THE SCIENCE OF FAILURE:
SAMUEL BECKETT AND HENRI POINCARÉ

by

WELDON PLESS

(Under the Direction of Adam Parkes)

ABSTRACT

In this thesis I investigate Henri Poincaré’s *The Value of Science*, which Samuel Beckett read in the 1930s, and argue its importance in Beckett’s early novels. By looking closely at *The Value of Science*, I show a few philosophical arguments that influenced Beckett’s thoughts on science and scientific language. I then turn to the novel *Murphy*, arguing that Beckett moves beyond interpolation and integrates a number of Poincaré’s ideas into the text. Finally, I examine *Watt*, exploring in particular the influence of Poincaré’s conventional epistemology.

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For Corynne, whose love gives me the strength to try, whose support gives me the courage to fail, and whose patience gives me the grace to fail better.
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INTRODUCTION:
SAMUEL BECKETT AND SCIENCE

As the titular character of Samuel Beckett’s *Watt* stares at a geometric painting of a broken circle and a point, he imagines that these shapes search for each other, the circle incomplete without its missing center. In doing so, he invokes metaphors of physics in the already geometric space, imagining that the shapes exist “in boundless space, in endless time” (273). Such language must be farce in his mouth, though, for as the narrator explains, “Watt knew nothing about physics” (273). It seems the same cannot be said of his creator, for Beckett riddles his fiction with allusions that reveal at the very least a cursory understanding of scientific and mathematical fields, and most certainly a range of research into specific theories and principles. For example, Angela Montgomery points out that the orbitals of Watt—like the servants who revolve at specific levels around the nucleus of Mr. Knott—bear striking resemblance to the structure and “jumpiness” of electrons theorized by Planck and Bohr, from which he also borrowed phrases like “packets” and “quanta” (176-177). Later in *Watt*, Beckett displays a useful number theory trick for finding cube roots, which is mathematically accurate (though its employer in the novel makes numerous mistakes) (Howard 347). In *Murphy*, the single-line paragraph “Matrix of surds” refers not only to a specific class of irrational numbers, but also to the destabilizing contemporary theories of Werner Heisenberg (Ellis 123). This application of mathematical and systems persists into Beckett’s later career, like the teleplay *Quad* which employs what mathematician Brett Stevens calls “a purgatorial calculus” (164), or
the neurological references that abound, from *Murphy* to *Footfalls*. Beckett often references Venus, a planet of which he was particularly fond, throughout his oeuvre—from *Murphy* to *The Unnamable* to *Ill Seen Ill Said*. Of course, to continue to list these references would be exhausting, ultimately impossible, and perhaps unproductive. As Hugh Culik recently commented, a list of specialized medical references in Beckett’s work runs some 49 single-spaced pages, and a general scientific or mathematical list would undoubtedly run much longer (“Science and Mathematics” 348).

More compelling questions might be how Beckett uses these references, and indeed where he came about his knowledge in the first place. As to the first question, a few recent studies offer insightful theories on the method and manner of Beckett’s scientific reference, nearly all of them centering on the ways science, math, and other systemized languages fail in their quest to express the world. Most recently Culik suggests that Becket often simultaneously draws from two scientific discourses that compete to express the same phenomena, like astronomy and astrology or psychology and psychoanalysis, to ultimately suggest the incompleteness of insufficiency of both systems (349).

The second question—where Beckett acquired his scientific knowledge—will shed light on the first. Beckett took only the required math and science courses while at Trinity, courses in Geometry and Algebra, and Knowlson recounts that he was an average student at best (69). However, in an extended period of research that occurred in the late 30s, a period of self-directed study that included philosophy, music, mythology, drama, art, and mathematics, Beckett showed a very real interest in the scientific. Since he kept careful notes during this period, we can trace a number of the texts that helped build his knowledge. Additionally, Mark Nixon and Dirk Van
Hulle recently excavated the remains of Beckett’s library, and from their careful documentation we can fill in some gaps in our knowledge of Beckett’s reading.

One pattern that emerges from these sources is Beckett’s sincere interest in the stars and the planets. Beckett titled his reading journal “Whoroscope,” and the punning title reveals his fascination with astrological interpretations of celestial bodies. The horoscope was of particular interest to Beckett in the 30s, as he had recently discovered the work of C. G. Jung, who administered horoscopes to all his patients. Beckett noted that the horoscope could act in Murphy as a controlling force for the protagonist, and the novel makes frequent direct reference to astrological signs and motivations (Knowlson 197). Alongside this astrological interest is of course the astronomical. Beckett’s bookshelves were adorned with astronomy books such as The Universe Around Us, Les Mondes lointains, and Explorations duciel, and he also carefully read mathematical works describing planetary movement, like Minchin’s Student Dynamics (Van Hulle/Nixon 206-207). He took extensive notes on the planets in his notebooks, carefully documenting the atmospheric particulars of the planets, and noting the eventual possibility of life on Venus—a question he pursued later by reading “Is There Life on Other Worlds” by Spencer Jones (207).

It is perhaps this interest in the cosmos that lead Beckett to read Henri Poincaré’s The Value of Science, a text he took seriously, writing 7.5 pages of handwritten notes in his Whoroscope Notebook (Montgomery 175). Poincaré, himself a pioneer in astronomical research, begins the work with a discussion of celestial mechanics, tracing the roots of all science to the ancient study of the stars. What follows, however, is a philosophical investigation of the usefulness of science and the way it informs notions of epistemology more generally. This work
influenced Beckett far more than has been noticed, and in the following chapters I will closely investigate Poincaré’s *The Value of Science* and the influence it had on Beckett’s early novels.

In the first section, “Fail again. Fail Better,” I give an account of the major ideas in Poincaré’s book, and argue that his project, like Beckett’s, often embraces the failures of science as sites of true progress. *The Value of Science* traces a history of crises in science, and suggests that the “truths” of science are in truth simply convenient explanations, an aggregate of theories that best fit the outside world. In the second section, “From Interpretation to Integration,” I take Beckett’s novel *Murphy* and suggest a few strains of Poincaré’s influence that appear in that work, first as mere allusion but ultimately as ideas incorporated into the novel’s makeup. The common theory in Beckett studies is that Beckett read Poincaré and other scientists merely as sources “for interpolation,” texts from which he could draw allusions in his work. By looking at the way Poincaré’s ideas appear in *Murphy*, I will argue that the relationship between the two is much more intimate. Finally, in the chapter entitled “Conventionalism and Connection,” I will investigate *Watt*, and the residue of *The Value of Science* that persists in that work. Beckett did not have his notes on Poincaré when he wrote this novel, and probably had not read him for a decade. As I show, there still remains a real presence of Poincaré’s thought, and I suggest that Poincaré’s conventionalism in particular plays a role in the epistemological argument of that novel.

“The danger is in the neatness of identifications;” so goes the old Beckett studies refrain. My goal is not to force Poincaré onto Beckett, as if to suggest that Beckett’s work allegorizes the scientist’s ideas, or that *The Value of Science* is the hidden key to Beckett’s obscure lock. Poincaré quips that if the essence of life is in its smallest part, then zoologists might be better served to study an elephant with a microscope. Likewise, by applying *The Value of Science* as a
lens through which I view Beckett’s work, I do not claim to unlock, diagnose, or explain away the complexities of two beautifully difficult novels. Instead, I hope that this thesis lends more historical context to Beckett’s early works, tethering them in a sense to one strain of scientific conversation with which he was quite familiar. Like Mr. Kelly’s kite line at the end of *Murphy*, such a tether can help to reconcile the known and the unknown, to “measure the distance from the seen to the unseen.” Kelly’s is an “unscientific observation,” we are told, “so many and so fitful were the imponderables involved” (167), and the same might be said of this study. Poincaré’s influence on Beckett, however, will become apparent, and from it we can better understand the meaning and implications of both *Murphy* and *Watt*. To my knowledge there have been no investigations of this influence, a gap in Beckett studies that this thesis begins to mend.
“...there are indications of a serious crisis [in modern physics], as if we might expect an approaching transformation. Still, be not too anxious: we are sure the patient will not die of it, and we may even hope that this crisis will be salutary, for the history of the past seems to guarantee this.”

-Poincaré, The Value of Science

“… thanks be to God and Poincaré...”

-Beckett, ‘Les Deux Besoins’

Dubbed “a universal specialist,” Henri Poincaré’s vast body of work possesses a nearly unparalleled depth and variety, and he left in his wake new branches of mathematics (such as automorphic functions and algebraic topology), a renovated view of celestial mechanics, and the foundations of the theory of special relativity. His popular writings on science were widely read during and after his lifetime, in the cafes of Paris and throughout the world, translated as they were in over 20 languages (Charpentier 2). It was these popular writings that met the most diverse audience, written with digestible style and accessible language in a way that even the non-professional could understand. It was here too that his philosophy of science emerged as a powerful voice in the epistemological debates of the early 20th century, debates that often sprung from the very destabilizing advances in mathematics and physics which Poincaré helped generate. As Jeremy Gray points out, his philosophy was integral to his scientific work, and, “to a remarkable degree, Poincaré was guided in his mathematical and scientific work by his philosophical reflections” (6). His philosophical writing was imaginative, often neglecting the inclusion of mathematical proofs, and inspired a wide range of thinkers in various fields.
Psychologist Édouard Toulouse called it “spontaneous, little conscious, more like dreaming than rational, seeming most suited to works of pure imagination,” and Poincaré’s philosophy of science notably influenced 20th century artists like Picasso and Duchamp (Quoted from Ottino 52).

It was as a philosopher of science that Beckett encountered Poincaré in the late 30s, through Poincaré’s lovely *The Value of Science*. It is possible that Beckett himself only read the book in search of scientific facts to interpolate into his writing, lending layers of mystery to the work in the Joycean mode (Ackerley, *Grove Companion* 646). Many of Beckett’s notations were composed, “FOR INTERPOLATION,” as indicated by the Whoroscope Notebook, and thus Beckett scholars have mostly overlooked any real influence the polymath had on the young writer. In fact, almost every reference to Poincaré in Beckett scholarship works simply to prove Beckett’s interest in advanced mathematical physics and celestial mechanics, undoubtedly a valid claim. But as I will argue, Poincaré’s ideas play a major role in the creation of Beckett’s early fiction, and in later chapters I will investigate the residue of Poincaré’s influence as it appears in *Murphy* and *Watt*. First, however, I will look closely at the major elements of *The Value of Science*, which Beckett read carefully sometime between 1932 and 1938, and show how Poincaré’s work uses the failures of science to build an epistemology based on scientific conventionalism.

The introduction to *The Value of Science* begins in a way that probably interested young Beckett, with a sentiment that seems more appropriate to *Endgame* than a text on mathematical physics. Arguing that the search for truth is more valuable to the human race than even the quest to end human suffering, Poincaré asserts, “Not to suffer is a negative ideal more surely attained by the annihilation of the world” (11). And as such axioms perhaps indicate, the book that

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1 I will refer throughout to the translation by George Bruce Halstead, which Poincaré authorized and introduced.
follows is as much a philosophical text as a scientific one, as Poincaré quickly lays out the problem of perception where philosophy and science converge:

Does the harmony the human intelligence thinks it discovers in nature exist outside of this intelligence? No, beyond doubt, a reality completely independent of the mind which conceives it, sees or feels it, is an impossibility. A world as exterior as that, even if it existed, would for us be forever inaccessible. (14)

Already a paradox looms over Poincaré’s writing, that we must search for truth though it is by nature wholly inaccessible, a “phantom…that must be pursued further and ever further without ever being attained” (Poincaré 11). Like Beckett’s dueling waltz of “Nohow” and “Somehow on,” this is a charge to continue into the impossible.

Poincaré summons in his introduction a historical referent that acts, in a sense, as a controlling symbol for much of what follows. Contemporary theories of modern physics, he explains, evolved from the observation of planetary motion. “It was altogether natural… that celestial mechanics should be the first model of mathematical physics” (13), writes Poincaré, and because of that model science continued to seek grand laws that matched “the material grandeur” of the universe. A discussion of planetary motion would interest Beckett in the 30s. His fascination with celestial motion—orbits, specifically—informs the structure of his novels, like the circular Molloy, or the revolutions of The Unnamable. And as Chris Ackerley has noted, Beckett copied from Poincaré’s introduction a rather poetic line about orbitals—“Ces astres infinitement petits, ce les atomes” (infinitely small stars, that’s what the atoms are)—which reappears in various ways throughout his oeuvre (15). But Poincaré’s goal with the invocation of astronomy is that faith in the immutable scientific law, inherited from ancient astronomy, still pervades contemporary scientific thought. This worries Poincaré, not because he distrusts law,
but because he believes we could never verify it unequivocally: “[S]cientific laws are not artificial creations; we have no reason to regard them as accidental,” he explains, “though it may be impossible to prove they are not” (14). From here Poincaré turns to his first major topic in *The Value of Science*, the roll of logic and intuition in mathematics.

Each branch of mathematics, Poincaré believes, contains somewhere in its history an element of intuition. While his contemporaries Bertrand Russell and Alfred North Whitehead sought to create an axiomatic system of mathematics that could derive solely from logic, Poincaré did not share their faith in logicism. He explains,

> pure logic could never lead us to anything but tautologies; it could create nothing new; not from it alone can any science issue… [T]o make arithmetic, as to make geometry, or to make any science, something else than pure logic is necessary. (19)

In fact all logical systems, though they may appear insular, begin with an intuitive leap from outside the system. For example,

At its outset, [a continuous function] was only a sensible image, for example, that of a continuous mark traced by the chalk on a blackboard. Then it became little by little more refined; ere long it was used to construct a complicated system of inequalities, which reproduced, so to speak, all the lines of the original image; this construction finished, the centering of the arch, so to say, was removed, that crude representation which had temporarily served as support and which afterwards was rejected; there remained only the construction itself, irreproachable in the eyes of the logician. (22)
The mere simulacrum that remains is, to twist Beckett’s words, all circumference and no center. Of course, the historical move from intuition to logic had a legitimate purpose, for as Poincaré points out, intuition cannot offer certainty. The problem arises when logic becomes a language of mythological absolutes, when, untethered from the physical world, it attracts the faith of those seeking a perfect and complete mathematical system. Logic tends to lose its connection to the world, and thus loses its power to explain the world around us. “[I]n becoming rigorous,” Poincaré explains, “Mathematical science takes a character so artificial as to strike every one; it forgets its historical origins; we see how the questions can be answered, we no longer see how and why they are put” (21). Logic has its place, but it cannot function in a useful manner when detached from intuition.

Poincaré does not suggest, however, that linkage with the physical world will lend science any ultimate stability, nor is stability his ultimate goal. On the contrary, the physical world is an unruly place, and even the most astute scientist stumbles, like Watt, “in the midst of shadowy substance” (Beckett 355). Poincaré allows that this substance might make up an ordered universe, but he also argues that man could never access it directly. As Gray explains, “Poincaré argued that we had every reason to believe the universe was intelligible, but could never know what it was ‘truly’ like” (7). Nonetheless, The Value of Science displays an undaunted confidence in science even as Poincaré exposes its shortcomings, because for him science can still offer flickers of seeing, even if through a darkened glass. “Thought is only a gleam in the midst of a long night,” he writes, “But it is this gleam which is everything” (142).

To prove the fundamental inaccessibility of the world, he uses problems of measurement that illustrate the impossibility of attaining exactitudes in science. Measurement always leads to absurdity; all it takes is a change of scale. For example, Poincaré explains, imagine two objects
similar in size. Object A equals 10 grams, object C equals 12. Now, using only the senses, one may be able to discern the weight difference between the two; however, if an object (B) is introduced that weighs 11 grams, it might be impossible to distinguish B from either A or C. Therefore, applying crude sensory measurements, one would have to say that \( A = B \) and \( B = C \), yet \( A \neq C \) — a fundamental break from Euclidean mathematics. To right this wrong, a more sophisticated measurement system must be applied. Such a problem could persist, as Poincaré points out, on and on as the measurement scale contracts. In other words, not only does scale show us the impossibility of correct measurement, it allows apparent breaks with our mathematical systems. Benoit Mandelbrot would later build on Poincaré’s ideas to create fractal geometry, and he explains the same problem of measurement by asking readers a deceptively simple question: How long is the coastline of Britain? To measure it in miles will yield a result different than in yards, in feet, in inches, and so on, never giving an exact distance but always an approximation (Hayles 309).

Poincaré’s discussion of movement exposes a similar anxiety about the accuracy of measurement, especially when we try to calculate or express the speed of bodies in motion. For example, we can never observe a “still” object, for stillness is impossible; even a hat on a table moves 30 kilometers per second with the rotation of the earth. Poincaré writes, “We can not know whether an object … has not changed its absolute position in space, and not only can we not affirm it, but this affirmation has no meaning and in any case can not correspond to any representation” (46). But scientists do measure, and they must. Poincaré simply cautions against the belief that the physical sciences might reveal absolute truth, since the foundational measurements upon which so many theorems are based are necessarily approximate.
As a final example, Poincaré discusses the utter absurdity of viewing time as something that can be objectively measured. The only time that we could ever truly quantify intuitively might be internal, “psychologic time”:

So long as we do not go outside the domain of consciousness, the notion of time is relatively clear. Not only do we distinguish without difficulty present sensation from the remembrance of past sensations or the anticipation of future sensations, but we know perfectly well what we mean when we say that, of two conscious phenomena which we remember, one was anterior to the other; or that, of two unforeseen conscious phenomena, one will be anterior to the other. (26)

But to claim that two external moments are of equal time has no meaning, and “The persons who believe they possess this intuition are dupes of an illusion” (27). To prove this claim, he shows how every time keeping device must ultimately rely on approximation, if not pure assumption. The pendulum, the rotation of the earth, and the orbits of the planets all represent approximate versions of time, and measurement via these methods is undeniably uncertain. Even the speed of light—assumed to be constant in all directions at all times—can only be derived through mathematical equations that involve time measurement, and thus the problem remains.

One could argue that though the devices for time keeping are flawed, the ideal of absolute time might be conceived, and thus lend rigor to the definition. Poincaré argues that even if we could imagine a perfect, theoretical timekeeping device, such a device is categorically impossible. For to imagine absolute time, time that is applicable to all things in all places (and on all trajectories, astronomically speaking), is to imagine a speedometer hurtling through space that would measure the speed of all the planets. The obvious inherent question of relativity thus appears: compared to what? We cannot ever know an absolute time, nor can we intuit it. Instead
we simply create convenient rules that help us express approximate and ultimately local time. There is “[n]o general rule, no rigorous rule,” but instead, “a multitude of little rules applicable to each particular case” (36). Our failure to access the world around us forces us then to choose rules, “not because they are true, but because they are the most convenient” (36). And, as Poincaré argues in the second part of *The Value of Science*, it has always been this way.

Part II of *The Value of Science* moves into a broader discussion of mathematical physics and its historical origins. It is from this section that Beckett took most of his notes, particularly the Chapters “The History of Mathematical Physics” and “The Present Crises of Mathematical Physics” (Montgomery 172). Poincaré offers a brief history of celestial mechanics, and, as with the former section, he gravitates towards moments of scientific breakdown. It is important to note that Poincaré’s “history of mathematical physics” recounts not a history of discovery or invention, but rather a history of crises. He sees in his present moment of science an impending crisis, and explains that “to understand it, it is important to recall those which have preceded” (91). This fundamental aim of the chapter changes the common perception of Beckett’s notes and reading, since Poincaré’s history chronicles a series of failures. Even as Beckett copies down the law of the conservation of energy, which will show up often in his work, he encounters it as a part of a narrative of crisis and breakdown.

The first crisis Poincaré describes is the dissolution of the idea of absolute physical laws. Following Newton, a physical law was at one time thought to be “an internal harmony, static, so to say, and immutable” (93). Newton’s laws of motion were thought to apply to every object in the universe, and science was built on the assumption that the universe operated under the stricture of such laws. “Nevertheless,” explains Poincaré, “a day arrived when the conception of central forces no longer appeared sufficient,” ushering in the first crisis of mathematical physics.
Scientists abandoned the idea of the immutable law, and instead “[took] as guides certain principles” which would allow study of the universe. “These principles are results of experiments boldly generalized” Poincaré writes, “but they seem to derive from their very generality a high degree of certainty” (94). In this second stage of science, principles that prove most generally certain are used as tools rather than laws. These principles, like the conservation of energy and matter, give scientists a system for analyzing the physical world. And so, emerging from the Newtonian period of laws into the second period of principles, we now think of principles as “experimental truths” (93).

The “present crisis,” for Poincaré, involves these principles, and contemporary discoveries that seem to unsettle them. He discusses instances of instability in various long-respected axioms, such as Newton’s principle of action and reaction, which breaks down on the atomic level, or Mayer’s principle of the conservation of energy, which seems undone by the inexhaustible energy of radioactivity. Poincaré shows that the principles fundamentally relied upon in scientific research have been, and may soon be, overturned by further research and experiment, which may lead to a second crisis of mathematical physics. This will be shown in time, Poincaré believes, and, “While waiting, our doubts remain” (Poincaré 105).

In the face of such doubt, what can science offer? Absolute truth may not be accessible, just as absolute time and absolute space are not, but Poincaré still sees science as a hopeful and altogether useful enterprise, because it offers *objectivity*. For Poincaré, objectivity signals relationships, which are integral to his understanding of scientific knowledge:

Nothing is objective except what is identical for all; now we can only speak of such identity if a comparison is possible, and can be translated into a ‘money of exchange’ capable of transmission from one mind to another. Nothing, therefore,
will have objective value except what is transmissible by ‘discourse,’ that is, intelligible. (137)

For anything to be objective, it must be both common to many minds and transmittable from one mind to another, and science creates a language through which rational beings can find objectivity. “All the scientist creates in a fact,” Poincaré argues, “is the language in which he enunciates it” (121, italics his). This language allows people to build from common sensory experience to express the phenomena of the physical world. When Galileo and the Grand Inquisitor disagreed, it was not a disagreement of the senses—both perceived similar phenomena. Instead, it was the language they used to express the phenomena, their implementation of discourse. To Poincaré, this was not a disagreement of fact, but rather a disagreement of interpretation, and furthermore, neither interpretation could ever be called truer than the other, but simply more convenient. This is Poincaré’s belief about all science—it offers the most convenient truths, not absolute truth. He explains, “Therefore this affirmation, the earth turns round, has no meaning… or rather these two propositions, the earth turns round, and, it is more convenient to suppose that the earth turns round, have one and the same meaning” (140). According to Poincaré, this does not remove objectivity from science, but rather reinforces it. “To say that science can not have objective value since it teaches us only relations,” he explains, “this is to reason backwards, since, precisely, it is relations alone which can be regarded as objective” (137).

Poincaré’s work endures now because it tackles the issues of knowledge and epistemology that transcend specific scientific periods, and this helped shape Beckett’s forming attitude toward scientific knowledge. As Gray argues, “[Poincaré’s] reflections on how the best science of his day seemed to be crumbling in the face of almost inexplicable laboratory results
speaks to anyone concerned about how theories change (as they do)” (13). It is not surprising that Beckett was drawn to an account of scientific progress through the apparent disintegration of science itself, and the account parallels Beckett’s own project with language. Poincaré’s history of mathematical physics shows that each phase of science has been and will be wrought with failure. But each failure fails better, building upon the last and forever moving parabolically toward an unattainable truth. “This is little,” Poincaré admits, “but it is enough” (115). Perhaps Beckett saw something of his own budding aesthetic in *The Value of Science*, and undoubtedly he sympathized with “[Poincaré’s] hostility to logicism and his deep distrust of the rising axiomatic set theory” (Gray 13). In what follows I will suggest a number of ways in which Beckett integrated *The Value of Science* into his own thinking and writing, particularly the novels *Murphy* and *Watt*. 
CHAPTER 2
FROM INTERPOLATION TO INTEGRATION: MURPHY

“For a being completely immovable there would be neither space nor geometry; in vain would exterior objects be displaced about him...”
- Poincaré, The Value of Science

“He did not move. He was a point in the ceaseless unconditioned generation and passing away of a line.”
- Beckett, Murphy

Chris Ackerley has recently argued that Murphy is a “geometric novel,” as it incorporates both geometric figures (the dodecahedron, “Round Pond”) as well as metaphorical geometries:

Christ and the two thieves are defined as vertices of a triangle through which the perfect circle of God must pass; and Wylie insists that “Our medians... meet in Murphy (Murphy 127), that is, at the centre of an inscribed circle, which intimates that they (Neary, Wylie, Miss Counihan) want to enclose Murphy within the triangle of their lives. (Debts and Legacies 93)

The novel could just as easily be called astronomical, though, or even astrological (See Kennedy’s Murphy’s Bed for intensive study of both). Murphy’s first chapter begins with the sun, astrologically defined: “in the Virgin again for the billionth time” (3); the third begins with the moon, this time in more scientific language: “29,000 miles nearer the earth than it had been for four years” (19),² and the back-and-forth continues between the two modes of celestial observation throughout the novel. Hugh Culik notes Beckett’s systematic inclusion of such

² As Kennedy notes (Murphy’s Bed), this figure is incorrect, and the incorrectness seems intentional—“very rightly wrong,” as Beckett might say. Multiple sources Beckett consulted could’ve righted this wrong, yet Beckett knowingly keeps it.
disciplines in *Murphy*, peering closely at the recurring medical allusions in the novel. Culik traces this strategy back to Beckett’s early critical essays, in which he praised Proust and Joyce for their ability to “employ abstract ideas or systems as servants of artistic technique” (“Mindful of the Body” 84).

The overall density of allusions in *Murphy* has caused critics, not unfairly, to think of the novel as “a grab bag of Beckett’s reading” (Cohn 84). This “reading” was most concentrated in the 1930s, when Beckett consumed a variety of works and took abundant notes in what has been called the Whoroscope Notebook. The name *Whoroscope* stuck, in part because Beckett wrote the word in large letters in the inside cover, but also because most of the early notes are of an astrological nature. The influence of this period of reading is nowhere more apparent than in *Murphy*, and as John Pilling suggests “the *Murphy* notebook” might be a more accurate title for the collection of notes and fragments that built toward that seminal novel (*Ideal Core* 2).

The notebook contains Beckett’s 7.5 pages of notes on Henri Poincaré’s *The Value of Science*, and that work’s concern with astronomy and the mathematical physics derived from the study of planets in motion makes its inclusion unexceptional, situated as it is among notes on the stars, planets, and celestial physics. So far in Beckett studies, references to Poincaré mostly serve to simply prove Beckett’s knowledge of scientific principles and theories, and *The Value of Science* usually gets mentioned alongside less philosophical works like Minchin’s *Student Dynamics* or Jeans’s *The Universe Around Us*. Perhaps this stems in part from Beckett’s own heading in the Whoroscope Notebook, which lumps numerous notes into a section of texts “FOR INTERPOLATION” (Pilling, “FOR INTERPOLATION,” 1). This categorization suggests to many that Beckett read Poincaré as a scavenger, extracting only the passages that might be useful as references in *Murphy*. Joyce called this “notesnatching,” and indeed it was also a common
practice for Beckett in his early career (Nixon 11). Alternatively, Angela Montgomery cites Beckett’s notes simply as proof that he was “familiar with the history of mathematical physics” presented in The Value of Science (172), and numerous other critics follow her lead (Restivo 108, Jankov 49, and others). Ackerley often notes the way Beckett interpolated a single metaphor from Poincaré: “Infinitely small atoms, that’s what the stars are,” and in particular the way this metaphor plays out in The Unnamable (SB and Mathematics 15, Debts and Legacies 102 and elsewhere).

I contend, however, that Poincaré’s work influences Beckett in a very different way than Encyclopedia Britannica, for example, or James Jeans’ The Universe Around Us, from which Beckett drew numerous notes for interpolation into Murphy. As I explained in the previous chapter, Poincaré’s is as much a philosophical work as a scientific one, and Beckett does not simply interpolate facts from The Value of Science; he integrates Poincaré’s ideas and writing into the novel in a way unnoticed so far in Beckett studies. I will look at three particular moments from Murphy in which Poincaré’s influence is perhaps clearest: the chess game with Mr. Endon, Murphy’s famous rock, and Mr. Kelly’s kite-flying excursion.

Chess was a lifelong passion of Beckett’s, and upon his death his library contained over a dozen book-length works on its strategy and history (Nixon 261-287). He was an officer in the chess club at Trinity, played often with friends and family (notably with Marcel Duchamp), and studied the masters (Ackerley, Grove Companion 95). The game often finds its way into his fiction as well, and acts as a useful metaphor throughout his oeuvre, perhaps due to the dichotomy in the game between restricted, regulated movement and an imaginative strategic freedom (Ackerley 95). Neil Taylor and Bryan Loughrey suggest that chess reflects Beckett’s interest in “a tension between the mania for symmetry and mathematical permutation, which
rejects organic processes and a compulsion towards the asymmetry of living, which connives the linear passage of time” (72). Thus the presence of Beckett’s most memorable chess match in the climax of *Murphy* makes perfect sense, yet the inspiration for the game’s strangeness reveals a debt to Poincaré’s use of a chess metaphor in *The Value of Science*.

For Poincaré, logic alone leads to exhaustion, not discovery. “Pure analysis,” he explains, “puts at our disposal a multitude of procedures whose infallibility it guarantees; it opens to us a thousand different ways on which we can embark in all confidence; we are assured of meeting there no obstacles…” (22). The sheer amount of possibilities is therefore paralyzing, because logic alone cannot differentiate between two similar paths. It offers clear pathways, Poincaré explains, but recommends none as better than another: “…of all these ways, which will lead us most promptly to our goal? Who shall tell us which to choose? We need a faculty which makes us see the end from afar, and intuition is this faculty” (22). To illustrate this need, Poincaré uses chess—a metaphor which undoubtedly caught young Beckett’s attention. Poincaré asks readers to imagine a game of chess in which a player only understands the rules of the game, the closed system which governs the movement of the pieces. “[T]his is what the reader of a book on mathematics would do if he were a logician only,” he explains. “To understand the game is wholly another matter. It is to know why the player moves this piece rather than that other which he could have moved without breaking the rules of the game” (22). In other words, the pure logician would be like a player of chess who obeys the restricted movement inherent to the game without any understanding of the purpose of his movements.

Beckett takes this metaphor and inserts it directly into *Murphy*, in the famous chess game between Murphy and Mr. Endon. He describes both players’ strategies as “Fabian,” since neither seems interested in taking his opponent’s pieces. Mr. Endon in particular plays the game
imagined by Poincaré, with no apparent knowledge of the purpose of chess, simply an understanding of the moves dictated by the rules of play. He operates within the system, follows its logic, yet plays with complete disregard for strategy. He plays, according to Hugh Kenner, by “deploying his pieces and then returning them to their original state, in majestic indifference to capture, to threat of being captured, indeed to any maneuver of White’s at all” (68). To get out a board and re-enact the exhausting match, as Beckett himself carefully did (Knowlson 199), reveals the absurdity of logic without intuition. Mr. Endon moves his pieces following a logical pattern, creating a symmetrical cycle of moves that ends almost as it begins, with nearly all the pieces in their starting positions. Or rather, the game ends right before he can finish his cycle, as Murphy surrenders and slumps onto the board before that final move is played. At one point, Mr. Endon even checks Murphy’s king, and here Beckett uses his annotations to show Endon’s complete disregard for the game’s strategy:

(o) Mr. Endon not crying “Check!,” nor otherwise giving the slightest indication that he was alive to having attacked the King of his opponent, or rather vis-a-vis, Murphy was absolved, in accordance with Law 18, from attending to it. But this would have been to admit that the salute was adventitious. (147)

Endon’s gameplay thus mimics Poincaré’s metaphor, as he acts always within the bounds of the system without the intuitive faculty to move towards any tactical end. In the face of near infinite options, he chooses the symmetrical, ignorant of the strategic. In fact, even the symmetrical is simply a series of motions for Endon, and he feels no remorse when Murphy prevents him from completing the final move of his sequence: “It was of no consequence to Mr. Endon that his hand had been stayed from restoring his Shah to his square,” the narrator explains (149). Endon then moves from the chess board to the corridors of the ward, where he begins switching lights and
indicators on and off, “in a way that was… in fact determined by an amental pattern as precise as any of those that governed his chess” (148). His methods, then, are analogous to logic in Poincaré: strict, precise, yet wholly outside the intuitive realm. The why abandons the how, like Poincaré’s vision of a purely logical science in which inevitably “we can see how the questions can be answered, we no longer see how and why they are put” (21).

Furthermore, Beckett uses the performances of Murphy and Endon in the chess game to personify the laws of thermodynamics which he had studied in both The Value of Science and The Universe Around Us. Ackerley notes the entropy at work in the game, as the pieces clearly move toward disorder (Grove Companion 95). But Beckett’s representation is more precise; Endon and Murphy actually lay out the mechanics of thermodynamics quite accurately through their gameplay. The first law of thermodynamics, or the principle of the conservation of energy, states that energy cannot be destroyed, though it may change form. In the world of Murphy’s chess game, we see this principle intact. No energy is lost or removed, each piece remains in play, and even at the game’s close all the pieces retain their potential mobility.

In The Universe Around Us, Jeans writes that though the first law leads us to believe that the indestructible nature of energy might allow life to persist forever, the second law tells us that this is not so. As he explains it, energy usually moves “downhill,” and it is essentially impossible for it to move back “uphill” afterwards. Poincaré’s examples are more specific:

…heat can pass from the warm body to the cold body; it is impossible afterwards to make it take the inverse route and to reestablish differences of temperature which have been effaced. Motion can be wholly dissipated and transformed into heat by friction; the contrary transformation can never be made except partially.

(96)
In other words, though energy transformation in a closed system might appear to be reversible, in practice this energy tends toward stasis. “This is why,” writes Poincaré, “…temperatures tend to a level, without the possibility of going backwards” (97). Mr. Endon’s pieces act accordingly; he returns almost all of them to their “original state,” to borrow Kenner’s fittingly Newtonian language, but cannot (due to the rules which govern the movement of pawns) completely restore the set. The pawns maintain their potential energy, but can never be transformed back into their original position.

When Murphy runs headlong into this entropic system, he surrenders and collapses, his pieces in disarray. He finds no peace in the rigor of the Newtonian system, in what Kenner calls “the world of linkages and causes” (68). Newton’s laws claimed an order that the universe obeyed, but Murphy seeks the absolute freedom of his mind, with “neither elements nor states, nothing but forms becoming and crumbling into the fragments of a new becoming” (70). Defeated, he runs for his room, passing through a world governed by Newtonian principle: “An hour previously the moon had been obliged to set, and the sun could not rise for an hour to come” (150). His destination is, of course, his rocking chair, where he can fasten himself naked to its frame and rock, escaping into the darkness of his mind.

In Murphy’s “rock” (the planetary pun surely intended), Beckett invokes a non-Newtonian movement, using the first law of thermodynamics to signal the monolithic “truth” of Newtonian law: “Most things under the moon got slower and slower and then stopped, a rock got faster and faster and then stopped. Soon his body would be quiet, soon he would be free” (8). Murphy employs a system outside the cannon of scientific law; his rock somehow circumvents the Newtonian paradigm. In his final rock, he glimpses a void where once Newton’s muses

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3 In *The Lost Ones* (1972), Beckett will return to this idea, creating a closed system that rejects the principle. The light and temperature in this system oscillate back and forth like a pendulum, never levelling out.
shined: “he saw… the skylight, open to no stars” (151); then he fades, his body still, under the “excellent gas, superfine chaos” (151). Murphy seeks escape from the body, but also from the system that regulates bodies, at rest and in motion. Poincaré used atomic motion and its disregard for Newton’s laws to oppose the idea that scientific laws could ever express absolute truth, and Beckett shows that the little world of Murphy’s mind likewise rejects the rigid Newtonian system: “But how much more pleasant was the sensation of being a missile without provenance or target, caught up in a tumult of non-Newtonian motion” (70).

Murphy ends in the park with Mr. Kelly flying his kite—a scene Beckett apparently foresaw when he was only nine thousand words into the book, writing his intentions in a letter to Thomas McGreevy after watching men flying kites at Kensington Gardens (Fehsenfeld 274). Knowlson calls this moment in the novel a “powerful image of freedom and release,” one of the Murphy’s “fundamental themes” (197). For many critics, Ackerley among them, Mr. Kelly’s kite acts as “an emblem of the separation of body and mind” (Grove Companion 338). Without contesting either reading, I will offer another angle, so to speak: the non-Euclidean. For although a Cartesian split undoubtedly influences much of the novel’s imagery, Kelly’s kite speaks as much to Poincaré as Descartes, and in this poignant scene Beckett expresses a major theme of Poincaré’s: the legitimacy of non-Euclidean geometry as a symbol of multiple valid interpretations of the physical world.

Poincaré asserts that the “immutable” laws of science are chosen simply for their convenience. They are not undeniably true; rather, they are useful because they work as tools which we can use to better express the world around us. To illustrate this point, Poincaré asserts that non-Euclidean geometries are no less true than Euclidean, a fundamentally disturbing argument for the scientific community near the turn of the century. As Gray recounts, “Euclid’s
Elements had survived into the modern era… [becoming] a paradigm of logical reasoning and
the great, perhaps the only exemplar, of certain knowledge” (35). Poincaré proved through a
surge of papers on the subject that non-Euclidean geometry was as valid as Euclidean, and that it
could also treat a wide range of problems in mathematics. He suggests that Euclidean geometry
holds such a high place in scientific thought simply because of its convenience, not its
fundamental reality. Indeed, the true difference between a Euclidean straight and a non-
Euclidean straight is simply the fact that Euclidean lines conform to “the eternal idea of a straight
which I have by intuition” (37). Such an idea exists nowhere in the physical world; it is a product
of mathematical conjecture. The non-Euclidean straight, he explains, can just as easily created
through intuitive powers.

This idea marked a turning point in Poincaré’s work, according to Gray, and Poincaré’s
ideas on the nature of geometry “broadened into an account of the nature of mathematical
knowledge, how it relates to logic and to arithmetic, as well as its connections to geometry and
the study of space” (46). The destabilizing work of non-Euclidean geometry began a new line of
thinking for Poincaré, which ultimately influenced the epistemological argument of *The Value of
Science*. Gray explains,

Geometrical conventionalism was his explanation of how knowledge is possible
at all. It is a theory of how the individual constructs his or her notion of space and,
like cognitive science today, it is a mixture of evolutionary ideas and ideas about
early mental development. But it, too, leaves open the idea that other intelligent
beings might make a different construction of space, and find it to be, say, non-
Euclidean rather than Euclidean. There would be no fact of the matter, only a
choice based on convenience. (Gray 8)
Matthew Feldman traces Beckett’s interest in the idea of alternative geometries back to his first published essay, “Dante… Bruno. Vico.. Joyce,” in which he writes, “There is no difference, says Bruno, between the smallest possible chord and the smallest possible arc, no difference between the infinite circle and the straight line” (quoted from Feldman 17), and indeed something of the non-Euclidean resonates here. In non-Euclidean geometry, the straight line may actually correspond to a Euclidean curve, the angles of a right triangle may add up to less than 180 degrees as a right triangle transcribed on a sphere might.

Though probably unaware that Beckett had read Poincaré’s geometric claims, Kenner suggests that “The Beckett novel or play or film, in fact, is strikingly similar to a non-Euclidean geometry” (62). He gathers this from Beckett’s tendency to create works that follow rules that do not make sense in our own world, which he notices in Murphy’s scarves: “The games in a novel are played in a different universe, where for instance a man can place his hands behind him and then tie his wrists securely to a strut on the back of his chair” (59). It is a remarkably perceptive claim, especially considering that Beckett read Poincaré’s argument about non-Euclidean geometry representing a perfectly valid alternative to Euclidean.

Such geometry acts as the principle metaphor of Mr. Kelly’s scene:

Except for the sagging soar of the line, undoubtedly superb so far as it went, there was nothing to be seen, for the kite had disappeared from view. Mr. Kelly was enraptured. Now he could measure the distance from the unseen to the seen, now he was in a position to determine the point at which seen and unseen met. (167, italics mine)

A kite, in Euclidean geometry, is a quadrilateral with two distinct pairs of adjacent and equal sides. Beckett places this geometric shape beside the Round Pond, and adds to it the geometric
language line and point. This is not a Euclidean plane, however, for Kelly treats the “sagging” line as a straight, using it as a measurement for the distance between two points. In non-Euclidean geometry, the curved line might very well act as the shortest distance between points, and what Poincaré importantly shows is that neither of these competing systems is correct or true, they simply represent two constructed strategies for explaining the physical world.

Murphy’s freedom also moves beyond Euclidean certainty, and the discussion of his mind reveals it to be a zone that aligns with Poincaré’s belief that neither geometry is truer than the other. The fifth postulate of Euclidean geometry, the parallel postulate, has given mathematicians trouble almost since its formulation, since parallels can never be observed fully—there is no way to verify that they will not converge at some point. Non-Euclidean geometry can negate the existence of parallels, or incorporate parallels that reject Euclid’s postulate. Murphy’s mind consists of both: “It contained forms with parallel… and forms without, but not right forms and wrong forms” (68). Like Poincaré, Murphy draws no distinction between right and wrong geometries, and his mind includes both Euclidean and non-Euclidean.

In the third zone, Murphy himself enters into this geometry: “he was a point in the ceaseless unconditioned generation and passing away of a line” (70). His is a geometry without condition, “nothing but commotion and the pure forms of commotion” (70).

In Mr. Kelly’s case, Beckett invokes a historical moment of scientific triumph in which Newton’s principles allowed the discovery of Neptune—a planet that like Kelly’s kite remained out of sight:

[Kelly’s] would be an unscientific observation, so many and so fitful were the imponderables involved. But the pleasure accruing to Mr. Kelly would be in no way inferior to that conferred (presumably) on Mr. Adams by his beautiful
deduction of Neptune from Uranus. He fixed with his eagle eyes a point in the
empty sky where he fancied the kite to swim into view, and wound carefully in.

(167)

Beckett showed his admiration for Adams’s discovery in his *Dream* notebook, writing, “Neptune
calculated (not observed) from observed vagaries of orbit of Uranus (Greatest triumph of human
thought)!!” (Ackerley, *Demented Particulars* 14). He apparently read about this discovery in the
early 30s, from James Jeans’s *The Universe Around Us*, which calls the discovery “the greatest
triumph of the human mind” (16). In invoking Adams, Beckett presents a dichotomy—Kelly’s
experiment, called “unscientific,” and Adams’s, called “beautiful”—that implicitly questions the
privilege of scientific law as fundamental truth. Furthermore, by pitting Adams’s Newtonian
experiment against Kelly’s non-Euclidean one, Beckett offers another way of measuring the
world beyond the rigid machinery of Newtonian law. Like Poincaré he suggests an
epistemological stance open to other ways of knowing, other systems for accessing the “unseen.”
One cannot apply Newtonian principles to access that which is beyond the physical, just as one
cannot express that realm adequately through language.
"In sum, the sole objective reality consists in the relations of things whence results the universal harmony. Doubtless these relations, this harmony, could not be conceived outside the mind which conceives them. But they are nevertheless objective because they are, will become, or will remain, common to all thinking beings."
- Poincaré, The Value of Science

"Cracks soon appeared in this formulation."
- Beckett, Watt

Of all Beckett’s novels, *Watt* might be said to be the most mathematical, decorated as it is with axioms, sequences, formulae, and sets. Ackerley calls it “ostentatiously arithmetical” (*Debts and Legacies* 93), but like *Murphy*, it also features a great deal of scientific matter. If Beckett’s fascination with both planetary and atomic motion finds its way into the structure of *The Unnamable*, he began this practice in *Watt*, a work almost entirely structured around orbitals. Watt orbits around Mr. Knott’s house, seeking entry; he studies intently a painting of a point and a circle, the point orbiting, it seems, attracted to the center; Watt and his fellow servants work on various levels of Knott’s estate, like the orbitals of electrons, and even jump from one level to the next, reflecting contemporary atomic theories (Montgomery 177). Given that Poincaré’s discussion of atomic and planetary motion actually works to show the dissolution of classical physics, such movements fit nicely in the disorienting world of *Watt*, which leans on scientific and mathematical language even as it crumbles.

Beckett creates in Mr. Knott’s house a miniature version of the Newtonian universe, following the principle of the conservation of mass which he had read about in Poincaré:
Watt had more and more the impression, as time passed, that nothing could be added to Mr. Knott’s establishment, and from it nothing could be taken away, but that as it was now, so it had been in the beginning, and so it would remain to the end, in all essential respects, any significance presence, at any time… (274)

Although Beckett wrote these words long after he read *The Value of Science*, Poincaré was still on his mind as he penned *Watt*. As Matthew Feldman points out, Beckett often relied in his writing on sources acquired much earlier in life, and his recall for such texts was impressive. As an example Feldman cites a letter Beckett wrote to Alan Schneider, in which he recalls, without notes, a large amount of information regarding pre-Socratic arguments (32). As I will show, Beckett likewise recalls his reading of Poincaré, and the scientific imagery in *Watt* echoes the philosophy of *The Value of Science*, though ultimately rejects the optimism of its conventionalism.

Much has been said about Watt’s name, the obvious pun on *what*. The question haunts him throughout the novel, and he lives up to the curiosity it implies:

Watt’s attention was extreme, in the beginning, to all that went on about him. Not a sound was made, within earshot, that he did not capture and, when necessary, interrogate, and he opened his eyes wide to all that passed, near and at a distance, to all that came and went and paused and stirred, and to all that brightened and darkened and grew and dwindled, and he grasped, in many cases, the nature of the object affected, and even the immediate cause of its being so. To the thousand smells also, which time leaves behind, Watt paid the closest attention. (236)

Like a scientist, Watt carefully observes the world through his senses, and also creates hypotheses through systematic logic, charts, and tables. In the absence of sensory data he reverts
to experimentation, as when he must determine what kind of key fits Erskine’s lock: “Then how did Watt know Erskine’s key was not a simple key? Why, for having turned and twisted his little wire in the hole” (269). He has meteorological interests (“…Watt had a great experience of clouds, could distinguish the various sorts, the cirrus, the stratus, the cumulus and the various other sorts, at a glance” (234)), as well as astronomical ones (“he rose and went to the window, to look at the stars, which he had once known familiarly by name” (342)). The narrator—called Sam, eventually—shares Watt’s scientific impulse, and the thought of deducing Mr. Knott’s physical measurements delights him: “…they stood together, the master and the servant, the bowed heads almost touching (which gives Mr. Knott’s approximate height, does it not, assuming that the ground was level)” (287). Watt’s name therefore exemplifies the goal of both narrator and protagonist, to express some answer to the fundamental scientific question.

The name should also call to mind another Watt—James Watt, the great Scottish inventor. By the time Beckett translated his novel into French, he decided to make this allusion more apparent, so that Arsène asks, “Plait-il? Comme la machine a vapeur?” (Ackerley, *Obscure Locks* 73). In a novel that begins and ends with trains, the direct allusion to the steam engine pioneer should draw the attention of “the gentle skimmer.” This Watt invented an imperfect but powerful system that could use its own waste as an energy source, thereby fighting the second law of thermodynamics. For this reason he has been called “the forerunner of Maxwell’s demon,” a reference to J.C. Maxwell’s claim that an imaginary entity with the vision and dexterity capable of seeing and arranging hot and cold molecules would be able to reverse thermodynamics (Huber 187). Beckett noted Maxwell’s demon in his Whoroscope Notebook, and could have read about the mechanical process James Watt created, which was explained in detail in his 1911 *Encyclopedia Britannica.*
In any case, Beckett admired Maxwell, and saw Poincaré as a figure who reveled in the untruths of science, the crises that demons like Maxwell’s create. Instead of treating scientific laws as immutable, Poincaré embraced their failures as sites of true progress. In the 1938 essay “Les Deux Besoins,” Beckett praises Poincaré’s rejection of rigid scientific law, writing,

If it is permitted in a similar way to speak of an effective principle, it is not, thanks be to God and Poincaré, that which governs the petitions to principle in science and the crossed logos of theology which feed the storms of affirmative and negative farts that have produced and continue to produce those crappy a posterioris of Spirit and Matter which are the despair of savage peoples. These go forward with blasts of ‘yes’ and ‘no’ like a detonating shell, until truth blows up. Another. Irreversible. Dead and wounded bear witness to the fact. (Feldman 18, his translation)

Beckett deeply respected Poincaré’s belief that scientific principles should never act as a basis for fundamental Truth. In *Watt*, he suggests a different conception of epistemology, one that aligns with Poincaré’s.

Like *The Value of Science*, Beckett’s novel destabilizes concrete notions of space and time. *Watt* presents numerous problems of both dimensions that disorient readers and force them to acknowledge space and time as unruly things themselves. For example, Watt has a strange tendency to enter spaces that seem sealed, like Knott’s locked house (197), and Erskine’s locked room (272). Watt sees objects that defy the apparent rules of space, as when “the man standing sideways in the kitchen doorway looking at him became two men standing sideways in two kitchen doorways” (219), or when Watt sees himself, it seems, approaching in the dusk. The motion of his doppelganger operates somehow apart from Newtonian motion, for just as it draws
near, suddenly “the figure, without any interruption of its motions, grew fainter and fainter, and finally disappeared” (355).

Strange chronologies also appear in the narrative, which itself is built on chronological disorder (“Two, one, four, three, that was the order in which Watt told his story” (245)). Arsene tells of a man named Mr. Ash, who Arsene knew and once ran into on the Westminster Bridge. Mr. Ash offers the time (though he is not asked for it):

[He] sprang open its case, held it to his eyes (night was falling), recovered in a series of converse operations his original form, said, Seventeen minutes past five exactly, as God is my witness… A moment later Big Ben (is that the name?) struck six. (204-205)

Ackerley points out the “useless symmetry” in the time Mr. Ash gives (seventeen after five is 17:17) (Obscure Locks 69), and this symmetry is one of many. The time according to Big Ben is 6:00, which would appear symmetrical on the clock’s face, with the hour and minute hand bisecting its center. Furthermore, Arsene then makes an oblique Biblical reference—“if you want a stone, ask a turnover”—which echoes the eleventh verse of the eleventh chapter of Luke: 11:11. Such symmetries tempt readers to see an order in the world that the chronological disparity undercuts. Eleanor Swanson argues that, “Time, as Beckett illustrates it in the novel, is a hypostatization—another presumption man has made about the universe to categorize and govern its operation” (264). This is certainly true of Watt, and it connects directly to Poincaré’s rejection of Newton’s absolute time.

Beckett had read Poincaré’s claim about the relativity of time: “Of two watches, we have no right to say that the one goes true, the other wrong; we can only say that it is advantageous to conform to the indications of the first” (30). Simultaneity and succession may seem intuitive, but
he rejects this assumption outright. We have not even the ability to say that an hour today will be equal to an hour tomorrow. Instead,

We choose these rules, not because they are true, but because they are the most convenient, and we may recapitulate them as follows: “The simultaneity of two events, or the order of their succession, the equality of two durations, are to be so defined that the enunciation of natural laws may be as simple as possible. In other words, all these rules, all these definitions are only the fruit of an unconscious opportunism.” (Poincaré 36)

In The Value of Science, problems of timekeeping accumulate to show the impossibility of absolute truth in scientific process. This leads Poincaré to suggest that facts must be chosen, not simply proven. Like Poincaré, Arsene sees the time discrepancy as a symbol for knowledge generally, explaining, “This in my opinion is the type of all information whatsoever, be it voluntary or solicited” (205). Mr. Ash’s time and Big Ben’s time cannot be reconciled, for neither can claim “correctness.” Big Ben conveys the time of convention, agreed upon for simplicity, not inherent accuracy.

That Mr. Ash’s time discrepancy is a reference to the argument of The Value of Science becomes all the more plausible in light of the fact that Beckett directly cites Poincaré in his Watt notebook. Ackerley’s thorough annotation of the novel points out that “Beckett wrote in large letters on the verso of an early draft (NB3, 78): ‘POINCARÉ’” (Obscure Locks 105). The inscription appears opposite the description of Mr. Knott’s meals, mixed as they are of multitudinous ingredients, which Ackerley believes references “the French mathematician’s insistence on the irreversibility of time’s arrow, the ingredients ‘never again to be divided’” (105). The appearance of such a note shows that Poincaré was still very much on Beckett’s mind.
as he wrote his novel, though in this rare case Ackerley misses the particular significance of the allusion.

We are told that the ingredients of Mr. Knott’s meal “had never varied, since its establishment, long long before, and that the choice, the dosage, and the quantities of the elements employed had been calculated, with the most minute exactness” (238). Watt is expected “to weigh, to measure and to count, with the utmost exactness, the ingredients that composed this dish,” a job he confronts with the absolute rigor of a scientist. But, as Poincaré shows, there exists no true precision in the physical world, and Watt acts as a living symbol of such inexactitudes:

And in warm weather it sometimes happened, as [Watt] mixed, stripped to the waist, and plying with both hands the great iron rod, that tears would fall, tears of mental fatigue, from his face, into the pot, and from his chest, and out from under his arms, beads of moisture, provoked by his exertions, into the pot also. (238)

This moment refigures Poincaré’s first crisis of science in which the laws that seemed immutable were exposed as inexactitudes themselves. Like much of Mr. Knott’s universe, this practice has continued since “long, long before,” yet the text questions its fundamental validity.

The passage also shows Beckett returning once again to Poincaré’s explanation of the second law of thermodynamics. Beckett’s description harmonizes with *The Value of Science*, as Poincaré also uses the mixing of liquids to help readers visualize the principle:

A drop of wine falls into a glass of water; whatever may be the law of the internal motion of the liquid, we shall soon see it colored of a uniform rosy tint, and however much from this moment one may shake it afterwards, the wine and the water do not seem capable of again separating. (97)
This is perhaps what Ackerley means in his note: that like Mr. Endon’s chess pieces the mixture can never be made right again. But Poincaré’s discussion goes much deeper, complicating the idea that mixture actually creates something new, as Knott’s “poss” seems to. Poincaré explains,

If the world tends toward uniformity, this is not because its ultimate parts, at first unlike, tend to become less and less different; it is because, shifting at random, they end by blending. For an eye which could distinguish all the elements, the variety would remain always as great; each grain of this dust preserves its originality and does not model itself on its neighbors; but as the blend becomes more and more intimate, our gross senses perceive only the uniformity. (96-97)

In other words, only the roughness of our senses prevents our seeing the true elements of the mixture, and if Watt believes Knott’s meals to be “transformed into a single new good thing” (237), this is due simply to the weakness of his senses. For Poincaré, our failure to distinguish the world at such a minute level does not discount the possibility of an ordered, rational universe, but it limits our ability to ever truly know the universe with real certainty. If our eyes see the thing changed, not the separate parts, one wonders about Mr. Knott and his meal: can he distinguish the various ingredients? We are led to believe that he can, since apparently “even the tiniest spoonful at once opened the appetite and closed it, excited and stilled the thirst, compromised and stimulated the body’s functions, and went pleasantly to the head” (237). We saw that Poincaré used perception and perspective to undercut absolute truth, and here that idea gains momentum. Beckett’s invocation of Poincaré’s metaphor of mixture signals perhaps the greatest imprint of Poincaré’s thought on Watt: an epistemological conventionalism.

Numerous scientists of the early 20th century began to question the relationship between space and time, Poincaré among them. Aware of these scientific questions, Beckett includes
reference to more complex theories of quantum mechanics throughout *Watt*, comically oversimplified as “the simple games time plays with space” (227). Mr. Hackett also comments on “the frigid machinery of the time-space relation” (184), and Watt later applies such language to art, remarking that the painting in Erskine’s room exists in “boundless space, in endless time” (273). Ackerley argues that

[Watt] clutches to the perimeter of a classical Newtonian universe where laws of reason, harmony, and equilibrium hold sway, unaware of the developments in contemporary physics (atomic fission, quantum mechanics, relativity, and uncertainty) that have changed the rules. (*Obscure Locks* 94)

Though this agrees with the narrator’s assertion that “Watt knew nothing of Physics” (273), another possibility exists, one that better fits the epistemology of *Watt*.

In *Watt*, as in Poincaré, scientific truth is never absolute. Instead, understanding of the world comes through making choices from a range of possibilities, none necessarily truer than the next, but rather chosen by preference or convenience. The novel opens with what Mark Byron calls “a slow waltz of minimal orientation and diminished ownership” (495), in which we see the first hint of chosen knowledge in *Watt*:

MR. HACKETT turned the corner and saw, in the failing light, at some little distance, his seat. It seemed to be occupied. This seat, the property very likely of the municipality, or of the public, was of course not his, but he thought of it as his. This was Mr. Hackett’s attitude toward things that pleased him. He knew they were not his, but he thought of them as his. (171)
Byron notes that “Hackett’s knowledge stems more from pleasure than thought, and actually in spite of thought” (496). Like Mr. Ash, he chooses his facts based on what most pleases him, though competing theories undoubtedly exist.

In the same way, Watt knowingly chooses theories that please him when faced with uncertainty. For example, Watt hears a “mixed choir” singing a song with two verses, each the result of an implicit math problem. The first, “fifty-two point two eight five seven one four / two eight five seven one four…” corresponds to the days in a leap year (366) divided by seven, while the second, “Fifty-two point one / four two eight five seven one…” corresponds to the days in a regular year (365) divided by seven (Obscure Locks 55-56). Both are, in fact, correct mathematical answers to the same question: how many weeks in a year? Importantly, neither answer is truer than the other; both accurately answer the problem. Watt chooses, therefore, based on his pleasure: “of these two verses Watt thought he preferred the former” (196).

Likewise, Watt cannot tell how Mr. Knott’s door came to be unlocked, a phenomenon he notably sees as scientific: “the science of the locked door, so seldom at fault, had been so on this occasion” (197). Once again, the narrator explains, “Of these two explanations Watt thought he preferred the latter, as being the more beautiful” (197). When science fails, as it is bound to, Watt leans instead on the answer that pleases him most. Poincaré encouraged this. “Method,” he wrote, “is precisely the choice of facts” (6), and Watt’s method aligns with Poincaré, who argued that “the longing for the beautiful” was often the determining factor in scientific fact choosing (8).

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4 The drafts of Watt show that Mr. Hackett and Watt were originally the same character, which may explain this similarity (Byron 496).
The most beautiful facts sometimes turn out to be the simplest, according to Poincaré:

“And it is because simplicity, because grandeur, is beautiful, that we preferably seek simple facts, sublime facts” (8). Watt shows this as he considers the way the Gall’s choose their facts:

[Watt] knew that he was in the presence of father and son… Or were they not perhaps merely stepfather and stepson. We are the Galls, stepfather and stepson—those were perhaps the words that should have been spoken. But it was natural to prefer the others. (224)

Poincaré insists on a conventional science, one constructed from convenient solutions, not absolutes. This conventionalism surfaces as Watt tries to understand the problem of Mr. Knott’s dogs. The narrator charts a speculative history of all the “solutions that had not apparently prevailed, along with “some of those objections that were perhaps the cause of their not having done so” (246). His scientific model follows Poincaré’s conventionalism; the principles which science often holds dear are merely the aggregate of the most convenient solutions, or the solutions with the fewest objections.

The implicit end of such conventionalism is the loss of absolutes, and indeed the loss of access to true reality. Poincaré adamantly believes that true reality cannot be accessed by the human mind:

Does science teach us the true nature of things? …no one would hesitate to reply, no; but I think we may go farther; not only science can not teach us the nature of things; but nothing is capable of teaching it and if any god knew it, he could not find the words to express it. (138)

To believe otherwise, to believe in the ability to perceive fundamental truth, is in Watt a mistake to be corrected. This is what Beckett means when he refers to “the old error” throughout the
novel; it is the error of belief in the absolute. And try as he might, Watt cannot help but fall into it, from time to time:

For Watt’s concern, deep as it appeared, was not after all with what the figure was, in reality, but with what the figure appeared to be, in reality. For since when were Watt’s concerns with what things were, in reality? But he was for ever falling into this old error, this error of the old days when, lacerated with curiosity, in the midst of substance shadowy he stumbled. (227)

If Watt’s name represents the question “eternally posed” (Swanson 264), it remains eternally unanswered, doomed from the beginning. As Poincaré explains, “When a scientific theory pretends to teach us what heat is, or what is electricity, or life, it is condemned beforehand” (138).

It is in response to this limitation that Watt drifts away from Poincaré. As I wrote in Chapter 1, Poincaré ends his work by arguing that objectivity, which may be the closest we can come to absolute truth, emerges through the common language of science. He maintains a sincere belief that “Science speaks only of relations between sensations, and once the role of convention is understood it is objective precisely because it is a system of relations” (Gray 72). His conventionalism therefore stems from the belief that people can and will communicate about the universe and build upon their shared sensations a better understanding of the world. Two people may not be able to say with certainty that they see the same red, but through discourse they may use common relations (like agreeing that a rose and a cherry have the same color) as a basis for a shared language about the perceived world. “Poincaré set a great store by the ability to converse effectively” Gray explains, and “For [him] science was effective because it rested on communication between people” (71-72).
Beckett is not as quick to assume that communication could ever be so trustworthy. In Watt, even eye contact proves so difficult to achieve that intricate strategies must be created for a five-man committee to “look at itself,” much less agree on anything (314). Language is fraught with uncertainty, if not downright deceit. Sam, the narrator, claims that his own knowledge is based entirely on communication with Watt:

> And so always, when the impossibility of my knowing… what I know… seems absolute, and insurmountable, and undeniable, and uncoercible, it could be shown that I know, because Watt told me… For I know nothing, in this connexion, but what Watt told me. (271)

Yet Watt’s testimony hardly offers certainty. We find that he recounts much of his tale out of order, and eventually even jumbles the letters, words, and sentences haphazardly in his telling. Sam cannot be sure of what he misses through this broken communication, and utters his qualifying refrain: “Thus I missed I suppose much I presume of great interest I suspect [of Watt’s story]” (306). Every time he makes progress in learning to decipher Watt’s speech, a new problem arises. “But soon I grew used to these sounds, and then I understood as well as ever, that is to say fully one half of what won its way pasts my tympan. For my own hearing now began to fail, though my myopia remained stationary” (306). Sam admits taking great liberties with information in the novel, and the disparity between a fact and its transmission seems a matter to be accepted without question. “The figures given here are incorrect,” he calmly notes; “The consequent calculations are therefore doubly erroneous” (251).

Poincaré’s conventionalism ultimately fails in the universe of Watt, and his vision that science might create a language of mutual agreement and progress dissolves as the reliability of communication itself dissolves. Beckett’s turn away from the possibility of human connection in
Watt seems to fit his experience during the time of its composition. He wrote the novel in part on the run from the Gestapo, surely a time of isolation and dislocation, but also a time in which communication was rendered near impossible. His work in the resistance cell had been translation, and the difficulty of passing information among resistance groups certainly resonates in the problems of translation and communication that occur in Watt, as well as the coded nature of the language.

A particular moment of failed communication stands out in Knowlson’s biography, and surely Beckett never forgot it. Upon receiving word that a fellow resistance member had been captured, Beckett and Suzanne rushed to escape. First, however, Beckett quickly tried to warn other members of the cell. Knowlson recounts,

He telephoned to a chef who he knew worked with [the resistance cell] but was unable to reach him; the young man was soon arrested and tortured. He also risked calling on his chief contact, the Greek photographer, who did not take Beckett’s warning seriously enough and delayed his escape. He, too, was soon picked up by the Gestapo. (268)

Missed contact, misinterpreted communication—here these problems gain grim resonance.

As Kenner notes, Watt is not a self-portrait, nor an occupation story. Nonetheless, it deals with the “business of survival amongst uncertainties, ambiguities” (73), among them the uncertainty that language could ever offer a clear path, as Poincaré believes it can, toward objectivity.
CONCLUSION

THE VALUE OF POINCARÉ IN BECKETT STUDIES

As I have shown, Beckett not only alludes to Poincaré in both *Murphy* and *Watt*, but he also converses with some of the more prominent ideas put forth in *The Value of Science*. Beckett saw Poincaré as an example of thinking outside the binaries *true* and *false*, and as a writer who introduced new ways of discussing science, and knowledge more generally. Particularly in his assertion of the validity of non-Euclidean geometry, Poincaré challenged the scientific community to consider other modes of knowing, and to question theories so often labelled as fact—a project Beckett surely admired.

By entering Poincaré into the conversation about Beckett’s early fiction, I hope this study can similarly open up new ways of seeing Beckett. If Murphy’s chair has long been thought a Cartesian metaphor, I hope it can also now be considered as a challenge to the rigidity of Newtonian law, in harmony with Poincaré’s rejection of rigid scientific dichotomies. If *Watt*’s central theme is “the need to know and the difficulty and … impossibility of knowing,” as Lawrence Harvey claims (75), perhaps this can be better understood in light of Poincaré, whose strategy for knowing *Watt* examines and ultimately rejects.

Finally, studies of Beckett’s engagement with science tend to discuss Beckett and Science as if either entity could be encapsulated into a single essay. Though there is a time to look at the way Beckett generally employed science and other systemized languages for some artistic purpose, there is also a time to investigate more particularly the conversation he might be having with specific scientific works. By looking specifically at Poincaré, and singling out only
one of his texts, I hope this thesis also suggests a narrower mode of scholarship that can offer a different way of seeing Beckett’s engagement with scientific conversations.
REFERENCES


How much of science do you believe proceeds by the Scientific Method and how much by intuition, guessing, trial and error? • Zero • About a quarter • About half • About three quarters • Roughly All. 22. Failure is not only valuable retrospectively, because it resulted in some eventual success or lead to an unexpected discovery (serendipity). These are all fine, but they are not a requirement for a failure to be valuable. Failure is integral to the process of science. It cannot be left out or avoided. It can be utilized and improved.

41. We gain knowledge of ignorance through failures. Enrico Fermi 1901-1954. This failure is spectacular. For most cases where science is wrong, it is just because we donâ€™t have better data, we donâ€™t have better imagination, or we donâ€™t have better mathematics. They are all understandable errors, and they are just necessary paths to the correct models. It is wrong to think that time and space are absolute, but unless we have sufficiently good apparatus, mathematics and imagination, it is something that science must go through. This is not true for this dietary fat and cholesterol nonsense. The science process simply failed. The sugar industry, to protect their monetary interests, buy enough fabricated research to point people to fat and cholesterol. I only know of clear evidences.