The phenomenon of magneto-electric induction forced me to postulate the principle of

> (special) relativity. ("Fundamental Ideas and Methods of the Theory of Relativity, Presented in Their Development," CPAE 7: 135)

The "lack" that Einstein discovers here parallels that of the Lacanian phallus. For Lacan, sexual difference came about in relation to the lacking signifier of the phallus, and for Einstein, different solutions for this problem came about because of the lacking signifier of the absolute (ether) frame of reference. He understands the discrepancy in results to stem from "difference in choice of viewpoint and not a real difference"—an insight that Lacan also comes to in terms of the sexes in psychoanalysis. The only way that Einstein is able to solve this problem is by seeing the phallic signifier for being empty: the ether frame of reference is arbitrary and symbolic, while the self-propelling electromagnetic field action is "real." While Lacan's Symbolic order confines a subject to a certain position in reference to the phallus, to language, Einstein is able to bypass the bounds of language by using his "memory-pictures" to examine the gap of signification. He imagines himself at once riding on the magnet and standing in the ether, and sees that the simultaneous results are different. We will see in the next section that his thought experiment on special relativity uses this same trick to bypass signifiers as the sole modes of exploring reality.

Einstein's ability to see the structural lack within the system of electromagnetic field theory correlates with Lacan's refusal to name Woman. The words "ether" and "woman" are phallic signifiers in the symbolic order that do not seem to capture the Real of experience—just as Einstein's early love letters to Mileva show the inability of words to capture his passion for her boundary-defying personality in her younger years. Einstein's thought experiment showed that the ether frame of reference is a false convenience that shows holes in theory, and Lacan's idea that part of "woman" ex-sists beyond language corresponds to holes in the Symbolic (and Stephen's inability to express the experience of a mother's love in words).

Einstein, influenced not only by science but also by the tensions in Europe leading to World War I, writes in other works like "My Opinion of the War" that there is a "biologically determined feature of the male character" that seems to be the cause of structural ideals like

patriotism and militarism (qtd. in Isaacson 208). In a 1914 letter to his friend Heinrich Zangger, he asks, "What drives people to kill and maim each other so savagely? I think, in the end, it is the sexual character of the male that leads to such wild explosions from time to time." In this moment of rejecting what he calls the "*bestia masculina*"—the Lacanian phallic jouissance that desires (patriotism, militarism, victory in war) but never finds—Einstein sees his own lack. "That is how a completely dispassionate person like me can appear lacking to others. It's all the same to me. As long as I am left in peace, I calmly continue my work with the usual pleasure, without letting myself be infected by mass psychosis." Yet this science-inspired "peace" and his repudiation of "*bestia masculine*" is troubled by a passage later in the letter, where he informs Zangger that he has "had the particularly good fortune of separating from my wife…from the point of view of others, this looks like unparalleled brutality. But for me it was a question of survival" ("To Heinrich Zangger, 27 Dec. 1914," CPAE 10: 13-15). There is a tension between his self-aware lack and his repudiation of patriarchal norms and his simultaneous embrace of them in his "brutality" of banishing Mileva—which we explored in the first chapter. During the years of his inquiry into the "lack" of ether, he was experiencing the ab-sens of Mileva, her silent name alongside his work. But after their separation, ab-sens became increasingly absent from his life and work.

In contrast to Butler's claims about Lacan's phallagocentricism, in light of this study of Einstein and Joyce, I side with Slavoj Žižek, who argues that Lacan's contradictory claim that "there is no big Other" shows that the symbolic order is, like the phallus, a "fake, a semblance that conceals this structural inconsistency" ("The Real of Sexual Difference" 72). Furthermore, just as Butler describes how those who are excluded in the Symbolic order such as lesbians can reshape discourse through the performative acts, Žižek says the Real is inherent in the Symbolic: "the Lacanian Real is that traumatic "bone in the throat" that contaminates every ideality of the symbolic, rendering it contingent and inconsistent" (72). In other words, rather than the binary opposition between an overpowering paternalistic, phallic order and the subjects that are

structured by it, we see a lacking symbolic system that is constantly shaped by that which ex-sists, like “woman,” outside of existence as we know it through words or image perceptions. It is ab-sens of women and the Real from language that allows Joyce and Einstein to search for both in the lacks and thus advance literature and science beyond the “ramparts.”

We next look at their traversal of this lack in detail, which came through their further renunciation of the conventions of reality: play.

Fourth Movement

THINKERS AT PLAY

…an animal when playing is conscious of the fact that its activity is not directed towards any aim or towards the satisfaction of the needs of life…Play, art and science are the spheres of human activity where action and aim are not as a rule determined by the aims imposed by the necessities of life; and even in the exceptional instances where this is the case, the creative artist or the investigating scientist soon forget this fact—as indeed they must forget it if their work is to prosper. Generally, however the aims are chosen freely by the artist or student himself, and are superfluous; it would cause no immediate harm if these aims were not pursued.

–Ernest Schrödinger (*Science Theory and Man* 27-28)

Both Einstein and Joyce loved music. As an art that seemed to convey meaning without the impositions of symbolic entities like words or concepts, music, they realized, only comes into being through performance. It must be *experienced* by the player and the listener in order to mean. In a strange symbiotic relationship, the performer cannot perform without the musical piece, but the piece (perhaps existing materially as musical notation on a page) does not mean anything without the performer. The true comprehension of music comes through a listener's experience of both the piece and the performer's interpretation, which brings forth the possibility of infinite meanings with each new performance. Thus music becomes reborn with each iteration

and comes to mean infinitely apart from its finite compositional existence. We can see the "resonance" of this belief in music's boundary-defying ways in both Joyce's and Einstein's lives.

Einstein began taking violin lessons at a very young age. He loved playing Mozart sonatas for violin and piano with his mother, a pianist. During college preparatory school at Aarau in his late teens, he was chosen to play first violin in a Bach piece. The second violinist asked Einstein: "Do you count the beats?" and Einstein replied, "Heavens no, it's in my blood." To him, musical performance was innate, outside of prescribed rhythms or notes on a page (qtd. in Isaacson 29). Later on, when he had to make a speech to a physics department in Prague in the early 1920s, he said, "It will perhaps be pleasanter and more understandable if instead of making a speech I play a piece for you on the violin." He proceeded to perform a sonata by Mozart. (qtd. in Isaacson 272). He would often say that if he hadn't become a physicist, he would have been a musician; words and language paled in comparison to the meaning music could offer. After a performance in New York during his professorship at Princeton in his later years, Time Magazine reported that "he became so absorbed in the music that with a far-away look he was still plucking at the strings when the performance was all over" (qtd. in Isaacson 430).

Like Einstein, Joyce seriously considered a career in music. From a young age, he sang and played piano for family and friends. For a brief period of his youth, he trained his voice intensively and toyed with the idea of becoming a singer. A tenor with a "clarion clear" voice, according to his roommate at the time Oliver St. Gogarty, Joyce participated in the Irish National Song Festival in 1903 and won third place ("James Joyce as Tenor"). Gogarty writes that Joyce might have won first place if not for his dislike of sight-reading musical notes on the spot—which might tell us something about his resistance to thinking of music as meaning derived from prescribed form, as opposed to meaning that comes into life anew with each performance. During this time, Joyce also loved to sing old English ballads—many of which would materialize in Stephen, Leopold Bloom, and Molly Bloom's thoughts throughout *Ulysses*.

But a deeper look at what Einstein and Joyce loved about the "play" of music reflects on the differences between literature and science. Einstein loved Mozart's music because it seemed "so pure and beautiful that I see it as a reflection of the inner beauty of the universe itself." To his son Hans Albert, he described further: "Of course, like all great beauty, his music was pure simplicity" (qtd. in Isaacson 14). According to Hans Albert, whenever Einstein "faced a difficult challenge in his work, he would take refuge in music and that would solve all his difficulties" (qtd. in 14). He would play Mozart sonatas late into the night, wrote his friend Peter Bucky, and "then, suddenly, in the middle of playing, he would announce excitedly, 'I've got it!' As if by inspiration, the answer to the problem would have come to him in the midst of music" (Bucky 148). In contrast, he felt "uncomfortable" listening to Beethoven, the Romantic composer: "I think he is too personal, almost naked" (qtd. in Isaacson 212). His awe of Mozart's classical music was its ability to convey infinite meanings through a simple, universal architecture (as most of Mozart's sonatas follow almost exactly the same structural pattern). It reflected his belief in the underlying simplicity of the universe, the belief in the few crowning concepts atop the card house that could explain all of the fragmented sensory experience.

Joyce, however, found meaning in music as he found it in "drama": through resonance as a "personal woe." In the 'Sirens' chapter of *Ulysse*s, as in 'Proteus,' we can see how climactic onomatopoeic in(ter)ventions seem to contain the most meaning for the characters. During the episode, musical sounds fill the Ormond Hotel, where Stephen's father Simon Dedalus sings and plays the piano as Leopold Bloom ponders both the experiential and architectural aspects of music. As Bloom hears Dedalus sing, he imagines that the note "soared, a bird, it held its flight, a swift pure cry, soar silver orb it leaped serene, speeding sustained to come…everywhere all soaring all around about the all, the endlessnessnessness…" (264). This out-of-body experience seems to echo Stephen's "wayawayawayawayawayaway," as Bloom too describes his the inexplicable meaning of that moment of clarity with an onomatopoeia outside of the Symbolic order.

However, because Blazes Boylan, Molly's lover of the afternoon, is also a tenor like Dedalus, Bloom's appreciation for the music is punctuated throughout the episode by the reality of his wife's affair. 'Sirens' strikes a chord with 'Penelope' because it is the episode when the explicit sexual act that Molly later graphically expounds for us "happens" in the timeline of the novel's events. On the one hand, music as "plaintive woe" inspires compassion and tenderness in Bloom (261); on the other hand, the phallic Boylan and the "throb, a throb, a pulsing proud erect" (263) of mathematical form makes Bloom remember that "numbers it is. All music when you come to think…Vibrations : chords are…musemathematics," (267). As it did for Joyce, the architectural part of music seems only to detract from its essence as infinite meaning for Bloom.

While one could write a whole book on the musical connections between Joyce and Einstein, my goal with this brief interlude is to describe how the *experience* of music evokes two seemingly antithetical tenets: the scientist's belief in an architecture in the universe and the writer's belief that the greatest art resonates as a "personal woe." Despite their differences, both Joyce and Einstein identified with the power of the infinite—even contradictory—experiential meanings in music. In an interview with George Borach in August 1917, Joyce explained his fascination with Ulysses' encounter with the Sirens: "Ulysses is also a great musician; he wishes to and must listen; he has himself tied to the mast. The motif of the artist, who will lay down his life rather than renounce his interest" (qtd. in Ellmann 430). Einstein and Joyce both "laid down their lives" for science and art and sought to create works that would be as encompassing in form and matter as music: Einstein, through a repudiation of the personal ties in his life, and Joyce through a headlong dive into the personal, blurring the boundaries between fact and fiction by subsuming his family, friends and intimately personal experiences into his works.

Laying down life (i.e. repudiating the "reality" of the Symbolic order) for an alternate, pleasurable, but perhaps dangerous experience of meaning coincides with the conflict each of these thinkers faced in their pursuits of "wonder" and "drama," analogous to Lacan's Real. One of Lacan's last seminars was entirely inspired by his study of Joyce's last novel, *Finnegans*

Wake, as mentioned in the prelude. In the seminar, Lacan discussed the concept of *le sinthome*, an "old way of writing what was later a written symptom," according to Lacan. While in traditional psychoanalysis, Freud had theorized that the symptom was a "a sign of, and a substitute for, an instinctual satisfaction which has remained in abeyance [as a] consequence of…repression", Lacan studied Joyce and found that symptoms need not be uncontrollable manifestations that always must appear in the conventional prescriptions of the Symbolic order (as a symptom of a disease must appear in a medical textbook for a doctor to diagnose the patient) (Freud 91). Lacan found that Joyce volitionally seemed to allow the Real to reshape the Imaginary, as "one creates a language inasmuch as at every instant one gives it a meaning, one gives it a little prod, without which it would not be living" (qtd. in Brivic 16). Here, Lacan seems to elucidate how the Real might influence the Symbolic Order—something which remains unclear throughout his earlier seminars—and he thus looks forward to Judith Butler's notion of performativity, that speech acts can create anew. "Why shouldn't we invent a new signifier? For instance, a signifier that would have no sense at all, just like the Real?" asked Lacan (qtd. in Verhaeghe and Declercq 15). Lacan found that Joyce's word-play enabled him to "break through into a new imaginary founding meaning" (qtd. in Brivic, 122). As meaning comes when the Symbolic corresponds to the Imaginary (as when "I" corresponds to a supposed whole), Joyce's allowing the Real to reshape the Imaginary—through, for example, those onomatopoeic, musical experiences—served as gateways to alternate Realities.

Joyce's and Einstein's symptoms were that they realized language does not approach a Real meaning. Over and over again, as mentioned throughout the previous chapters, they identify lacks in concepts. Lacan theorized that one makes a symptom a sinthome by volitionally using it: "To know how to handle, to take care of, to manipulate…to know what to do with the symptom, that is the end of analysis." (qtd. in Verhaeghe and Declercq 65). That, to Lacan, was the "cure" to the lacking nature of reality, the bar between phallic knowledge and the Real.

I follow Paul Verhaeghe, Frédéric Declercq, and Shelley Brivic, well-known Lacanian theorists, in proposing that Lacan's sinthome is inextricably related to the knowledge one can only experience. Because le sinthome, the deliberate transformation of a symptom, flouts the symbolic order, it gives access to that space where women ex-sist outside of conventional language and discourse. Lacan theorized that there was another jouissance apart from the eternally unsatisfactory phallic jouissance that was thus accessible most conveniently to women: the jouissance of the Other. Where language—the Other—itself is barred, unable to signify, lies the jouissance of the Other, an ineffable pleasure of experience. As knowledge that does not belong to the Symbolic order of reality, it is the opposite of learned book knowledge; it is experiential knowledge. Lacan likens this jouissance of the Other to theological ideas of enlightenment, a state one cannot describe or understand except through experience: "Doesn't this jouissance one experiences and yet knows nothing about put us on the path of ex-sistence? And why not interpret one face of the Other, the God face, as based on feminine jouissance?" (*Seminar XX* 77). As opposed to the ever-slipping, ever lacking phallic jouissance, the jouissance of the Other is Real, eschewing wholes and aiming for the "infinite," as Lacan said in his seminar on feminine sexuality. As I discuss simultaneity in the next section, we will further see how Einstein and Joyce must engage the silence of women, that which occupies the lack in the Symbolic order, in order to experience this jouissance of the Other.

For the rest of this chapter, we explore how Einstein and Joyce approach the Real by flouting the Symbolic order "sinthomatically." Einstein volitionally slips underneath the signifier by inhabiting the visual Imaginaries of multiple observers at once, thus engaging in "image-play," and Joyce volitionally slips under phallic signifiers through word-play. After discussing their experiential approaches toward concepts, we explore their ultimate rejection of reality through their uses of the thought experiment. Their play, like music, offers new and alternate Realities.

Simultaneity Matters

Of the five papers Einstein published in 1905, the two that overturned classical mechanics and led to the development of quantum theory were "On the Electrodynamics of Moving Bodies," which posited special relativity by way of debunking the concept of simultaneity, and "Concerning an Heuristic Point of View Toward the Emission and Transformation of Light," which theorized that light consisted of light-quanta, or discrete energy particles. While the former asks us to redefine time as a subjective rather than absolute entity in order for the laws of physics to be generalizable to observers traveling at different speeds, the latter asks us to think of light as simultaneously having the wavelike and particle-like characteristics. In a strange way, the breakdown of an absolute time that would permit the occurrence of simultaneous events for all freely moving observers went hand in hand with a theory of matter that permitted the simultaneity of substance—wave and particle.

While we have seen how Joyce uses nonsense, silences and word play to access the cracks in the Symbolic order, Einstein, as noted earlier, manipulates the realm of the Imaginary instead, thinking in "memory-pictures" as opposed to words.[14] In real life, the mental images we form from seeing with our eyes are necessarily from the point of view of one observer, oneself; however, Einstein was able to slip between the perspectives of different observers simultaneously in his thought world. In an interview with famed Gestalt psychologist Max Wertheimer, Einstein described the thought experiment that began his interest in light. When he was a 16-year-old student at the Gymnasium in Aarau, he found himself puzzled by the nature of light: "What if one were to run after a ray of light? What if one were riding on the beam? If one were to run after a ray of light as it travels, would its velocity thereby be decreased? If one were to run fast enough, would it no longer move at all?" (169). Einstein's ability to imagine situations outside of the boundaries circumscribed by "reality" stemmed from memory-pictures that called upon the

[14] As quoted earlier in Einstein's letter to Jacques Hadamard and his "Autobiographical Notes."

absurd. In this particular experiment, he wonders whether riding on a light beam alongside another would be comparable to riding a boat at the same speed as a wave right next to it. To the boater, the wave would appear to be still, as both the boat and the wave are traveling at the same speed. But Einstein, having deeply studied Maxwell's equations, which show that an electromagnetic wave can never stand still, had the intuitive hunch that a rider on a light beam would not be able to look over and see a standing electromagnetic wave; light would still look like light and appear to be traveling at the same speed, regardless of how fast an observer were traveling. So began Einstein's preoccupation with the Real nature of light—at once, informed by existing knowledge of mathematics, but also enhanced by a "wonder"ing beyond mathematical and linguistic vocabulary.

In Einstein's popular exposition *Relativity: The Special and General Theories*, he systematically shows how he investigated light, the classical laws of motion and simultaneity in search of a higher layer of conceptual coherence. Einstein first asks us to imagine a railway embankment and a ray of light propagating alongside it—the light ray traveling at 3×10^8 m/s and the train at much slower velocity.[15] According to Galileo's principle of relativity, in order to find the speed of the light ray with respect to the traveling train, we would need to subtract the train's velocity from that of the light ray. But that, Einstein says, seems to run against our understanding that light *always* looks the same, whether from a traveling train or from the stationary embankment. Either the principle of relativity or the nature of light's movement had to be reformed.

At this point, it would have been easy for Einstein to choose to re-theorize the mysterious phenomenon of light, still at the edge of scientific understanding, rather than the Galilean principle of relativity, visible and observable in our day-to-day experience of motion. Einstein too played with the possibility that the "constancy of the velocity of light in a vacuum…had to be

[15] Whenever I say "speed of light," I refer to the speed of light in a vacuum, which amounts to 186,282 miles per second or 299,792,458 meters per second.

given up." But after "years of groping," he was able to notice a lack in the already-existent and already-theorized conceptual system, "that the difficulty lay in the arbitrariness of basic kinematical concepts" ("Fundamental Ideas and Methods of the Theory of Relativity, Presented in Their Development," CPAE 7: 135). What led to Einstein's shift in thinking from the frontiers of physics (investigating the cosmic light) to the hole in science (the principle of relativity)? Roughly translated into Lacanian terms, how did he shift his focus from a phallic jouissance, aimed at edges of thought, to the Real, that lack which is inaccessible in extant symbolic knowledge?

We must first credit useful advances from other physicists that led to his turn of thinking. In 1887, Albert Michelson and Edward Morley cast doubt upon the existence of the ¨luminiferous ether¨ through a carefully-undertaken experiment to observe ether´s properties. They sent out two light rays at right angles to each other, one against the ¨ether wind¨ that would blow counter to the direction of the earth´s rotation and the other traveling perpendicular to the ¨wind¨ that would hypothetically travel faster than the ¨downwind¨ ray. The result of their experiment was that both light rays were measured at the same speed, 3×10^8 m/s, despite one going directly against the ¨wind¨ and the other merely traveling upwards. Classical mechanics´ law of addition of velocities—that, for example, a ship would travel faster with the wind aiding its direction of motion and slower against an opposing wind—did not seem to apply to light. The Dutch physicist Henrik A. Lorentz followed this experiment by proposing a mathematical hypothesis to corroborate Michelson and Morley's findings: that the length of the measuring apparatus contracted in the direction of the earth's motion, which compensated for the lack of impact of the earth's motion on light's speed. But Einstein wasn't satisfied with this "ad hoc" hypothesis (Wertheimer 173).

"I suspected that Lorentz's ideas had to be modified somehow, but spent almost a year on fruitless thoughts," he said in a later speech. Finally, it seemed apparent to him that "time cannot be absolutely defined by itself, and there is an unbreakable connection between time and signal

velocity" (qtd. in Norton, "Einstein's Pathway to Special Relativity"). Here, he makes the connection that time is defined by a measuring apparatus, the signal velocity of light. As Einstein wrote in his paper on special relativity, "We have to take into account that all our judgments in which time plays a part are always judgments of *simultaneous events*. If, for instance, I say, ``That train arrives here at 7 o'clock," I mean something like this: ``The pointing of the small hand of my watch to 7 and the arrival of the train are simultaneous events" ("On the Electrodynamics of Moving Bodies" 175). His ability to connect the underlying impulses (light signal) that led to corresponding mental images of simultaneity (the hand on the clock corresponding with the train's arrival) led him to realize that underneath the hegemonic concept of "absolute time" lie disparate "memory-pictures" in the Imaginary that humans mistakenly correspond to form a false whole of experience: absolute time across the expanse of space. Understanding that time was the derived concept as opposed to light, Einstein chose to retain the constancy of the speed of light in vacuums regardless of the speed of its emitting source in his paper. Instead, he decided to revise the foundational Galilean principle of relativity—the lack within the reality offered by classical mechanics—to approach the Real of time.

In the 1905 paper, he considers a thought experiment that he later expounds upon in his popular exposition *Relativity: The Special and General Theories*. Einstein asks the reader to imagine two lightning strokes occurring "simultaneously" on a railway embankment at points A and B, very far from one another (see Fig. 5). By "simultaneous," Einstein means that the light rays from A and B meet each other at M, the midpoint between them, at the exact same instant according to an observer at M. At the same time, there are points A and B that correspond to a freely moving train traveling past the embankment to the right. If the train had stalled for a moment, an observer at

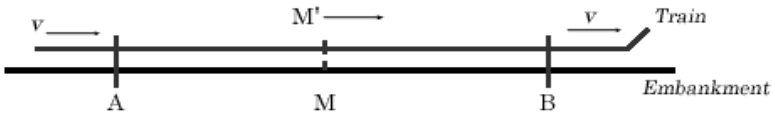

Fig. 5: Einstein's diagram depicting an observer on the moving train (M') and one on the embankment (M). From Albert Einstein, *Relativity: The Special and General Theory* (Methuen & Co, 1916; Project Gutenberg, 2004) 18. Web, 18 Oct. 2011.

the midpoint M' sitting on the train would have perceived the flashes at A and B to occur at the same time as seen by the observer on the embankment at M. But because the train is moving toward B, the light from B reaches the observer at M' on the train sooner than the light from A (and as we know, the speed of light is constant: so in *d=rt*, a constant rate *(r)* implies inconsistent time (*t)* and distance *(d)*). So the observer on the train, taking the train as his "reference body," perceives the flash from B to have happened before A. Thus, "events which are simultaneous with reference to the embankment are not simultaneous with respect to the train, and vice versa," Einstein writes. Each body of reference has its own time, and there is no privileged absolute frame of reference from which a synchronized time can be set. Time in classical mechanics had functioned independently of the "state of motion of the body of reference," but by slipping underneath this concept by inhabiting the "memory-pictures" (the Imaginary) of two hypothetical observers at the same moment, Einstein was able to access an experience of the fragmented Real of time (*Relativity: The Special and General Theory* 27).

With this new understanding of light, Lorentz's discovery of "length contraction" proved correct and oddly, special relativity also showed that clocks tick slower at increased speeds. Imagine a clock on a train that has a light flashing every second from a mirror on the floor of the train to a mirror fixed directly above the other one, on the ceiling of the train. If the train is traveling at a very fast speed to the right of an observer standing on the embankment, the light beam seems to travel diagonally rather than vertically: the light starts at the bottom, but by the time it reaches the ceiling, the train has moved forward slightly, and by the time it reaches the floor, the train has moved forward slightly again. The diagonal distance the light has to travel means it takes a longer time to get from the floor to the ceiling and back. Though the speed of light is the same for the observer on the embankment and the rider on the train, since the standing observer perceives the light to travel a longer distance, the time on the train seems to go slower than his time (but to the rider, time seems to tick on as normal, since the light travels a vertical path with respect to her). Similarly, since we measure lengths by putting a rod of known length

next to another object *at the same time*, for a train traveling at a fast speed, time ticks differently and an observer riding the train would find a longer measurement than an observer with a ruler on the embankment (Isaacson 129). Special relativity thus showed that both time and space were no longer absolute.

Relativity thereby foregrounds the Lacanian subject's position in the Symbolic order of the absolute frame of reference; a concept like "simultaneity" was lacking as long as it only applied to one privileged frame of reference. But Einstein believed the laws of physics—and thereby knowledge—were incomplete as long as they remained inapproachable from any frame of reference. His affinity for the thought experiment shows his belief in generalizable knowledge, not restricted to one frame of reference like science. This universality also correlates to the creation of public knowledge, as thought experiments allow the reader to *experience* the gap in current laws and *visualize* the fragmented nature of experience underlying unifying language like "time." Einstein's numerous public writings and subsequent re-explorations and elaborations on the original thought experiment of special relativity show his commitment to creating and maintaining this public knowledge. To summarize, Einstein's solution to his own "barred" existence in the laws and language of classical physics—the symptoms of which were the concepts of "ether," "absolute time," and "absolute space"—was to slip "sinthomatically" between "memory-pictures" of different frames of reference and imagine being in the shoes of different observers at once. The gap in between—the same "lack" he found in the absolute frame of ether—gave him, and subsequently his readers, a glimpse of the "not-whole" nature of time and space: the Real.

It is this slippage that corresponds to Joyce's conception of simultaneity in 'Penelope,' the celebrated last episode of *Ulysses* when Leopold Bloom's wife Molly speaks her thoughts about the day (before, we only hear from male narrators). The elaborate schema of the novel that Joyce provided to his friend Stuart Gilbert (the first literary critic to take on the task of analyzing *Ulysses)* denotes a corresponding hour of the day for each episode of the novel, as the novel takes

place over the course of one day. However, for 'Penelope,' the column for "time of day" is denoted with a mere dash (Johnson, "Appendix A" 775). Furthermore, Joyce sent a letter to his editor Harriet Shaw Weaver informing her that "'Penelope' has no beginning, middle or end" (qtd. in Lawrence 203). We can thus approach the episode as a rejection of absolute time or space: it is not part of Mr. Deasy's idea of history as telos, nor is it part of the *Nebeneinander* of the visual art and space that begs for delineated boundaries.

In Molly's mind, time seems to take on a secondary significance relative to the sheer whirl of memory. Through the way the signifier "he" slips in the middle of a sentence to different "signifieds" of males in her life, we can see the way a moment or event for Molly is only significant in its historical context, not as a datum in a timeline of her life. We can see the slipping of the "he" signifier when she discusses the different fetishes of her lovers—Boylan's affinity for the "shape of [her] foot" and Bloom's obsession with female undergarments. As she discusses the way parts of her body excite them, the "he's" become confused: "I saw him [Boylan] looking with his two old maids of sisters when I stood up and asked the girl where it was what do I care with it dropping out of me and that black closed breeches he [Bloom] made me buy…" (696). From the moment where Boylan talks to her about the "shape of her foot" earlier in the day, we are transported to a different moment when she was at a restaurant with Bloom, wearing her special underwear that her husband had bought her (and needing to urinate). Molly cannot separate the event of her sexual encounter with Boylan earlier in the day from her personal history dealing with men's fetishes, which began with Bloom. Later in the same sentence, the "he" switches over to refer to Bartell dArcy, another one of her lovers whom she used to sing with, but then switches back to Bloom as she fantasizes about the future: "he [Bartell dArcy] said wasn't it terrible to do that there in a place like that I don't see anything so terrible about it Ill tell him [Bloom] about that some day not now and surprise him ay and Ill take him there and show him the very place too…" (697). Here we can clearly see the link between Lacan's idea of the phallic signifier ever slipping among signifieds, unable to satisfy desire.

Molly sees the lack in the male pronouns and understands them as symptoms of existence in reality. By ignoring the fixedness of the male pronoun (as Einstein ignored the fixed nature of "absolute time" and "absolute frame of reference"), Molly/Joyce makes the symptom a sinthome and slips meaning under the signifier volitionally as s/he transitions from a past memory into a future moment, all the while thinking in the present, lying in her bed next to Bloom.

In Lacanian terms, as "woman," Molly is not bound by the symbolic conventions of clocks and times. Correspondingly, Joyce characterizes her monologue as separate from the rest of the novel: he wrote to Weaver that 'Ithaca,' the second-to-last episode, was "in reality the end." The ex-sistence of 'Penelope' is Joyce's solution for Molly's exclusion from the other episodes, which constitute the narrative sequence and offer male frames of reference for the events in the day. Through the eight long sentences that comprise 'Penelope," each running on seemingly endlessly through events and places, Joyce allows Molly to inhabit the entire novel at once, reveal new insights about the events of the day, and revise the personal histories of Bloom and Stephen that we learned through their respective interior monologues. She refuses to distinguish between past, present, future, or even the men she has sex with, as the signifiers of male pronouns seem like empty shells that point to a sliding chain of signifieds, Bloom, Blazes Boylan, Gardner Lieut. Stanley G., Bartell dArcy, and Stephen. As opposed to thinking of each "he" or "him" as an absolute point on her timeline, she thinks of the signified males as part of each other's historical intersections with herself via the phallic signifier she uses to generalize them all (indeed, none seem worthy of being the sole inhabitant of the "he," as all lack in some way).

Similarly, Einstein's special relativity showed that no event could be indicated by definite time coordinates because time is necessarily different from observer to observer; it is only by using the Lorentz transformation that we can understand "when" an event occurred on another freely moving observer's timeline. Both Joyce's and Einstein's goals were the same: not to privilege one frame of reference over another. While Einstein established this goal by instead

elevating light to the absolute constant upon which ideas of time and space can be based and transformed to fit each observer's frame of reference, Joyce simply allows for each observer to posit his or her own perspective on the occurrences of time, space and history. Here, we can see the difference between the approach of science and that of literature: the discipline of science calls for a "poverty of concepts" that can create the greatest amount of unity in coherence with the physically real, while the discipline of literature, by its very understanding of its own fictional nature, can be content with a conflicting multiplicity of concepts and ideas describing the same "simultaneous" events, leaving us to question the meaning of the "physically real" in the first place.

But there's a second simultaneity embedded in Einstein's 1905 papers, one we discussed in the first chapter: the simultaneous wave-particle existence of light. While one major breakthrough of Einstein's "miracle year" was the derailing of simultaneity with regard to absolute time, another was to introduce the idea of simultaneity in matter. By doing so, Einstein calls attention to the way light, in a sense, is bounded and has no boundaries all at once. Or, in his words at his 1909 talk in Salzburg: "These two structural properties simultaneously displayed by radiation should not be considered as mutually incompatible" (qtd. Isaacson, 156). One can investigate light's particulate nature by observing the electrons emitted by photons during the photoelectric effect, or one can choose to observe the way it acts as a wave and diffracts into bands of dark and light, as Thomas Young demonstrated in his famous double-slit experiment. But as one of the primary paradoxes of quantum mechanics, it is impossible to experimentally show its wave and particulate nature at once: one must resign to separate experiments that show one or the other, depending on what one is looking for in the first place. Wave and particle, while meant to represent the binary of continuity versus discontinuity, end up signifying the same thing: light, a boundary-less phenomenon, unsignifiable like the Real.

We can see how Einstein's revolutionary positing of wave-particle duality leads his thought over the years to a boundary-less merging of space and time. In his 1905 paper

"Concerning an Heuristic Point of View Toward the Emission and Transformation of Light," Einstein makes it clear that he is *not* positing that light *solely* consists of quantum particles; he gives due credit to the wave theory's ability to describe "purely optical phenomena" like refraction and diffraction. However, he says the optical observations "refer to time averages rather than instantaneous values" (178). Just as a line is composed of infinite points, electromagnetic waves can be described as both a continuous entity and one that contains discrete differential points that can be studied individually, he writes. His description hearkens back to Stephen's conception of *Nebeneinander*, art and space that we perceive as wholes, versus *Nacheinander*, time and poetry's ability to provide for a differential experience. Bringing light quanta into discourse, Einstein opened the door for positing that time and space are interrelated, as even wholes in perception that light illuminates can be broken down into discrete parts and studied differentially (exemplified by the photoelectric effect). As the fastest instrument of observation in the universe, the signal velocity of light determines both the representation of time on a clock and the length of a rod in space.

In Einstein's effort to generalize the findings of special relativity to observers who are not restricted to Galilean "inertial reference frames" (fictional coordinate systems from classical mechanics that require that observers are moving at constant velocities relative to one another, without acceleration or deceleration, in a uniformly straight line), he came to the understand that space and time were melded together in a four-dimensional continuum called "space-time." This concept would later form the basis of his general theory of relativity. But crucial to this radically new conceptualization of the universe was his investigation of the way gravity and acceleration are related. "I was sitting in a chair in the patent office at Bern when all of a sudden a thought occurred to me," he later recalled. "If a person falls freely, he will not feel his own weight." The insight "startled" him, as it allowed a way into generalizing special relativity to incorporate gravity. He would later call the moment the "happiest thought in my life" ("Fundamental Ideas and Methods of the Theory of Relativity, Presented in Their Development," CPAE 7: 136).

What path did this "wonder" take him that eventually led to the construction of space-time? Einstein imagined a man in an enclosed box "far removed from stars and other appreciable masses." Gravitation would not naturally exist for him, as he is floating deep in space. But then a rope is hooked at the top of the box and a giant from the outside begins pulling it at uniformly accelerated motion, causing the man to become pressed to the floor. "He is then standing in the chest in exactly the same way as anyone stands in a room of a house on our earth…The man in the chamber will thus come to the conclusion that he and the chest are in a gravitational field. Just then, however, he discovers the hook in the middle of the lid of the chest and the rope which is attached to it, and he consequently comes to the conclusion that the chamber is suspended at rest in the gravitational field" (*Relativity: The Special and General Theory* 42-44).

Because of this "equivalence principle," which Einstein created to show that the observer would not be able to tell the difference between his mass in a gravitational field pulling him down toward the floor of the box or his inertial mass (the force required for the giant to pull the box along), Einstein also came to theorize that light bends in gravitational fields. If a light beam shines through a small hole on one side of the box, the man in the chamber would perceive that it hits the opposite side at a slightly lower point, as the giant is continually pulling him upward. The observer would come to assume that light beams curve in gravitational fields. Because Einstein was dedicated to generalizing the laws of physics for every observer, this observer's understanding should not be dismissed, but accounted for.

Further evidence for the bending of light came from Einstein's most famous 1905 discovery known by its mathematical formulation as $E=mc^2$, which showed that "the mass of a body is a measure of its energy-content" ("Does the Inertia of a Body Depend on its Energy-Content" 3). In terms of light, that means that each quantized particle, or photon, though weightless at rest, carries an enormous amount of energy due to its traveling at the speed of light—and thus, acts as if it has mass in a gravitational field (Russell 234). As light passes by large bodies like the sun, it essentially illuminates the curves in space-time made by the massive

body by traveling in a "curvilinear" route, attracted by the sun's gravity, as opposed to "rectilinear," in a straight line (*Relativity: The Special and General Theory* 47). Since both the measure of distance and time depend on the perspective of the observer seeing a signal velocity (flash of light), Einstein conceptualized the fabric of space-time to be composed of "events" that take into account time and space and are illuminated by "light cones" of possibility. Gravity, rather than a master force that acts instantaneously between bodies, is embedded into the structure of space-time by large masses curving the fabric. As physicist Brian Green put it:

> Space and time become players in the evolving cosmos. They come alive. Matter here causes space to warp there, which causes matter over here to move, which causes space way over there to warp even more, and so on. General relativity provides the choreography for an entwined cosmic dance of space, time, matter, and energy. (qtd. in Isaacson 220)

With the equivalence of mass and energy, the positing of light quanta, and Einstein's steady work toward unifying gravity with special relativity, there was a sense among the physics community in the early 1900s that Einstein's papers were at once revolutionary, at once impertinent. Arnold Sommerfeld and later Lorentz remarked that there was something "Jewish" about the papers because of their lack of "due respect for the notion of order and absolutes" (qtd. in Isaacson 142). Lorentz wrote in 1907, "As remarkable as Einstein's papers are, it still seems to me that something almost unhealthy lies in this unconstruable and impossible to visualize dogma. An Englishman would hardly have given us this theory. It might be here too, as in the case of Cohn, the abstract conceptual character of the Semite expresses itself" (142). German physicists who sympathized with the Nazis would later echo their comments ominously as they condemned Einstein's "Jewish physics". In a strange twist, Einstein's ability to go beyond the delineated boundaries of words such as "light," "matter," "time," and "space" to demonstrate their multiplicity and nuance of meaning made him "Jewish"—and also less of a man.

It was this very boundary-defying perception of Jews, the eternal wanderers, that led Joyce to make Leopold Bloom a Jew. We will later explore his position as a "womanly man" as it

relates to defying patriarchal ideals in the 'Circe' episode. Einstein too, after the destruction wrought by World War II, resisted the idea of a "Jewish state with borders, an army and a measure of temporal power," because he felt that the "return to a nation in the political sense of the word would be equivalent to turning away from the spiritualization of [the Jewish] community" (*Out of My Later Years* 263-264). He contrasted the Jewish people as a "small minority everywhere, with no means of defending themselves by force…exposed to the cruelest suffering, even to complete annihilation," with the "rude passions of man" that "reign our world"—namely, militarism, Nazism and nationalism (261). Disregard for "order," "absolutes," and boundaries, to Einstein and to veterans of his field during his time, associated Einstein with those excluded from the discourses of manliness and patriarchal power. In short, many of his ideas seemed to ex-sist like his conception of Jews and Lacan's idea of women, outside of the Symbolic order rather than phallically inscribed, because of Einstein's method of allowing the Real of "wonder" free play.

In 'Penelope,' we can see the way that the same ideas of matter's simultaneity—the merging of woman and man—throw off ideas of space and time. Joyce, in a letter to his friend Frank Budgen, described the episode in terms that show an androgynous, boundary-defying existence:

> Penelope is the *clou* of the book. The first sentence contains 2,500 words. There are eight sentences in the episode. It begins and ends with the female word *yes*. It turns like the huge earth ball slowly surely and evenly round and round spinning, its four cardinal points being the female breasts, arse, womb and cunt expressed by the words *because*, *bottom* (in all senses bottom button, bottom of the class, bottom of the sea, bottom of his heart), *woman*, *yes*. Though probably more obscene than any preceding episode it seems to me to be perfectly sane full amoral fertilisable untrustworthy engaging shrewd limited prudent indifferent *Weib*. *Ich bin der Fleisch das stets bejaht*.' [Woman. I am the flesh that always affirms.][16] (*Selected Letters* 285)

Christine Van Boheemen-Saaf, an important psychoanalytic and Joycean scholar, makes the astute observation that *clou* in French can mean "star," like an astral body, or "nail" of the

[16] Letter from Joyce to Frank Budgen on Aug. 16, 1921.

text, and the verb *clouer* means "'fixing with a pointed instrument,' such as a dagger (or a pen), and reducing to silence" (141). On the one hand, critics such as Van Boheemen-Saaf portray the entire episode as a borderline-pornographic exhibition of female sexuality, but on the other hand, Joyce uses a French term for a phallic "pointed instrument" or "nail" (*clou)* to denote the episode's importance for "holding together" the work as a whole. His association of the word "yes" with the "cunt" is particularly interesting: as related to the cunt, a *yes* is an orgasmic affirmation of the phallus seemingly filling the hole of the vagina. However, Joyce describes it as a "female word." Strangely, while the yes signifies phallic pleasure, it is also endowed with an underlying female agency capable of ex-sisting outside of phallic discourse, in the realm of Lacan's Real. Further confusing genders, Joyce accidentally genders the word *Fleisch* or "flesh" as masculine, when it should in fact be neuter in German, as Van Boheemen-Saaf points out (141). As "the (masculine) flesh that always affirms," woman becomes associated with the male flesh—the penis—and the signifier yes, both of which fulfill phallic roles of filling the lack that is the "cunt." But as Lacan points out, this lack is one that can never be filled: the phallic jouissance is a sham, one that never brings about true fulfillment.

The implicit androgynous duality of the simple signifier "yes" recalls Einstein's belief that a quantum is not a mere discrete particle, but a packet of energy that is at once particle and wave, the two measurable binaries by which we can describe an underlying indeterminate substance we call light.[17] While the most common view held by physicists even today is that light exists only as wave *or* particle—the so-called Copenhagen interpretation, which we will discuss in detail in the next section—Einstein felt that there could be a theory that does not consider the two observed existences as "mutually incompatible." To him, something Real and indeterminate lay underneath our understanding. Similarly, one can choose to observe the yes's in 'Penelope' as

[17] As mentioned before, Bohr and Barad would say that light only exists as wave *or* particle, and it must be defined with an explanation of our measuring apparatus. Einstein, however, felt that these two existences of light should not be considered "mutually incompatible." To him, a Real nature lay underneath—an indeterminacy.

affirmations only, as did Derrida[18], but one can also find that the "cardinal points" create bands of interference: "no's" interspersed with the "yes's," womb with phallus, woman with man. Many critics have interpreted the "yes" at the discrete, quantized, face value of Joyce's letter, using it variously to describe the purely female, the affirmation of the woman's version of history, the orgasm, the sign of subservience to the man, and a pornographic fetishizing. But in an Einsteinian sense, I think it is useful to see the implicit no's throughout the episode that directly contrast the perhaps commodified female sexuality portrayed by the emphasis on the "yes." As Van Boheemen-Saaf puts it, "the functional presence of the feminine in the text of the masculine author engenders an oscillating blurring of the binaries of inside-outside, self and other, which at once comprehends and incorporates the other and disrupts the possibility of defining either self or other as self-identical" (134). This "oscillation" is comparable to Einstein's view on wave-particle duality: the sign serves as a discrete incarnation of an indeterminate, Real substance that is forever oscillating somewhere in between discreteness and continuity, like the nature of light.

Molly's first "no" is to Homer's description of Penelope, the faithful wife of Ulysses who waited twenty years without remarrying for her husband to return home. Instead, Molly entertains suitors in a manner that makes men reducible to one term in an infinite series of sexual encounters, as Bloom imagines in the preceding episode, 'Ithaca'. We can begin to see the "no's" in Molly's thoughts from her first descriptions of Bloom's infidelities. Molly deduces that "yes he came somewhere Im sure by his appetite" because he requests to get breakfast in bed the next day (691). The savage "yes" of acknowledging her husband's lasciviousness is reiterated later as she juxtaposes his use of writing and language to embark on his sexcapades: "if they only knew him

[18] Jacques Derrida, the iconic deconstructionist who was greatly influenced by Lacan, counted the yeses in *Ulysses* and found "more than 222 in all, of which more than a quarter, at least 79, are in Molly's so-called monologue" (qtd. in Roughley 84). The affirmation of *Ulysses* "demands *a prior* confirmation, repetition, safekeeping, and the memory of the *yes*," Derrida argues, going on to point out numerous other implied yeses in the novel. Alan Roughley notes that Derrida thus shows the primacy of the **sign** yes, in all its different iterations, over the contextualizing of it as either "one-sidedly womanly woman" as Molly or "one-sidedly masculine" as the manifestation of Joyce. Derrida thus misses the boundary-defying androgyny I explore in this section. (See Roughley, *Reading Derrida Reading Joyce* 84-90: refers to Derrida's lecture "Ulysses Gramophone: Here Say Yes In Joyce")

as well as I do yes because the day before yesterday he was scribbling something a letter when I came into the front room…and he covered it up with a blotting paper" (691). After associating her husband's weakness for infidelity with the symbolic order of language, she remembers "that slut that Mary"–the maid they used to have whose "long hair" Molly had found on Bloom's coat. "O no thank you not in my house," she remembers thinking as she goes on to describe how she had kicked Mary out. Implicit in the "yeses" of her thoughts on Bloom's infidelities are the empty feelings of jealousy, hurt and feminine anger—which become the "no" that signifies her taking charge and giving Mary her two weeks' notice. Similarly, she juxtaposes an indignant "no" at being treated like a "horse or an ass" with the orgasmic "yes" of her earlier rendezvous with Boylan, because she feels cheapened by the way he slapped her behind (Im not a horse or an ass am I):"no that's no way for him has he no manners nor no refinement nor no nothing in his nature slapping us behind like that on my bottom" (693; 726). The yes, the so-called "feminine word," shows its phallic lack in signification, its inability to "fill" Molly's sexual desire or describe her emotions completely.

The act of affirmation denies something else, just as the act of naming excludes, as Butler and Einstein were acutely aware. Molly (and Joyce) are not keen on affirming or denying: the yes, like the light photon shone through the double slit, can appear on the screen behind as a discrete "yes" or a band of yeses and no's, implying to Einstein and Joyce a deeper, androgynous, and indeterminate signified that either signifier is unable to fully contain (the Real). It is thus within these implicit "no's" that we see larger truths of events earlier in the day: before, we had not heard explicitly about Bloom's dalliance with Mary, nor did we perceive the nuanced feelings Molly had about Boylan's machismo—which Bloom plays up in his thoughts throughout the day. The meanings from these so-called "yeses" diffract retroactively throughout the rest of the novel—not, as Derrida implied, showing a wealth of affirmation, but by illuminating the men's words with a woman's light.

Molly further associates the emptiness of the signifier "yes" with the physical letters that lovers like Bloom have written to her in the past. The letters give her the semblance of wholeness, of phallic jouissance in Lacan's terms, but in the end, leaves her lacking: "they [men] want to do everything too quick take all the pleasure out of it" (698). Just as the phallic jouissance never results in fulfilling the fantasy of wholeness and totality that it represents in Lacanian theory, Molly perceives both the seduction and emptiness of language. She wishes "somebody would write me a loveletter…true or no it fills up your whole day and life always something to think about" and she remembers receiving her first letter from the first boy she ever kissed: "I had it inside my petticoat bodice all day reading it up in every hole and corner" (709, 701). Just as she earlier imagines Boylan's male organ as a "Stallion…driving up into you," these letters give her something to "fill up" her "whole" day, a seemingly unequivocal affirmation. But Molly, understanding the "lack" inherent in all these phallic signifiers, thinks her reply to an imaginary letter she would receive would be "just a few words not those long crossed letters" (709) because its best to "say a few simple words he could twist how he liked" (709). Her preference for an enigmatic silence echoes that of Nora to Joyce in 1909 and shows Molly/Nora's deliberate understanding of how to manipulate her feminine silence.

Even as Molly scorns the letters, and the "big words" that Stephen also fears, she finds herself simultaneously attracted to language as she associates it with phallic jouissance, sexual pleasure. The doctor who treated her "womens disease" seemed to have the power of diagnosing her and introducing new vocabulary to her body like "your vagina," "offensive odour," and "omissions" (720-721). "Where do those old fellows get all the words," she wonders as she imagines him writing out the prescription. Yet "still [Molly] liked him when he sat down to write the thing out frowning so severe his nose intelligent" (721). We can see here how Joyce writes himself not only into Stephen and Bloom, but also Molly: Joyce had aspired to be a doctor for a long time, but dropped out of medical school every attempt, as the "big" medical words did not suit him, failing to accurately contain knowledge of the human. Molly's

enthrallment at being named, acquiring a vocabulary for her body, is coupled with her repulsion at the compartmentalizing of her body into these discrete concepts—which stand in direct contrast to the copious and overflowing nature of her body as Joyce writes it in 'Penelope.'

Scientific conceptualization is seductive, as Einstein too noted: words allow for semblances of greater unity among the fragmented Reality of experience. But also, in contemplating the meaning of the female silence (throughout the non-'Penelope' portion of *Ulysses*, their personal lives, and the curvilinearity of time and space), both thinkers' "wondering" leads them to see the lack in these conceptualizations. Joyce's inadvertent (or deliberate?) characterization of 'Penelope' as both male and female in his letter to Frank Budgen finds voice through Molly. Women, Molly says at one point, are a "dreadful lot of bitches"; yet in another section of her stream of thought she thinks, "itd be much better for the world to be governed by the women in it you wouldn't see women going and killing one another…" (727). Similarly, she realizes her breasts "excite myself sometimes," affirming her attraction to femininity, but she also says she "wouldn't mind being a man to get up on a lovely woman…for a change just to try with that thing they have swelling upon you so hard" (726). Boundaries of words like "woman" are just like the signifier "he"—manmade, symbolic, and referring to a host of different and often paradoxical meanings that Molly challenges and re-informs throughout 'Penelope.' In her search for the words to describe the Real of her thought, she swings between binaries of words, like "yes" and "no," but her very movement of thought implies less of a binary and more of an infinite indeterminacy, a text creating all these oppositions. She neither rejects the male through the "yes" nor affirms him, neither elevates the woman, nor denies feminine power in society. While the repeated occurrence of "he" without a proper name could point to the presence of a patriarchal order or an overpowering God the Father presiding throughout the chapter, Molly's volitional word play, sliding signifieds under the signifier "he," prevents the "he" or the "yes" from crystallizing into singulars *or* binaries of meaning.

In this light, Joyce's characterization of 'Penelope' as the "amplitudinously curvilinear episode" describes more than the topography of her "female breasts, arse, womb and cunt"; the "gravity" of Molly's body, which Joyce describes in the previously-quoted letter as a "huge earth ball," attracts light and delineates the way in which absolute time and space have no meanings as her thoughts flit instantaneously between the fantasies, facts and fictions of memories and the parallels and paradoxes of history (qtd. in Newman and Thornton 302). To her, as to Einstein, "events" in space-time are composed of a history and are unsignifiable in simple terms of hours of the day or coordinates of place (which were among the demarcations Joyce made for structuring the other episodes of the novel[19]).

In short, words lack in meaning—and even the simplest of words, yes, fails to signify completely. Some of Einstein's final written thoughts on physics describe the way quantum signifiers exhibit a similar incompleteness. As he enumerates in his reply to criticisms in *Albert Einstein: Philosopher-Scientist,* his main problem with quantum mechanics was that physicists like Niels Bohr were purporting it to be the most complete description of phenomena possible—and he disagreed. He centers his argument around the signifier of ψ, Schrödinger's wave function, to describe the way it fails to provide a "complete" representation of the state. In the case of a hypothetical radioactive atom that is going to emit a particle at some point in time, Einstein finds fault with the ψ-function because it only describes the probability of the particle being discovered in a *chosen* part of space at a *chosen* instant. "On the other hand, the ψ-function does not imply any assertion *concerning the time instant of the disintegration* of the radioactive atom" (668). The wave function can tell us where something will be at a given time in a given space, but it will not tell us when the radioactive atom actually emits the particle—which, to Einstein, seemed like a huge omission. By picking an arbitrary time to plug into the wave equation, we essentially predetermine the probability wave—when, in fact, that time we picked may not be the exact moment when the atom eventually does emit the radioactive particle.

[19] See Gilbert and Linati Schemata in Johnson, "Appendix A" 775.

In other words, Einstein's problem with the ψ-function is that it can describe an "ideal ensemble of systems," where something is supposed to happen at a certain time, but not a "singular system" (668). He does not argue that the ψ-function has no value; he just believes that there is a more "complete description"—a Realer one—for which "there is no room in the conceptual world of statistical quantum theory" (668). Niels Bohr, in his essay on Einstein's epistemology, notes that Einstein's issue was not with the probability involved in statistical mechanics, which provided a "means of accounting for the properties of mechanical systems of great structural complexity"; rather, Einstein's discomfort lay in the refusal of quantum mechanics to attempt to "comprise the peculiar features of indivisibility, or "individuality,' characterizing the elementary processes" (211). Quantum mechanics rejected even the notion that concepts can describe individual occurrences, like the particular time that the radioactive atom decays. "We are not dealing with an arbitrary renunciation of a more detailed analysis of atomic phenomena, but with a recognition that such an analysis is *in principle* excluded," Bohr wrote, in defense of quantum mechanics (235).

The signifier of the ψ-function, unlike arithmetic numbers, is an arbitrary creation that is meant to represent a quantum state in probabilistic terms. Einstein sees the "lack" in this signifier in that it merely represents what is ideal—where the term ideal points to an instance of human choosing of a particular instant over another. Read from a Lacanian viewpoint, Einstein is concerned about the primacy we give to the human urge to create complete systems of knowledge, wholes, through the symbolic order. Implicit in his concern is the belief that there is, in fact, a real instant when the radioactive particle is emitted—perhaps not measurable through his current scientific means, but still existent and real. But as opposed to his militant attempts to "solve" the paradoxes of quantum theory a few years before, which we will explore in the next section, at the end of his life he seemed once again to mull on the lack rather than propose a complete whole. Einstein desired a signifier that would either admit its own lack or describe all of Reality; however, the "complete" description of the ψ-function—the true meaning of

Schrödinger's probability wave—lies in the Lacanian Real and defies signification, as the Real can never be represented by a signifier that is based on prior knowledge systems and axioms. Importantly, Einstein's distress against the ψ-function seems to go back to Stephen's discomfort with the dog carcass and Molly's fear of the letter. The symbolic order is inadequate for representing the Real of knowledge.

But as we have also seen, the intentional use of the sinthome allows for the Real to make "little prods" in language, in Lacan's words, the earthquakes in the tectonic plates. By repudiating the language of classical mechanics and slipping underneath through image-pictures, Einstein finds cracks in the concepts of absolute time and absolute space, the inertial frame of reference, and the wave nature of light. His exploration of these silences, via thought experiment, uncovers new meanings. Correspondingly, Stephen, faced with the lack of mother in Catholicism, Irish nationalism and language, opts for "unspeeched" breaths and word play to extend the Symbolic without undertaking the violence of naming. Molly's recourse from "yes" and "he" also comes through similar invention:

> …I was coming for about 5 minutes with my legs round him I had to hug him after O Lord I wanted to shout all sorts of things fuck or shit or anything at all only not to look ugly or those lines from the strain who knows the way hed take it you want to feel your way with a man theyre not all like him thank God some of them want you to be so nice about it I noticed the contrast he does it and doesn't talk I gave my eyes that look with my hair a bit loose from the tumbling and my tongue between my lips up to him the savage brute Thursday Friday one Saturday two Sunday three O Lord I cant wait till Monday
>
> Frseeeeeeeefronnnng train somewhere whistling… (705-706)

With her orgasm, language breaks down, but hearing the musical train whistle aids her formulation of her orgasm in the form of an onomatopoeia. External reality thus takes on new meaning through the way her memories fill words with past, present and future. The whistle gives her the onomatopoeic word that fulfills the lack in "plain English" that could possibly describe her orgasm. In this light, the "yes" in the chapter has little or nothing to do with an affirmation of the Real woman; while the "yes" and "he" are caught up in chains of empty signification, the

onomatopoeic non-sens of the train whistle acts as Stephen's "wayawayawayawayawayaway," transcending the phallic pleasure of "yes" and achieving the jouissance of the Other mentioned at the beginning of this chapter. Lacan's association of this "feminine jouissance" with The Ecstasy of Saint Teresa, the Baroque sculpture by Gian Lorenzo Bernini (Fig. 6), elucidates his ideas on the relationship between the ineffable female orgasm and the experience of enlightenment. This experiential knowledge only comes through volitional inquiry into ex-sistence, the lacks within the phallic order.

The difference between looking inside for knowledge and looking outside is precisely the difference between searching for the jouissance of the Other and the phallic jouissance of endless desires and significations. Einstein's and Joyce's acknowledgement of the "lack" within their systems of knowledge—an androgynous, wave-particle indeterminate, boundary and binary-defying Real—is what carried Joyce and Einstein to their creative apices.

Fig. 6: Saint Teresa in Bernini's sculpture (woman to the right). From Gian Lorenzo Bernini, *The Ecstasy of Saint Teresa*, 1652; Comaro Chapel, Santa Maria della Vittoria, Rome; Photograph taken by Napoleon Vier, *Wikipedia*; Web, 21 Oct. 2011.

When Thought Experiments Fail

While we have scrutinized the mechanics of the "play" involved in Einstein's and Joyce's thought, we have yet to discuss a mental exercise crucial to the volitional use of the sinthome: the thought experiment. Already, we have encountered a number of successful thought experiments so far, from Einstein's trains and lightning to the falling man inside a box. But why were these

successful, and when can thought experiments fail? To answer these questions, we must first look back at what a thought experiment is.

The thought experiment is the volitional abandonment of reality for an experiential knowledge otherwise lacking in our day-to-day entanglement in material and linguistic discourses. Here, I define reality as the embroilment of the "thought world" and "world of concepts" in language and sensory experiences confined to our sole points of view. As Roy Sorenson, a philosophy professor at Washington University in St. Louis, writes, "thought experiments rely crucially on our sense of absurdity" (253). The thought experiments that are most successful come from an inspiration of "wonder" or "drama" that questions a fundamental concept, which the thinker then "tests" in his or her mind. Like Lacan's "Real," both Joyce's and Einstein's "drama" and "wonder" are coeval with our entrance into the world but inaccessible to the discourses and languages of reality because of their ex-sistence in an ineffable realm of experience. The Real struggles against convention, the "ramparts," and breaks through at certain points through the deliberate use of the sinthome to traverse the "lack." A continual mental preoccupation with the lacks in one's discipline seems to bring about the creative inspiration that leads to the thought experiment, the "little prod" of Lacan's Real. Einstein struggled for years with the discrepancies caused by the absolute inertial frame of reference (indeed his first-ever physics paper, written at age 16, was entitled "On the Investigation of the State of the Ether in a Magnetic Field") (Isaacson 24). Likewise, Joyce spent his whole life fighting against patriarchal orders of religion and nationalist sentiment and chose to examine where those are inherently lacking, in the way those orders silence women.

In this way, the thought experiment is the ultimate repudiation of the Symbolic, allowing both the reader and the creator to participate in an experience of the holes in our conceptual schemes to see the familiar in a completely new light. The thought experiment serves the dual function of a Real exploration in the thinker's mind and a creation of public knowledge that readers can continually re-experience and interpret for themselves. In the act of reading Einstein's

special relativity thought experiment, the reader, too, is encouraged to slip through the perspectives of multiple frames of reference at once. As Tamar Szabó Gendler, a philosophy professor at Yale, writes, "the justificatory force of the thought experiment actually comes from the fact that it calls upon the reader to perform an experiment in thought," rather than simply accepting an axiomatic statement or argument as true (75). While the science historian John Norton argues that a thought experiment is simply a different form of an argument, a rhetorical device seeking to prove a preconceived conclusion, I find that the most successful thought experiments begin without a premise, stemming from "play" and the repudiation of telos. Einstein's ideas of a light-beam rider and a falling man did not begin with an end goal in mind; rather, the "wonder" inspired a thought experiment that brought him to a completely unforeseen knowledge of experience that would have eluded him if not for his volitional slipping out of his subject position in the Symbolic order. Gendler, approaching the thought experiment from the discipline of philosophy, comes to the same conclusion, that thought experiments evoke the Real: they help us "reject shaky (and ultimately false) theoretical commitments in light of newly systematized but previously *inarticulable* knowledge about the way the world is" (my italics, 76).

But Einstein, as a scientist, faced an inherent handicap of which he too was aware: the "image-play" of the thought experiment, in the end, needed to "emit" a concept (like the emitted electron by a photon in the photoelectric effect) in order for the newfound experiential knowledge to come into scientific discourse. With the breakdown of the concept of "absolute time" came the new concept of "special relativity," later followed by "general relativity," which were bound to spawn discourses of their own. In contrast, Joyce, as a writer, could engage in word-play and preserve that enigmatic silence of Nora while simultaneously exploring it, leading to the myriad critical interpretations of *Ulysses* and *Finnegans Wake* today that are self-conscious in their ultimate failure to understand Joyce's writings fully. For the rest of this section, we look at the reasons for the failures of Einstein's thought experiments in later life and the success of Joyce's

thought experiment in *Ulysses,* the 'Circe' episode. The play of music does not begin with an end goal in mind; it is the experience that provides the meaning.

We can see the way that thought experiments go awry through Einstein's attempts in his later years to disprove quantum theory. To understand Einstein's problems with quantum mechanics, we must first reiterate the import of Werner Heisenberg's Uncertainty Principle, which Heisenberg stated in his famous 1927 paper entitled "On the perceptual content of quantum theoretical kinematics and mechanics" (Kumar 241). In a thought experiment, Heisenberg asks us to imagine illuminating an electron to observe under a microscope. Since the most accurate measurement of a position is determined by the wavelength of light, he said asks to imagine our measuring instrument is a high-frequency gamma-ray microscope that can carry out the measurement to the greatest degree of accuracy. However, as per the Compton effect discussed earlier, the light shone onto the electron causes a photon to transfer some of its energy to the electron, making it recoil and causing the photon to ricochet off at a weaker energy level. Heisenberg describes the resultant uncertainty of measurement:

> At the instant when position is determined—therefore, at the moment when the photon is scattered by the electron—the electron undergoes a discontinuous change in momentum. This change is greater the smaller the wavelength of the light employed—that is, the more exact the determination of the position. At the instant at which the position of the electron is known, its momentum therefore can be known up to magnitudes which correspond to that discontinuous change. Thus, the more precisely the position is determined, the less precisely the momentum is known, and conversely. (qtd. in Barad, 116)

But as to the epistemological significance of this finding, two disparate lines of thought developed. As Barad explains, Heisenberg's understanding emphasized the uncertainty of our very ability to know—an epistemic uncertainty: she writes, "a determinate value of the electron's momentum is assumed to exist independently of measurement, but we can't know it; we remain uncertain about its value, owing to the unavoidable disturbance caused by the measurement interaction" (116). Heisenberg's understanding of reality here is thus based on a lack of

knowledge inherent in the pursuit of knowledge—much like Einstein's conception of reality and his uneasiness with the fact that quantum theory proposed that the psi function could "completely" describe a state.

However, Niels Bohr, Heisenberg's mentor, disapproved of Heisenberg's interpretation. He felt that emphasizing *uncertainty* put a limit on knowledge, whereas really what was at stake was the *complementarity* of the two properties: one could not be measured at the same time as the other one. But he went even further: he called into question the physical reality of both "momentum" and "position" themselves, arguing that both refer to classical concepts that allow for a causal chain of events to form in classical mechanics. But in quantum mechanics, he wrote that the "interaction between object and apparatus…forms an inseparable part of the phenomenon. Accordingly, the unambiguous account of proper quantum phenomena must, in principle, include a description of all relevant features of the experimental arrangement" (Barad 119)

Bohr thus argues for a reality that itself is created through our performative act of measurement—"momentum" and "position" are conceptualizations we create and impose upon the observed, with the observed, in turn, responding back to us in terms of an answer (this is the basis of Barad's formulation of agential-realism discussed in the prologue). Heisenberg later revised his view to match Bohr's[20], which came to be known as the Copenhagen interpretation. Rather than "uncertainty" of knowledge, showing a lack in what is knowable, this interpretation emphasized that those quantities and even the electron itself do not exist before our act of measuring. "It is wrong to think that the task of physics is to find out how nature is," Bohr wrote. "Physics concerns what we can say about nature." Science was to "extend the range of our experience and to reduce it to order" (Kumar 262).

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[20] Heisenberg added a postscript to his paper in later years acknowledging Bohr's interpretation (which became the "Copenhagen interpretation" accepted by the majority of physicists even today). See Barad 117-118.

While critics like Kumar and Barad have expanded Bohr's Copenhagen interpretation to imply a way science—and thereby other knowledge systems—create and reshape reality based on performative acts, their interpretations leave no room for the "lack" Einstein saw. They reduce Einstein's idea of reality to an entity "independent of our observation," as Kumar puts it, when in fact we have seen that his ideas of the real are far more complex (262). While Barad's extension of Bohr's ideas allows for agents of observation to regain a sense of objectivity, creating reality through performative acts, she does not note that the shifting and constantly reforming nature of how these "apparatuses" create and morph the fabric of reality creates cracks in the tectonic plates, or "cuts," to use her term. Her idea is that those cuts are made at the edge of where reality *is*; Einstein's, Lacan's and Joyce's interpretation was that the cuts represent the lacks in knowledge that must constantly be interrogated and questioned, so that there is never a tendency to view any knowledge system as "whole" and complete within itself. Barad's view—with debt to Bohr—is that there is nothing beyond our comprehension because our act of comprehending morphs matter itself, giving us the "agency" to create our "realism." Bohr and Barad are realists; Lacan, Joyce and Einstein are Realists.

As a result, Einstein was not content with the Copenhagen interpretation for the same reason he felt wary of the psi function. By taking away unknowability, Bohr created a reality that forms through our own performative acts of measuring and does not incorporate what is outside of our barred scope. So Einstein sought to disprove the Copenhagen interpretation—and made the crucial phallus-y of having a goal in mind before creating his thought experiments. Four notable times, he tried to disprove quantum indeterminacy to Bohr: twice at the 1927 Solvay conference, once at the 1930 Solvay conference and a final time in the EPR paper, written in conjunction with Nathan Rosen and Boris Podolsky. The first two times, Einstein sought to prove that momentum and position were measurable at the same instant. He failed because he neglected to consider that even a scale can only be read by our shining light onto it—which imperceptibly changes its original reading. While the full treatment of these different thought experiments goes beyond the

scope of this paper, a description of the 1930 experiment and the EPR paradox will duly reflect on the issues Einstein ran into with the previous two—all of which Bohr deftly parried and served only to establish the Copenhagen interpretation as the basis of quantum mechanics.

A correlating principle to the position-momentum relation in Heisenberg's Uncertainty Principle was the complementarity of energy and time. After his first two failed attempts to disprove the position-momentum relation, Einstein set out to prove that energy and time were both measurable at the same time at the 1930 Solvay conference. Imagine a box full of light. One of the walls of the box has a hole covered by a shutter that is controlled by a mechanism connected to a clock inside the box. That clock should be synchronized to another clock inside the laboratory. We can then weigh the box and note its mass. Then we set the clock to open the shutter at a particular moment, only long enough for a single photon to escape the box. It is possible at that point to know exactly when the photon left the box. Then we weigh the box again. Because mass and energy are related, there is a tiny difference in mass of the box from before the photon escaped. Using $E=mc^2$, we could also calculate the energy of the photon. Bohr was shocked: it seemed as if Einstein had devised a way to measure the complementary properties of the time of the photon's escape and the energy of it simultaneously (Kumar 283).

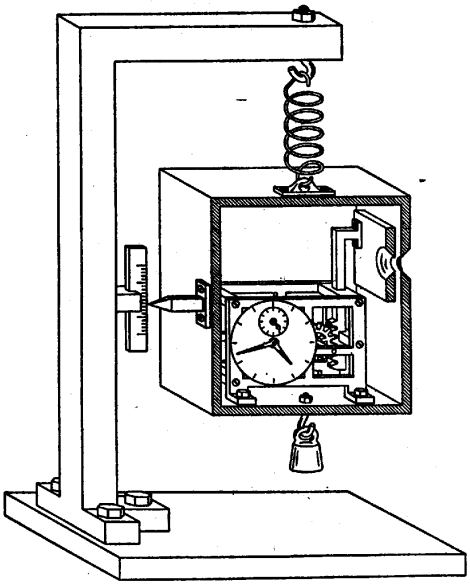

Fig. 7: Bohr's detailed illustration of the light box in an essay he wrote years after the 1930 Solvay conference. From "Discussion with Einstein on Epistemological Problems in Atomic Physics," *Albert Einstein: Philosopher-Scientist*, Ed. Paul A. Schlipp (London: Cambridge UP, 1949) 227. Print.

But Einstein had ignored one important point: his own theory of relativity. After staying up and feverishly working all night, Bohr realized Einstein's mistake. He drew a replica similar to Fig. 7, depicting the box and the weighing device. Because the weight of the box would be slightly

lighter when it releases the photon, it would move upward a little in the gravitational field. The clock measurement in the box would no longer be exactly synchronized to the clock in the laboratory, because of time dilation discussed earlier (Kumar 286-287). Bohr had won this round, as he had won the previous two, because Einstein had forgotten his own theory of relativity.

Einstein's final and most famous attack on quantum theory came through his EPR paradox. Here, he explicitly begins by describing that which he seeks to test: the definition of physical reality. Though the authors say that they will not offer a "comprehensive definition of reality," they essentially do so by establishing a criterion of what is real: "If, without in any way disturbing a system, we can predict with certainty (i.e., with probability equal to unity) the value of a physical quantity, then there exists an element of physical reality corresponding to this physical quantity" (qtd. in Margenau 262). In other words, any physical theory can only be considered complete if it corresponds with every element of reality. If it is possible to measure a physical quantity without disturbing the system, then that quantity is real—and any complete theory must account for it. Already this description of a "real" physical quantity differs from Bohr's view, as he argued that even position and momentum do not exist without our looking for them. Kumar makes the excellent analogy that the EPR paradox sought to show that if a person finds a book in a library that is not in the library catalogue, then the catalogue is incomplete (305). However, from the outset, the authors define knowability by the correlating idea that *it is possible to know whether or not they disturbed the system in the first place*. The thought experiment again becomes limited by an a priori understanding of what the experimenters were looking for and how they would look for it.

In the experiment, the authors ask us to imagine two particles, A and B, which interact briefly and then move in opposite directions to distant parts of the universe. While both the position and momentum of either particle is not possible to ascertain at the same instant, as per the uncertainty principle, the total momentum of both A and B can be measured simultaneously

and exactly, as well as the relative distance between them. The authors leave B undisturbed and decide to focus on measuring A. Quantum mechanics does not allow for a measurement of A that yields exact information about the measurement of B without B being influenced in the process. But the EPR authors posited that if only the momentum of A were measured—and A at this point is light-years from B—then through the law of conservation of momentum, one could ascertain the momentum of B exactly. As per the authors' "criterion of reality" that a physical quantity is real if it can be known to exist without our disturbing it, the momentum of B is a real physical quantity, even without us having directly measured it. In addition, because the relative distance between the particles was already a measurable quantity, by finding the exact position of A, one could deduce the exact position of B without physically disturbing it. Thus both position and momentum were "elements of reality" as per the authors' definition—they were library books that were not in the catalogue of quantum theory. They concluded then that quantum mechanics' description of reality is incomplete. By bypassing the problem of measuring the properties simultaneously, they just proposed that it is possible to know that those properties do have an exact description without measuring them. They answered the counterargument that "two or more physical quantities can be regarded as simultaneous elements of reality *only when they can be simultaneously measured or predicted*" by arguing that the reality of B's position and momentum cannot possibly be based on those of A, which is light-years away from B. "No reasonable definition of reality could be expected to permit this," they write (qtd. in Kumar 307).

In a remarkably Einsteinian way, Bohr's counter-argument rested not on the truth of the EPR authors' conclusion but in their very definition of physical reality. For Bohr, simply knowing that an actual momentum for B exists does not mean anything; only when the measurement is carried out does it possess momentum. One could only talk about the momentum of B in terms of the measuring apparatus and A's measurement. But Bohr also went further to say that since A and B *had* interacted at one point, they would always be part of a single system: between the two particles, there would always be "*an influence on the very conditions which*

define the possible types of predictions regarding the future behaviour of the system." To Einstein, this "influence" seemed akin to Newton's "action at a distance," working instantaneously with no account of the forces in between (Kumar 312). Later, Schrödinger would term this state "entanglement"—and later experiments in quantum physics would prove this ghostly interaction.

Einstein's folly was to predefine "physical reality," disallowing him from the freedom of "wondering" that took him through his earlier thought experiments on special and general relativity. By having an end goal in mind—the establishment of his ideal of reality—he abandoned the "playful" aspect of the thought experiment; instead, it became a polemical argument. His mistake directly correlates to that of the narrator of 'Ithaca,' the episode of *Ulysses* that Joyce wrote in the "mode" of "Science" and the "technic" of "(impersonal) Catechism," according to the Gilbert schema (735). Like the Catholic catechism, a question and answer-based "authoritative exposition" of Christian principles for the instruction of young Catholics like the teenage Joyce, the entire episode consists of an unnamed questioner interrogating an unknown answerer on the actions of Bloom and Stephen as they walk toward Bloom's house (*OED)*. Like Einstein, the questioner seems to be in the pursuit of establishing simplicity, causality and reducibility of ideas so that the sudden entanglement of "Stephen Blephen" and "Bloom Stoom" during the course of the day reveals causal and relational ideas: "How many previous encounters proved their preexisting acquaintance?" "Did their conversation on the subject of these reminiscences reveal a third connecting link between them" "What relation existed between their ages?" (633).

Joyce's questioner, who is representative of both religious and scientific authority, thus determines the "measuring apparatus" by which we can look at reality. His questions at the outset delineate what we can know and direct our inquiry toward establishing patterns and relations—as science is taught to do. We are thus bound by a reductionist Bohrian and Baradian reality, one that can only exist in relation to the measuring apparatus, the narrator's question (though in

between each question lies a giant space on the physical page, a lack). Joyce's use of this mode is wholly ironic: as mentioned before, the novel does not end with any grand telos as Homer's epic ends with Ulysses' and Penelope's happy reunion (971). Rather, Bloom and Molly still have a strained sexual relationship, and Stephen goes home instead of staying the night in their house and fulfilling their desire for a son. The 'Ithaca' narrator is limited by his need for connectivity and telos, which Joyce purposely refuses to provide. Einstein faced the same limits in his quantum mechanics thought experiments, limited by his own Symbolic definition of "physical reality" and his predetermined goal.

In contrast, Joyce's use of the 'Circe' episode as a thought experiment is based on a complete destruction of any definition of reality. Surrendering to "play," Joyce wrote 'Circe' in the form of a drama, related both to Joyce's Real and the "play" of music. As a result, while other events happen at some point before they are "thought" into words or narrated by the characters or the seeing "I," the entire action of Circe happens in real time. The present-tense play format implies an observer behind the "fourth wall" of the theater and thus incorporates the reader into the action more fully than any other episode. Whatever semblance of conventional realism that Joyce creates through his sprinkling of Dublin "facts" and living people throughout the novel fades as Bloom and Stephen enter the hallucinatory "Nighttown," the area of Dublin known for brothels. Critics often call 'Circe' the "subconscious" of the novel because of the way reality seems to be suspended: characters repeat phrases they would not have heard before, genders change without warning, and ghosts of the characters' presents, pasts, and futures arise from the dead and participate in dialogue as if real. There is no warning to the reader before this plunge. Following the way Joyce perceives the Real as "drama," perhaps there is no need of warning: drama is far more Real than reality anyway.

'Circe' succeeds where Einstein stumbled because it does not propose a definition of reality or define its goals at its outset. Indeed, critics are often torn about how to use its absurdity and undeniable presence as the longest episode of the novel in their arguments, often resorting to

discussing its occult elements or its use for bringing Stephen and Bloom together. John Gordon, who argues for Joyce's strict empirical realism, explains every hallucination in 'Circe' as a result of alcohol or epilepsy (156-196). But why does Joyce need to use the medium of a completely absurd, causality-less, boundary-blurring "drama" to illustrate any of those points also present in other episodes? If we instead view 'Circe' as a thought experiment, we can see why it would be necessary for Joyce to call upon absurdity. As a thought experiment provides the ground for testing fundamental concepts that seem to "lack," Joyce's ultimate thought experiment of 'Circe' tests whether the patriarchal bloodline, the letter, and male nationalism can exist if given as much importance as prescribed by societal discourse.

From the outset of 'Circe,' Bloom realizes that his "wildgoose chase" for Stephen is also a pursuit for his bloodline. He deeply feels that his paternity was taken away from him with the death of his son Rudy as an infant, as his only remaining child is his daughter, Milly, who will not carry on his name. Accordingly, when Stephen informs Bloom in the previous episode that he is going to Nighttown, Bloom feels fatherly concern for Stephen's safety and follows him (408). Even as Bloom searches for Stephen, however, he is confronted with his own lack. When he sees a "phallic design" scrawled on the wall of a house, (429) rather than associating the image with himself, he says "Odd ! Molly drawing on the frosted carriagepane at Kingstown" (429). Like Nora, Bloom's wife is more sexually aggressive than Bloom, and the drawing only reminds him "my spine's a bit limp" (429). As we shall see, throughout 'Circe,' his ability to save Stephen and "adopt" him constantly becomes questioned because of what he and the townspeople perceive as his feminine qualities.

The concept of the letter comes into question when two watchmen suddenly materialize and take Bloom into custody after Martha Clifford, Bloom's pen-pal and mistress, appears and accuses him of being a "heartless flirt" (433). Bloom's confession that he follows a "literary occupation" as an "author-journalist" arouses the suspicion of the townspeople who crowd onto the scene. One of them accuses him of being a "plagiarist" (435), of writing unoriginal content

that does not show his true barred self. In the mock trial that ensues, "several highly respectable Dublin ladies" ascend to the witness stand to accuse him of sending them "improper letters" (442) Mrs Yelverton Barry says he wrote her "an anonymous letter in prentice backhand" and "made improper overtures to me to misconduct myself at half past four p.m. on the following Thursday" (441). Mrs Bellingham testifies that "he addressed me in several handwritings with fulsome compliments" and 'lauded extravagantly my nether extremities" (442). In opposition to the original sin, these women testify that Bloom, the man, urged them to "misbehave, to sin" in an "unspeakable manner," as The Honourable Mrs Mervyn Talboys puts it (442). Written into being purely by his lewdness and attempt to assert his phallus, the women turn on him and call for the law to "geld him," "vivisect him," and "thrash the mongrel within an inch of his life" (443). Bloom is forced to confront the lack of the phallic jouissance he seeks to provide.

Joyce later tests male nationalistic ideals when Bloom starts to make a political stump speech and townspeople call for his election as "Lord Mayor of Dublin" (452) because he is a "man like Ireland wants" (457). The women who previously accosted him appear at the "windows…thronged with sightseers, chiefly ladies" (453) and throw "rosepetals" down onto the streets (455). The townspeople call for Bloom to become "Leopold the First," the "emperor president and king chairman" of Ireland, capable of starting a royal bloodline (455). The women proclaim him "little father" and hold up their "babes and sucklings" to him in the midst of a general rush of approval by the entire of Ireland, including John Howard Parnell, the Irish national hero Charles Stuart Parnell's brother (459, 454).

But the city begins to turn against him when, after having ascended to the "stone of destiny," he begins touting his own values: "union of all, jew, moslem and gentile," and the "Esperanto" of "universal brotherhood" (462). Advocating for love and linguistic coagulation, "Esperanto," Bloom also calls for "mixed races and mixed marriage" and "no more patriotism of barspongers and dropsical imposters" (462). But Bloom's well-intentioned attempt to abolish patriarchal law by becoming another law that advocates wholes of "brotherhood" (excluding

women) and one universal language makes him hypocritical. The townspeople criticize him as an "an anythingarian" and start clamoring for a revolt. The "fellowchristians and antiBloomites" find him a "disgrace to christian men" because he is a "worshipper of the Scarlet Woman" rather than a Father God (464). A trial ensues in which Buck Mulligan reappears as a doctor and examines Bloom, only to conclude after a "pervaginal exam" that he is "bisexually abnormal," androgynous (465). His political career, too, ends in a confrontation of his phallic lack.

Any hope for a patriarchal, kingly or lawful bloodline devolves and Dr Dixon calls Bloom the "new womanly man" (465)—an idea Joyce found in Otto Weininger's 1903 book *Sex and Character*, which describes Jews in a racist and sexist way as feminine, according to Ellmann (463). The same idea, also put forward by Lorentz and Sommerfeld about Einstein, as we saw before, finds a bit of redemption in 'Circe' because Bloom, as a womanly man, is able to feel compassion for both sexes. After admitting that "o, I so want to be a mother," Bloom proceeds to give birth to his own progeny of "eight male yellow and white children…all handsome, with valuable metallic faces, wellmade, respectably dressed and wellconducted, speaking five modern languages fluently and interested in various arts and sciences" (Joyce, *Ulysses* 467). Birthed by a man, they become clones of the Symbolic Order. Bloom cannot reproduce his own androgyny, as it ex-sists outside of the discourses of reality (466).

As his ideas of the bloodline and universal brotherhood collapse because of his tendency, like Molly, to refuse boundaries, he sees the lacking phallic signifier that keeps it all in place: "Man and woman, love, what is it? A cork and bottle," the cork being filled with holes and the bottle already empty (471). The letter too, rather than carrying phallic potential to achieve a sexual jouissance, becomes "the unposted letter bearing the extra regulation fee before the too late box of the general post office of human life" (496). Bloom, in this Reality, is able to acknowledge his own lack as well as the influence of the Symbolic order as the "extra regulation fee" barring his ability to ex-sist, like Molly, outside the order.

In his Realization, he becomes a woman, a "charming soubrette with dauby cheeks, mustard hair and large male hands and nose" lorded over by Bello, the androgynous pimp who previously appears in the episode as Bella (502). Bloom's change into a woman signifies his full inscription into a new womanly order. Here, "science" of absolute time does not explain the "various joys," but rather apparitions of past and future intertwine to tell Bloom's story. The "Sins of his Past" emerge and discuss his worst actions (503) and Bello foretells the future, that Molly's other men will "violate the secrets of your bottom drawer" and "pages will be torn from your handbook on astronomy" (508). As "drama" and the Real are necessarily personal and experiential, so the woman's order does not bother itself with cosmic, astronomical secrets but with the "personal woe" that Joyce says the purest drama evokes (508). For this reason, Stephen's cry to Mr. Deasy's masculine history fails to undo his guilt when he finds himself face-to-face with a ghastly apparition of his dead mother. "Cancer did it, not I. Destiny," he says, and a scene of apocalypse ensues until the masculine, Symbolic Order of the novel's reality reenters in the form of a police officer (540).

In the end, the fundamental concepts Joyce tests through 'Circe'—the line, the letter and male nationalism—break down. Stephen's and Bloom's hopes of impressing their masculinity upon society keep getting upturned, questioned: Bloom's bloodline becomes literally his babies that he births who immediately enter into the Symbolic order; Bloom's stump speech toward kingship and proposal of grandiose concepts like universal brotherhood becomes a way for the crowd to reveal him as a "womanly man," a Jew; Bloom's assertion of his phallus via letters to numerous Dublin women results in his prostitution—as a female—at a brothel; and Stephen's plea to "destiny" results in apocalypse. The lack in the patriarchal concepts that troubled Joyce and his male characters finds clarity in a moment when Bloom acknowledges man's perpetuation of phallic illusion: "in my eyes read that slumber which women love" (495). The quantized particle or concept emitted from the thought experiment as Joyce's flirtation with the Real beyond

reality is the "slumber" of men and women—illusion, our immersion in the Symbolic Order that closes our eyes to Reality.

Circe is the sorceress whose illusory magic turns Ulysses' men into swine, as the "slumber" of men does in the episode—and in reality. But Joyce's primary interest in the Homeric parallels was that Ulysses was only able to save his men through the help of Hermes, who Joyce describes as the "god of public ways," the "god of signposts," and the "point at which roads parallel merge and roads contrary also" in an "accident of providence" (*Selected Letters* 272). As a thought experiment, the episode exhibits public, experiential knowledge by providing a glimpse of the Real underneath binaries "parallel" and "contrary"—just as Hermes provided Ulysses with Moly, the herb that would resist Circe's magical illusions.

In contrast to Einstein's thought experiments on quantum mechanics, which were limited in reach from the start by their pursuit of an end goal, we can see Joyce's allowing for the free play of "drama" through the enormous difficulty he faced in putting the episode into words. In a letter to Frank Budgen, he writes that his work so far on 'Circe' was "a dreadful performance," as the episode "gets wilder and worse and more involved." He finishes, "but I suppose it will all work out" (271), implying a sense of surrender to the episode's "whirligig movement." He thus echoes Einstein's "sinthomatic" use of "wonder" in his earliest thought experiments on relativity. As a thought experiment must be experienced to provide Real knowledge, Joyce had to write and rewrite 'Circe' "some six times" in order to understand it for himself. But after he finished, he believed it was "the strongest thing I have written" (270). By far, it was his most clear evocation of the Real yet.

But how does 'Circe' distinguish itself from any other novel? Isn't every novel a thought experiment, a suspension of reality as we know it? Joyce, in addition to suspending the novel's reality of time and place in 'Circe,' foregrounds the "measuring apparatus" of myth, language, and patriarchal ideals in the creation of society. It is this ability to see symbolism in the very implements through which we construct that also brought Einstein to thinking about clocks and

rods, the measuring apparatuses that give the semblance of absolute time and space. Both saw and used these symbols, and it was only through their use of them that they could find the lacks within them.

As Einstein elsewhere writes, there are two kinds of thought: "constructive" and "speculative" ("Autobiographical Notes" 21). While the speculative corresponds to "wonder" and "drama," the constructive is also a necessary tool in both literary and scientific invention. Joyce was able to use the myth to structure the narrative of his novel, but he also used that very symbolic invention to turn upon itself. Thus it is clear that neither Einstein nor Joyce completely renounce structure. As Einstein wrote in "Autobiographical Notes," "A system has truth-content according to the certainty and completeness of its co-ordination-possibility to the totality of experience. A correct proposition borrows its "truth" from the truth-content of the system to which it belongs" (13). Einstein's ability to slip through image pictures while imagining riding a light beam would not have been possible if not for the understanding he gained from studying Maxwell's mathematical equations. Likewise, Joyce would not have been able to engage in his play of language without his study not only of Greek myth but also of the classics of Western philosophy, from Aristotle to Kant. There is indeed some amount of organization and "construction" in thought and knowledge; however, only with such inquiry and accumulation of knowledge as Einstein and Joyce engaged in can one also understand the lacks within knowledge through which Reality is accessible.

Coda

Reality vs. reality:

BIG TRUTH OR LITTLE TRUTHS?

ॐ असतो मा सद्गमय ।
तमसो मा ज्योतिर्गमय ।।
मृत्योर्मामृतं गमय ।
ॐ शान्ति शान्ति शान्ति ।। –
बृहदारण्यक उपनिषद् 1.3.28.

Om asato mā satgamaya
Tamaso mā jyotir gamaya
Mṛtyor mā amṛtaṁ gamaya

Om Shāntih Shāntih Shāntih

Lead me from the Unreal to the Real.
Lead me from darkness to light.
Lead me from death to immortality.

Om Peace Peace Peace

(Bṛhadāraṇyaka Upanishad— I.iii.28. c. first millennium, B.C.E.)

What is the difference between the Real and Truth with a capital T? I begin this coda with a standard Sanskrit prayer from the Brhadaranyaka Upanishad that I have been reciting aloud every day since before I can remember. The last word of the first line ends in *sat*, loosely translated to me by my mom as the "Real" when I bothered to ask her many years ago. But as I grew up, I saw it appear in prayer books with a number of different translations: "Truth,"

"existence," "being," and "self-existent," to name a few. But if words are always lacking in their ability to represent, what am I praying for?

Many a Lacanian scholar has asked a similar question, and I believe the answer lies in the difference between the phallic jouissance, which aims to fulfill fantasies of the One, and the jouissance of the Other, which is the ineffable pleasure located in that which is inaccessible to the Symbolic Order of linguistic and material discourses.

Most academicians in the humanities would carefully downplay the idea that their field functions for the purpose of finding or accumulating all of Truth one day—a goal the theoretical physicist Stephen Hawking called the "ultimate triumph of human reason—for then we would know the mind of God" (185). Perhaps some physicists have tempered their view from Stephen Hawking's over the past few decades; certainly Karen Barad merely attempts to paint the picture of reality as we know it, rather than attempt to "know the mind of God." But what about Truth is so scary to academics? Truth purports wholeness, an endpoint of knowledge somewhere on the frontier. If one day, we were to write the last word of the last book and know the secrets of the universe, there would be no more need for further learning, universities or teachers. But who would write the history of this last writer, and who would write the history of the person who wrote that history, and so on? Secretly, each separate tectonic plate-dweller knows that his or her discipline does not have a route to all the knowledge needed to reach a Truth beyond.

But academics are not nearly as shy to propose grand theories of reality, from economic theories of human behavior to Lacanian psychoanalysis. A theory of reality (like Barad's) bases itself on findings and texts within a particular discipline (hers was theoretical physics and feminist science) and ostensibly forwards the notion that generalizations of that theory to other fields could bring us to a greater understanding of reality. But aren't we using "Truth" and "reality" interchangeably? We fool ourselves that the outward expanse of reality in our disciplines—such as critical theory in literature and grand unified theories in physics—do not

yearn to become a Truth. Hiding under the signifier of "reality" seems to be the pursuit of Truth, wholes.

But while discourse of reality is still alive and thriving, we seldom discuss the Real, the lacks in the conventions of our disciplines. The Real in the sense of Lacan, Einstein and Joyce does not come from reality, which is entangled in linguistic and material discourses; rather it erupts into their thought from a tendency to view their own disciplines critically. Einstein looked into the ponderous concept of ether and found tenuous assumptions based on an absolute frame of reference, which led him to abandon the absolute; Joyce examined the hegemony of words that represents masculine orders and found that what underlies these ideas is the "slumber" of men; and Lacan found in clinical practice that language forever fails to signify the Real referent, like the inverted vase or bouquet.

But a large part of these thinkers' success in encountering the Real is their scholarly pursuit without presupposed notions of what they might find. Unknowingly led by wonder, the 16-year-old Einstein imagined himself riding a lightbeam and gazing over at a parallel light beam to see what it might look like. The older Einstein would imagine what it would feel like to be in free fall in a closed box. Letting these thought experiments play out brought him to the first inklings of special relativity and general relativity, respectively. Similarly, Joyce constructed *Ulysses* carefully but without rigidity in "play." The last word of *Ulysses*—"yes"—was in fact not Joyce's creation: a 20-year-old Frenchman named Jacques Benoist-Mechin who was helping Joyce translate passages from English to French before the 1921 public reading by Larbaud decided to add a final "oui" at the end of 'Penelope,' even though Joyce had left it with "yes I will" (Ellmann 535). When Joyce saw it, he initially objected to it. "But this is a big question," he told the young Frenchman, "the last word of a book is very important" (536). But after talking for several hours with Benoist-Mechin, the Frenchman convinced Joyce that the book must end with yes, "the most positive word in the human language" (536). Both Einstein's and Joyce's willingness in these instances to go along with chance brought them to the highpoints of their

creative careers. Such is the nature of the sinthome: by observing their symptoms (that the language of their disciplines failed to fully describe reality), they became both observers and agents in their own existence. They allowed "wonder" and "drama" to take them to places even if they did not know where they were going. That is the volitional use of le sinthome.

But toward the end, Einstein began to fall into the mistakes of authority and forgot how to "play"; he began to see himself as "having" the phallus in Lacan's terms, being the "father" of the new physical reality defined the generalizable laws of his special and general theories of relativity among all inertial and non-inertial frames of reference. His thought experiments on quantum mechanics were doomed from the start because he had an end goal in mind—the establishment of his idea of reality—before embarking on the journey. The phallus-y of proposing a criterion for physical reality before "suspending" reality resulted in thought experiments that did not give play to "wonder"; Bohr was easily able to see their inherent inhibitions. But as we can see from Joyce's 'Ithaca' episode, named for Ulysses' home, any semblance of telos merely amounts to a father figure and son figure sharing a cup of Epps' cocoa and then parting ways, perhaps never to meet again. End goals are only in Mr. Deasy's history, not in the differential view Stephen holds of the "quanta" of history.

To explain Einstein's mistaken pursuit of the whole later in life, we can find clues in his personal relationships. As he became older, though he continued to live in Berlin with Elsa, he retreated into science, turning a deaf ear to Mileva's worries in Zurich, which revolved around their son Eduard's increasingly manic behavior. In 1929, Eduard slashed all the books and furniture in Mileva's apartment with a knife, threatened to commit suicide and, when Mileva held him back from the window, turned on her and attempted to strangle her (51). But Einstein's troubles with the Nazis, his flight to America in the early 1930s, and the drying up of his trust fund for Mileva as a result of the depression meant that soon Mileva found herself on her own for financial and familial support. One cold day in 1946, as she was walking to visit Eduard, she slipped on ice and fell unconscious until strangers rescued her. In poor health, she suffered a

stroke a few months later and fell into a subsequent coma for three months, during which all she would say is the word "no" (qtd. in Isaacson 516). She died soon after and was buried in an unmarked grave (Chiu 51).

Though Einstein would continue to send money to take care of Eduard's institutional expenses, he would never again make contact with him: "There is something blocking me that I am unable to analyze fully," he wrote to his friend Carl Seelig in 1948 (qtd. in Isaacson 516). As for Eduard, he lapsed into a daze after Mileva's death and never mentioned his mother again. During these later years, after abandoning Mileva, Einstein remained lost in his old ways and found himself unable to "play" with the Real in his quantum thought experiments as he had while exploring relativity with Mileva.

While Einstein barely paid attention to the absence of Mileva in his life after he came to the U.S., Joyce continued wrestling with the silences of women throughout his life. His anguish largely centered around his daughter Lucia, whose personality reflected the erratic environment in which she grew up, with the Joyces constantly moving throughout Europe and scrambling for money. As her mental state deteriorated in her late twenties, Joyce continued examining her words, noting to his publisher Harriet Shaw Weaver that Lucia's letters lack "even casual connections" (*Selected Letters* 81). After years of causing Nora "deep maternal distress" according to Joyce, Lucia had to be carried out of the house in a straightjacket in March 1936. She was sent to a sanatorium in Ivry and would remain the rest of her days in an institution. But Joyce continued to visit her and puzzle over her, publishing a book she wrote with his own money so she would not feel like "her whole past has…been a failure" (Ellmann 703). The second time he ever cried while writing a letter was while discussing Lucia's condition with a poignancy and passion equivalent to that of his letters to Nora in 1909. He wrote, "I am again in a minority of one in my opinion as everybody else apparently thinks she is crazy. She behaves like a fool very often but her mind is as clear and as unsparing as the lightning. She is a fantastic being speaking a

curious abbreviated language of her own. I understand most of it" (*Selected Letters* 376). But not all—and in his acceptance of the lack came his deepest insights into reality and Reality.

Einstein's and Joyce's greatest creativity, I have argued, came from their examination of that silence of woman. Where they leave the symbolic order and language of their discipline to examine the lack underlying knowledge, they find Real knowledge. In his earlier years, Einstein seemed exclusively concerned with examining the lack in the already-existing monolith of classical mechanics—which led him to his revolutionary breakthroughs on light and relative motion. Joyce found a way to create new wor(l)ds and engage in onomatopoeic word play, which would later lead him to write his most creative book in Nora's eyes—*Finnegans Wake*, a novel consisting almost entirely of made-up words, a complete repudiation of the Symbolic Order. "What's all this talk about *Ulysses*?" she asked a friend late in life. "*Finnegans Wake* is the important book" (Ellmann 755).

But if Real knowledge lies where women are silent—outside the symbolic order—what does that mean for the ability of women to express through language? Lacan theorized that women have access to the jouissance of the Other, that which is experiential and ineffable, related to experiences of spiritual enlightenment. But the tradeoff to having this ease of access to the knowledge of silence is that women face the threat of being obscured by the symbolic order, as Judith Butler showed through her important work in gender theory. Indeed, as many feminist critics have shown, inherent in Joyce's writing of 'Penelope' and bringing Molly's body and mind into being is that she becomes inscribed in words. But I see her way out through the onomatopoeias of the train whistle, through the slipping underneath signifiers that Joyce does in describing her thought process. The way for women to express themselves fully—and indeed for men too—is to resort to play, combining language with experience. But this calls for a radical change to our theories of knowledge.

A Philosophy of Indeterminacy

The nature of light is indeterminate. We cannot say with authority if it is a wave or particle without also including a description of our measuring apparatus. And certainly we cannot say it is both, implying a melded whole. It is neither, yet it is.

Like light, the play of thought experiments thrives on rejecting boundaries of symbolic thought. However, a successful thought experiment does not call for an absurdist dream to replace reality; it simply gives space for the universe's forces that aim toward complexity to "play." Through the play in the differential space of Stephen's *Nacheinander*, new experiences arise, like special relativity and the space-time continuum, like "wayawayawayawayawayaway." But eventually these experiences must and did materialize in scientific discourse as concepts and in literary history as a solid, many-paged novel. Thus there is also a downward force, that which brings about the structures of myth to experience; the orchestrated collapse of Schrödinger's wave function that reveals the position of the electron; the specific experimental arrangement that identifies light as either particle or wave. Whatever possibilities are engendered in Schrödinger's "matter wave" are reduced to a point when we attempt to bring the concept of "one solution" back into discourse (Einstein, Przibram, Schrödinger, Planck and Lorentz 33).

The supposed inevitability of this downward symbolization or materialization—the idea that there is no way to express creativity to society without being imprisoned in linguistic and material discourses—is the foundation of Lacan's symbolic order. For example, in Christian philosophy, knowledge is symbolized as the apple of original sin from which Eve took a bite. The bite gives birth to the infinite possibilities of what civilization could become, which then leads to the downward signification of names, kings, kingdoms, tribes and scriptures that find their way into history textbooks. Despite the availability of upward complexity, the materialized concept of original sin still marks much of Western philosophy and theory, just as it marked Joyce. Christianity-steeped Western philosophy preaches in terms of emitted concepts in order for us to

understand the knowledge of reality, just as Adam had to name every creature and plant to pursue an existence. Indeterminacy is not an option for the creation of knowledge in Western thought.

Emitted Christian concepts, the discrete quanta of Western philosophy that describe only one dimension of light, find an alarming amount of hegemony among theorists, from Lacan to feminist thinkers reacting to Lacan. God's "Let there be light!" appears in Judith Butler's book as an example of a performative statement that *adds authority to her theory of reality*, even though it is a Christian, mythical and mystical scriptural denotation. Lacan's "Name of the Father" concept, when traced to a root of patriarchy, appears to come from the idea of Father God creating Adam in his image and giving him his name. Jacques-Alain Miller, the translator of many of Lacan's seminars and a noted Lacanian theorist, refers to women's circumscription in the symbolic order through the story of Adam and Eve: "Everyone knows the story of the rib from which God made a woman," he writes ("You Are the Woman of the Other and I Desire You").

Luce Irigaray, a noted feminist psychoanalytic theorist, attempted to follow Lacan's perceived phallagocentricism with theories of feminine divinity, but found that Western civilization is "without any female philosophy or linguistics, any female religion or politics" (qtd. in Oh). Even Gayatri Chakravorty Spivak, one of the first Indian literary theorists, self-consciously admits in her famous essay "Can the subaltern speak?" that she must call upon Western theorists—Karl Marx, Michel Foucault, and Gilles Deleuze—to discuss the meaning of *sati*, the Indian tradition of widows committing suicide on the funeral pyres of their husbands. In the 1988 essay, she wrote that Western theory does not "entertain the thought of constitutive contradiction" and creates an "effectively heliocentric discourse" which places the "Subject of Europe" as the "historical sun of theory" (69). In 2011, I think the same hegemony still exists.

But even as she realizes this, she fails to bring core Hindu philosophy into the conversation, instead focusing on Hindu mythology to create her argument. Yet what is mythology but the emitted, societally-sanctioned story of an underlying philosophy, perhaps far more complex? We see Spivak's moment of ignoring underlying indeterminacy as she discusses

sat, the Sanskrit word that "transcends any gender-specific notion of masculinity and moves up not only into human but spiritual universality" (100). Rather than mulling on how to enable that original meaning, often translated as the "Real" (as in the monograph at the beginning of this section), Spivak focuses on the word's slippage into its feminine form as *sati*, which she defines as "good wife" (100-101). She goes on to discuss the symbolism of the myth of the god Shiva and his wife Sati, who immolates herself to protect Shiva's name and reputation—and we lose the moment of understanding what *sat* might mean, how we might experience *sat* instead of finding ourselves mute and labeled as "satis." Because unfair constructions of power form the focus of her argument, she is concerned with representing reality "as it is" (that the brown woman cannot speak through the white theorist theorizing about oppression). But like Joyce, Einstein and Lacan, I am concerned with understanding that which is underneath the systems of reality, the mythology, and the signifying practices. How can we experience that indeterminacy without becoming lost in the myths of theory?

As opposed to Western philosophy, where Biblical stories contain "fact" enough to warrant citation in theories of reality, Eastern philosophy, like the quantum, foregrounds its symbolism and fictionality. Anyone with basic knowledge of Hinduism immediately pictures the thousands of gods and goddesses, each with numerous heads, arms, and weapons, each ranging in visage from gruesome and grotesque Mother Kali to pure and beautiful Goddess Saraswati. As aspects of the underlying divine indeterminacy called Brahman, these deities are understood to be mere evocations, the "quanta" of Hinduism. All of these gods are inherently lacking; indeed, deity-worship is considered to be the lowest form of Hinduism, and formless identification with Brahman through the experience of silent, thought-free meditation is the highest. In one of the oldest Hindu scriptures, the Brhadaranyaka Upanishad, the unnamed author(s) write(s) that the only way to describe Brahman is to say "Neti, neti": "It is not this, it is not that". Brahman is "incomprehensible, for it cannot be comprehended; undecaying, for it never decays; unattached, for it never attaches itself; unfettered, for it is never bound" (Prabhavananda and Manchester

111). Metaphor and metonymy alike are cast aside, leaving merely negations, lack. We could just as easily attach this millennia-old definition to a modern-day description of light's physical properties. The unspeakability of Brahman foregrounds the holes in the scripture: the text can describe all the many forms in which we might conceptualize Brahman but cannot provide the experience of this indeterminacy.

And yet, as we can see through the formation of the universe and society, there is also downward causation into entities. In Hindu philosophy, sexual difference arises through the ignorance of the thinking mind, which we might correlate to the Imaginary or Symbolic orders dividing the subject from the Real. The need to see God in an anthropomorphic way creates an urge to understand creation in the way we experience it in our biological existence: through the copulation of the male and the female. Aurabindo Ghose, an early-twentieth century, renowned Indian spiritual guru and scholar in Eastern and Western philosophy, wrote that our need to look for a "sole-existent Person and Ruler" obscures from us the "power or Shakti by which he does all things," which then "becomes an attribute of His cosmic personality; the absolute monarchy of the one Being becomes our perception of the universe" (321). So duality comes into being: Purusha, a male entity that refers to the will or cause who acts through the creative force of Prakriti, defined as Nature and the Divine Mother, and "it is through her that [Purusha]…acts and he does nothing except by her" (322). Prakriti, the self-acting creative power of the universe, becomes the world of forms and non-forms (*murta* and *amurta* in Sanskrit), creating and dissoluting continuously. But even as Ghose discusses these gendered entities (also described in the Upanishads), he remains conscious of their insignificance:

> Our abstractions get fixed into differentiating concepts with sharp lines between them: but the Reality is not of that nature; its aspects are many but shade off into each other…The mystery of things is the true truth of things; the intellectual presentation is only truth in representation, in abstract symbols, as if in a cubist art of thought-speech, in geometric figure. It is necessary in a philosophic inquiry to confine oneself mostly to this intellectual presentation, but it is as well to remember that this is only the abstraction of the Truth and to seize it completely or express it completely there is needed a concrete experience and a more living and full-bodied language." (Ghose 323)

Here, we see the use of both "truth" and "Truth" to describe Reality. Successive approximations of "truth in representation" approach an asymptotic truth, but this truth is only in "intellectual presentation," or the material and linguistic discourses that shape our ability to express in reality. Truth with a capital T, in Ghose's language, corresponds roughly to the Real of Lacan: that which can only be understood or reached through experience.

What if the indeterminate probability wave of Schrödinger's wave function were more Real to us, according to our philosophical background, than its subsequent determination as a material point? What if quantum indeterminacy were the very basis of our religion? What if the stories of Adam and Eve and original sin and God as Father were simply results of our own ignorance, and ignorance itself were more important to understand than the emitted mythology? Lacan, confined to interpretation from Christian mythology, could only do his best to convince the world that the phallus was a symbol of lack. Feminists refused to buy it because of the blatant patriarchal history of the phallus. But what if the universe of forms and not-forms were instead gendered feminine, as Prakriti? What if our inquiry into indeterminacy were to traverse this feminine in order to see Real?

The absence of women in the Symbolic order of reality, as Lacan and Spivak and others variously have shown, does not mean there is no other recourse. It simply calls for new modes of conveying that ab-sens by volitionally slipping underneath the established linguistic discourses of disciplines and engaging different parts of our understanding all at once. A belief in emptiness is the potential to live fully, in infinite modes without needing to form a whole. Infinity is not One, as any mathematician could tell us, no matter how much scripture attempts to coalesce the concepts under the idea of an omnipotence. A philosophy of indeterminacy in the religion of academia could lead scholars to embrace technology's infinite modes of signification and allow for experiment that can lead to the "more living and full-bodied language" that Ghose calls for. If there is a crisis in the humanities today, it is our lagging adaptation to these new modes available.

New styles of academic writing, alternate juxtapositions of visual and linguistic information, interactive displays, music, multimedia—all of these can make scholarly work far richer, allowing for the joint reader-creator experience enabled by Joyce's and Einstein's most effective thought experiments.

My goal in this brief philosophical musing is not to propose that Hindu philosophy is superior to other systems of belief; rather, lack is inherent in every scripture, but Hinduism just happens to foreground it and make it essential to understanding the path to enlightenment.[21] As long as critical theory continues to ground itself *solely* in footnotes to Kant, Aristotle, Descartes and the Bible, it precludes itself from allowing for alternative realities, like Eastern philosophy, like the experiential knowledge we obtain from Joyce's and Einstein's thought experiments that invite the reader (and thereby the public) into the process of creativity (and do not hide behind dense prose only accessible to the Ivory Tower, as characteristic of Lacan, Spivak and Butler's writings). The process of making scholarly knowledge accessible to the public forces us as academics to think about knowledge in new ways and media, deepening our own understanding of our subjects and disassociating knowledge from nodes of power like a government or university. If there is a moral to this lesson in scripture, it is that Joyce, Einstein and Lacan understood the lacks in the Symbolic Order and the power of experiential knowledge to traverse this silence. That is creativity.

Though I had memorized the English meaning of the Sanskrit prayer when I was a child, the words and musical intonations of Sanskrit have an indescribable richness that I could never quite understand with my American-accented tongue as I chanted. And yet, strangely enough, the experience of writing this thesis, attempting to put Real and Unreal into English words, has given me new understanding of an ancient Sanskrit scripture. Intellectual enjambment and unexpected scholarly play in a completely different medium has given me a glimpse at the meaning of Real.

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[21] (and to be clear, I understand enlightenment not to be an end goal, but a state of being)

Works Cited

Ansari, Anjum. "Introduction to Statistical Mechanics." *Department of Physics*. University of Illinois at Chicago. Web. 4 Nov. 2011. http://tigger.uic.edu/classes/phys/phys461/phys450/ANJUM01/lectures_aa.htm

Apollon, Willy, Danielle Bergeron, Lucie Cantin, Robert Hughes, and Kareen Ror Malone. *After Lacan Clinical Practice and the Subject of the Unconscious*. Albany: State University of New York, 2002. Print.

Barad, Karen Michelle. *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning*. Durham: Duke UP, 2007. Print.

Bernini, Gian Lorenzo. *The Ecstasy of Saint Teresa*. 1652. Comaro Chapel, Santa Maria della Vittoria, Rome. Photograph taken by Napoleon Vier. *Wikipedia*. Web. 21 Oct. 2011.

Boheemen, Christine Van. *Joyce, Derrida, Lacan, and the Trauma of History: Reading, Narrative and Postcolonialism*. Cambridge: Cambridge UP, 1999. Print.

Bohr, Niels. "Discussion with Einstein on Epistemological Problems in Atomic Physics." *Albert Einstein: Philosopher-Scientist*. Ed. Paul A. Schlipp. London: Cambridge UP, 1949. 199-242. Print.

Brivic, Shelly. *Joyce through Lacan and Zizek: Explorations*. New York: Palgrave Macmillan, 2008. Print.

Bucky, Peter. *The Private Albert Einstein*. Kansas City, Mo.: Andrews and McMeel, 1992. Print.

Butler, Judith. *Bodies That Matter: on the Discursive Limits of "Sex."* New York: Routledge, 1993. Print.

---. *Gender Trouble: Feminism and the Subversion of Identity*. New York: Routledge, 1990. Print.

"carcass | carcase, n.". OED Online. September 2011. Oxford University Press. 5 November 2011 <http://www.oed.com.proxy.library.emory.edu/view/Entry/27806?rskey=Kb6vz8&result=1&isAdvanced=false>.

"catechism, n.". OED Online. September 2011. Oxford University Press. 5 November 2011 <http://www.oed.com.proxy.library.emory.edu/view/Entry/28846?redirectedFrom=catechism>.

Chakravorty-Spivak, Gayatri. "Can the Subaltern Speak?" *Marxism and the Interpretation of Culture*. Ed. Cary Nelson and Lawrence Grossberg. Basingstoke: Macmillan Education, 1988. 271-313. Print.

Chiu, Charles S. *Women in the Shadows Mileva Einstein-Marić, Margarete Jeanne Trakl, Lise Meitner, Milena Jesenská, and Margarete Schütte-Lihotzky*. New York, NY: Lang, 2008. Print.

"Council of Trent." *Encyclopædia Britannica. Encyclopædia Britannica Online Academic Edition*. Encyclopædia Britannica Inc., 2011. Web. 05 Nov. 2011. <http://www.britannica.com.proxy.library.emory.edu/EBchecked/topic/604238/Council-of-Trent>.

Dawkins, Richard. "Postmodernism Disrobed." *Nature* 394 (1998): 141-43. *New York University Physics Department*. Web. 18 Nov. 2011. <http://www.physics.nyu.edu/sokal/dawkins.html>.

Einstein, Albert. "Autobiographical Notes." *Albert Einstein: Philosopher-Scientist*. Ed. Paul A. Schlipp. London: Cambridge UP, 1949. 1-96. Print.

---."Does the Inertia of a Body Depend on Its Energy-Content." 1905. Fourmilab. Ed. John Walker. 2001. Web. 15 Nov. 2011.

---. "Ether and the Theory of Relativity." 1920. *The Collected Papers of Albert Einstein.* Vol. 7. Trans. Alfred Engel. Princeton, NJ: Princeton UP, 2002. 161-82. Print.

---, comp. “From Marie Winteler, 30 Nov. 1896.” *The Collected Papers of Albert Einstein* (CPAE) *Volume 1: the Early Years, 1879-1902.* Trans. Anna Beck. Princeton: Princeton UP, 1987. Doc. 30, 30-31.Print.

---, comp. “From Mileva Maric, 20 Oct. 1897.” *The Collected Papers of Albert Einstein* (CPAE)

Volume 1: the Early Years, 1879-1902. Trans. Anna Beck. Princeton: Princeton UP, 1987. Doc. 36, 34-35. Print.

---. "Fundamental Ideas and Methods of the Theory of Relativity, Presented in Their Development." *The Collected Papers of Albert Einstein* (CPAE). Vol. 7. Trans. Alfred Engel. Princeton, NJ: Princeton UP, 2002. Doc. 31, 111-50. Print.

---. "On a Heuristic Point of View Concerning the Production and Transformation of Light." *Einstein's Miraculous Year: Five Papers That Changed the Face of Physics*. 1905. Comp. John J. Stachel. Princeton, NJ: Princeton UP, 1998. Web.

---. "On The Electrodynamics of Moving Bodies." *Einstein's Miraculous Year: Five Papers That Changed the Face of Physics*. 1905. Comp. John J. Stachel. Princeton, NJ: Princeton UP, 1998. Web.

---. *Out of My Later Years. [Essays]*. New York: Philosophical Library, 1950. Print.

---. “Physics and Reality.” *The Theory of Relativity, and Other Essays*. Secaucus, NJ: Carol Pub. Group, 1996. 16-52. Print.

---. *Relativity: The Special and General Theory*. Trans. Robert W. Lawson. Methuen & Co, 1916; *Project Gutenberg*, Feb. 2004. Web. 14 Oct. 2011.

---. "Remarks to the Essays Appearing in This Collective Volume." *Albert Einstein: Philosopher-Scientist*. Ed. Paul A. Schlipp. London: Cambridge UP, 1949. 663-688. Print.

---. "To Heinrich Zangger, 27 Dec. 1914." *The Collected Papers of Albert Einstein.* Vol. 10. Eds. Diana Kormos Buchwald, Tilman Sauer, Ze’ev Rosenkranz, Jozsef Illy, and Virginia Iris Holmes. Trans. Ann Hentschel. Princeton, NJ: Princeton UP, 2006. Doc. 41a, 13-15. Print.

---. "To Heinrich Zangger, 1 March 1916." *The Collected Papers of Albert Einstein.* Vol. 10. Eds. Diana Kormos Buchwald, Tilman Sauer, Ze’ev Rosenkranz, Jozsef Illy, and Virginia Iris Holmes. Trans. Ann Hentschel. Princeton, NJ: Princeton UP, 2006. Doc. 196a, 22. Print.

---. “To Mileva Marić, 27 March 1901.” *The Collected Papers of Albert Einstein Volume 1: the*

Early Years, 1879-1902. Trans. Anna Beck. Princeton: Princeton UP, 1987. Doc. 94, 160-161.Print.

---. "To Mileva Marić, May 1901." *The Collected Papers of Albert Einstein Volume 1: the Early Years, 1879-1902.* Trans. Anna Beck. Princeton: Princeton UP, 1987. Doc. 110, 173.Print.

---. "To Mileva Maric, 4 Feb. 1902." *The Collected Papers of Albert Einstein Volume 1: the Early Years, 1879-1902.* Trans. Anna Beck. Princeton: Princeton UP, 1987. Doc. 134, 191. Print.

---. "To Pauline Winteler." *The Collected Papers of Albert Einstein Volume 1: the Early Years, 1879-1902.* Trans. Anna Beck. Princeton: Princeton UP, 1987. Doc. 34, 32-33. Print.

---. *The World as I See It.* New York: Philosophical Library, 1949. Print.

Einstein, Albert, and Sigmund Freud. *The Einstein-Freud Correspondence (1931-1932). Why War?* 1933. *Arizona State University*. Trans. John M. Lynch. Web. 04 Nov. 2011.

Einstein, Albert, and Leopold Infeld. *The Evolution of Physics: the Growth of Ideas from Early Concepts to Relativity and Quanta.* New York: Simon and Schuster, 1938. Print.

Einstein, Albert, Karl Przibram, Erwin Schrödinger, Max Planck, and H. A. Lorentz. *Letters on Wave Mechanics Correspondence with H.A. Lorentz, Max Planck, and Erwin Schrödinger*. Trans. Martin J. Klein. New York: Philosophical Library, 2011. Print.

Einstein-Marić, Mileva. *In Albert's Shadow: the Life and Letters of Mileva Maric, Einstein's First Wife*. Ed. Milan Popović. Baltimore: Johns Hopkins UP, 2003. Print.

"Einstein's Wife: The Life of Mileva Maric-Einstein." *PBS: Public Broadcasting Service*. Web. 05 Nov. 2011. <http://www.pbs.org/opb/einsteinswife/science/mquest.htm>.

Ellmann, Richard. *James Joyce.* New York: Oxford UP, 1959. Print.

Fink, Bruce. "Knowledge and Jouissance." *Reading Seminar XX: Lacan's Major Work on Love, Knowledge, and Feminine Sexuality*. Ed. Suzanne Barnard and Bruce Fink. Albany, NY: State University of New York, 2002. 21-47. Print.

---. *The Lacanian Subject: between Language and Jouissance*. Princeton, NJ: Princeton UP, 1995. Print.

Freud, Sigmund. "Inhibitions, Symptoms, and Anxiety." *The Standard Edition of the Complete Psychological Works of Sigmund Freud*. Trans. James Strachey. Vol. 20. London: Hogarth, 1953-74.

Gendler, Tamar S. *Imaginary Exceptions: On the Powers and Limits of Thought Experiments*. Yale University, 1996. Web. <http://yale.academia.edu/TamarSzaboGendler/Papers/982910/Imaginary_exceptions_on_the_powers_and_limits_of_thought_experiment>.

Ghiselin, Brewster. *The Creative Process; a Symposium.* [New York]: New American Library, 1955. 32. Print.

Ghose, Aurobindo. *The Life Divine.* New York: Greystone, 1949. Print.

Gogarty, Oliver St. John. "James Joyce as a Tenor." *Intimations*. New York: Abelard, 1950. *Music in the Works of James Joyce*. Web.

Gordon, John. *Joyce and Reality: the Empirical Strikes Back*. Syracuse, NY: Syracuse UP, 2004. Print.

Haraway, Donna Jeanne. "A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century." *Simians, Cyborgs, and Women: the Reinvention of Nature*. New York: Routledge, 1991. 149-81. Stanford University. Web. 10 Oct. 2011.

Hawking, Stephen W. *A Brief History of Time: from the Big Bang to Black Holes*. Toronto: Bantam, 1988. Print.

Holland, Norman N. "The Trouble(s) with Lacan." *University of Florida*. Web.

Homer, Sean. *Jacques Lacan*. London: Routledge, 2005. Print.

Hook, Derek. *Lacan, the meaning of the phallus and the 'sexed' Subject*. London: LSE Research Online. 2006. Web. 21 Oct. 2011.

Isaacson, Walter. *Einstein: His Life and Universe*. New York: Simon & Schuster, 2007. Print.

Johnson, Jeri. “Appendix A: The Gilbert and Linati Schemata.” *Ulysses*. By James Joyce. Oxford: Oxford UP, 1993. 734-739. Print.

---. “Explanatory Notes.” *Ulysses*. By James Joyce. Oxford: Oxford UP, 1993. 763-980. Print.

---. "Introduction." *Ulysses*. By James Joyce. Oxford: Oxford UP, 1993. ix-lvi. Print.

Joyce, James. *Ulysses*. Ed. Jeri Johnson. Oxford: Oxford UP, 1993. Print.

---. *The Critical Writings of James Joyce*. Eds. Ellsworth Mason and Richard Ellmann. Ithaca, NY: Cornell UP, 1989. Print.

---. *Selected Letters of James Joyce*. Ed. Richard Ellmann. New York: Viking, 1975. Print.

Joyce, Stanislaus. *My Brother's Keeper*. London: Faber and Faber, 1958. Print.

Keller, Evelyn Fox. *Reflections on Gender and Science*. New Haven: Yale UP, 1985. Print.

King James Bible. 1672. *Google Books*. Hayes Barton Press. Web. 04 Nov. 2011. <http://books.google.com/books?id=HLi6yqmDc5sC&dq=king+james+bible&source=gbs_navlinks_s>.

Kragh, Helge. *Quantum Generations: a History of Physics in the Twentieth Century*. Princeton, NJ: Princeton UP, 1999. Print.

Kumar, Manjit. *Quantum: Einstein, Bohr, and the Great Debate about the Nature of Reality*. New York, NY: W.W. Norton & Co., 2009. Print.

Lacan, Jacques. *Ecrits*. Trans. Alan Sheridan. New York, NY: W.W. Norton & Co., 1977. Print.

---. *The Seminar of Jacques Lacan: Freud’s Papers on Technique, 1953-1954*. Ed. Jacques-Alain Miller. Trans. John Forrester. Seminar I. New York, NY: W.W. Norton & Co., 1991. Print.

---. *The Seminar of Jacques Lacan: The Ego in Freud's Theory and in the Technique of Psychoanalysis, 1954-1955*. Ed. Jacques-Alain Miller. Trans. John Forrester. Seminar II. Cambridge: Cambridge UP, 1988. Print.

---. *The Seminar of Jacques Lacan: the Psychoses, 1955-1956.* Ed. Jacques-Alain Miller. Trans. Russell Grigg. Seminar III. New York, NY: W. W. Norton & Co., 1997. *Google Books*.

Web.

---. *The Seminar of Jacques Lacan: The Formations of the Unconscious, 1957-1958.* Ed. Jacques-Alain Miller. Trans. Cormac Gallagher from unpublished French typescripts. Seminar V. *Lacan in Ireland*. Web. 14 Nov. 2011. <http://www.lacaninireland.com/web/?page_id=123>.

---. *Encore: On Feminine Sexuality: the Limits of Love and Knowledge, 1972-1973*. Seminar XX. Ed. Jacques-Alain Miller. Trans. Bruce Fink. New York, NY: W. W. Norton & Co., 1998. Print.

Lawrence, Karen. *The Odyssey of Style in Ulysses*. Princeton, NJ: Princeton UP, 1981. 203-10. *The James Joyce Scholars' Collection*. University of Wisconsin. Web.

Lemaire, Anika. *Jacques Lacan*. London: Routledge & Kegan Paul, 1977. Print.

Maddox, Brenda. *Nora: the Real Life of Molly Bloom*. Boston: Houghton Mifflin, 1988. Print.

Margenau, Henry. "Einstein's Conception of Reality." *Albert Einstein: Philosopher-Scientist*. Ed. Paul A. Schlipp. London: Cambridge UP, 1949. 243-268. Print.

Miller, Jacques-Alain. "You Are the Woman of the Other and I Desire You." *Lacan.com*. Web. 03 Nov. 2011. <http://www.lacan.com/essays/?page_id=331>.

Newman, Robert D., and Weldon Thornton. *Joyce's Ulysses: the Larger Perspective*. Newark: University of Delaware, 1987. Print.

Norton, John D. "Einstein's Pathway to Special Relativity." *University of Pittsburgh*. Web. 05 Nov. 2011.

---. "How Hume and Mach Helped Einstein Find Special Relativity." *Synthesis and the Growth of Knowledge: Essays at the Intersection of History, Philosophy, Science, and Mathematics*. Ed. Michael Dickson and Mary Domski. Open Court. Web. *Einstein For Everyone*. 16 Oct. 2011.

---. "Magnet and Conductor." *Einstein for Everyone*. University of Pittsburgh. Web. 03 Nov. 2011.

Oh, Jea Suk. "A Study of Kristeva and Irigaray's Critiques on Phallogocentrism." *Cerebration*. Web. 03 Nov. 2011. <http://www.cerebration.org/jeasukoh.html>.

Olivelle, Patrick. *Upaniṣads*. Oxford: Oxford UP, 1996. Print.

Orr, Leonard. *Joyce, Imperialism, & Postcolonialism*. Syracuse: Syracuse UP, 2008. Print.

Perkowitz, Sidney. *Empire of Light: a History of Discovery in Science and Art*. New York: Henry Holt, 1996. Print.

Prabhavananda, and Frederick Manchester. *The Upanishads, Breath of the Eternal: the Principle Texts Selected and Translated from the Original Sanskrit*. New York: New American Library, 1957. Print.

Rabaté, Jean-Michel. "Preface and Chronology of Lacan's Life." Preface. *The Cambridge Companion to Lacan*. Cambridge, U.K.: Cambridge UP, 2003. Xi-Xxviii. Print.

Roughley, Alan. *Reading Derrida Reading Joyce*. Gainesville: University of Florida, 1999. Print.

Russell, Bertrand. *The ABC of Relativity.* London: G. Allen & Unwin, 1958. Print.

Schrödinger, Erwin. *Science Theory and Man: (formerly Published under the Title, Science and the Human Temperament)*. NY, NY: Dover Publications, 1957. Print.

Scott, Bonnie Kime. *Joyce and Feminism*. Bloomington: Indiana UP, 1984. Print.

"scripture, n.". OED Online. September 2011. Oxford University Press. 5 November 2011 <http://www.oed.com.proxy.library.emory.edu/view/Entry/173593?rskey=L6z2Ut&result=1&isAdvanced=false>.

Smolin, Lee. *The Trouble with Physics: the Rise of String Theory, the Fall of a Science, and What Comes next*. Boston: Houghton Mifflin, 2006. Print.

Sokal, Alan D., and J. Bricmont. *Fashionable Nonsense: Postmodern Intellectuals' Abuse of Science*. New York: Picador USA, 1998. Print.

Spoo, Robert E. *James Joyce and the Language of History: Dedalus's Nightmare*. New York: Oxford UP, 1994. Print.

Verhaeghe, Paul, and Frédéric Declercq. "Lacan's Analytical Goal: "Le Sinthome" or the

Feminine Way." *Re-inventing the Symptom: Essays on the Final Lacan*. Ed. Luke Thurston. New York: Other, 2002. 59-83. Print.

Wertheimer, Max. *Productive Thinking.* New York: Harper, 1959. Print.

Žižek, Slavoj. "The Real of Sexual Difference." *Reading Seminar XX: Lacan's Major Work on Love, Knowledge, and Feminine Sexuality*. Ed. Suzanne Barnard and Bruce Fink. Albany, NY: State University of New York, 2002. Print.

Zuern, John. "Lacan: The Mirror Stage." *Department of English*. University of Hawaii. Web. 05 Nov. 2011. <http://www.english.hawaii.edu/criticalink/lacan/guide1.html>.