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FROM JEU D'ESPRIT TO EXACT SCIENCE: SPECULATION, SCIENCE, AND
LITERARY EXPRESSION IN THE US, 1870-1895

by

Charles Robinson

A Dissertation

Submitted in Partial Fulfillment of the

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Major: English

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This work is dedicated to all the intellectuals in my family, especially Ara Nelle Robinson, who started reading science fiction to me when I was seven years old, and Leigh Bramhall Robinson, who did his best to explain to me how my favorite superheroes' powers might work, were they scientifically possible.

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Abstract

Robinson, Charles Leigh. PhD. The University of Memphis. May, 2017. From *Jeu D'Esprit to Exact Science: Speculation, Science, and Literary Expression in the US, 1870-1895*. Donal Harris, PhD.

From Jeu D'Esprit to Exact Science: Speculation, Science, and Literary Expression in the US, 1870-1895 argues that as the nineteenth century closes, speculative prerogatives become practically forbidden as a motive for scientific inquiry, yet more common in literary writing and other imaginative extrapolations. Linking this development to two metascientific concepts, gradualism and descriptionism, which come to fruition in the second half of the century, I explore how a variety of texts, including novels, short stories, editorials, and scientific reports of the 1870s, 80s, and 90s, advance and confront these concepts. The introduction establishes 1870-1895 as a period of diverse definitions, prerogatives, and print mediations of science. Each subsequent chapter examines an element of this cacophony. Chapter two, "Speculation, Extraction, and Polytechnical Education in The Gilded Age," reads Twain and Warner's *The Gilded Age* as a critique arising from the gold and silver rushes of the 1850s and 60s in which the authors recommend organized, professional, systemic science over haphazard prospecting activity. Chapter three, "Demarcation Problems: Speculation, Extrapolation, and Pseudo/science in the Works of Ignatius Donnelly," argues Donnelly's pseudoscientific writing on broadly geological topics urges his readers to reimagine humanity's place in the universe. Moving from her earliest writing to her superlative treatment of the individual as document in *A Country Doctor*, chapter four, "The Value of an Individual: Sarah Orne Jewett as Statistician," suggests that Jewett's regionalist fiction responds to statistically-driven social science by doing another kind of statistical description, rather than rejecting statistics outright. Finally, in chapter five, "'Speculation Has Exhausted Itself': Iola Leroy, Social Con/science, and Racial Uplift," I

contrast the sentimentalism of Francis Ellen Watkins Harper's historical romance, *Iola Leroy*, to ethnologies by Alexander Crummell, William Wells Brown, and George Washington Williams. I argue that Harper's narrative envisions a Christian humanism that champions affective certitude over propositional scientific truth, making individual experience the arbiter of sociological description rather than the other way around.

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1. Introduction: Speculation, Science, Literature, Imagination

Changing attitudes toward science signify more than just changes in the sciences themselves. A given *belief-in-science* assumes a particular sense of “science” and imbues the rest of the world with meaning on that basis, delimiting what the believer looks for, holds to be relevant, and knows to be possible. It is the work of this dissertation to substantiate these statements by examining a range of texts concerned with the meanings and applications of things called “science” in late nineteenth century American culture. In the 1870s, for example, various writers frame research on the lost continent of Atlantis as either non-science or cutting-edge, exact science, suggesting a definitional muddle.¹ George S. Jones suggests, in an 1874 number of *Appleton’s Monthly*, that readers should dismiss speculation on Atlantis by accomplished archaeologist Brasseur de Bourbourg as an “elaborate jeu d’esprit” (820). Jones worries that this will be the only way to maintain Brasseur de Bourbourg’s contributions to the archaeology of Mesoamerica. Five years later, in *Popular Science Monthly*, Edward H. Thompson defends his own ideas on Atlantis and invokes “the spirit of rationality...that tells men to look upon a new idea or theory, even if it does run outside of the accustomed rut, with a reasoning if not favorable eye” to displace “the spirit that told men to scorn and deride Galileo and Columbus” (764). Thompson, writing at the age of twenty-two, later embarked on a lifelong study of Mayan ruins and renounced his youthful views—but here invokes “rationality” in favor of a realm of inquiry

¹ Donna Haraway, in *Staying with the Trouble*, uses the word *muddle* “as a theoretical trope and soothing wallow to trouble the trope of visual clarity as the only sense and affect for mortal thinking.” For Haraway, “muddles team with company” while “empty spaces and clear vision are bad fictions for thinking” (174n7). Her sense of urgency is biological while mine is disciplinary. Sorting out muddles of science, speculation, imagination, and art, by erecting bounded disciplines, tends to create (intrinsically) useless problems rather than useful solutions. Galison’s ten problems, which I discuss below, have proved *instrumentally* useful for my dissertation but are *intrinsically* useless problems created by the sorting out of the muddle.

that most academics, intellectuals, and scientists today have consigned to the post-fact television programming on the History Channel.

Connecting the problems of historiography, philosophy of science, and literary criticism evoked by such disagreements, I explore how all kinds of writing of the 1870s, 80s, and 90s imagines science, focusing on the role played by speculation in such acts of imagination. As with individual careers, like Thompson's (or that of Ignatius Donnelly, whose oeuvre I examine in chapter three), speculative zeal can drive a new science—as was the case with statistics and sociology. Some scientists, especially those near the nexus of education, civil service, and natural resource exploitation (like the geologists I study in chapter two) worried that a speculative turn of mind could prove hazardous to exact science—if only economically and politically. While such a conviction might have won the day, plenty of writing, like that of Bourbourg, Thompson, Donnelly—and also Jewett and Harper—recommends attending to the moment's synchronic invocations of both rigorous, exact science and the liberties of speculation. Rather than separating scientific from nonscientific writing, then, I read texts relative to the cognitive work they motivate. I argue that speculation, as it moves from scientific to literary production transforms—in the realm of public discourse, at least—from an inspiring, motivating force to an extrapolative *jeu d'esprit*: an outlying, even untrustworthy, kind of imagination. In this way, speculation, as a mode of thought, provides a unifying focus for my textual selection since author, movement, genre, and scientific discipline do not—and cannot, for reasons I lay out below.

Between 1870 and 1895, speculative prerogatives become generally less common in scientific writing and practically forbidden as a motive driving scientific inquiry, yet more common in literary writing, acceptable—if only as a diversion—in imaginative extrapolations. In

a survey of nineteenth century American literature, Gerry Canavan and Eric Carl Link note that, “one finds a variety of texts that prefigure SF [science fiction] and wear their literary influences on their sleeves” (6). In the first half of the nineteenth century these texts include works by well-known figures like Poe and Hawthorne, as well as texts that only an SF historian might know, like *Symzonia; Voyage of Discovery* (1820) by Captain Adam Seaborn (a pseudonym) and George Tucker’s *A Voyage to the Moon* (1827) (6). The latter half of the century is marked heavily by Darwin, but also by Edisonades—“tales of remarkable applied science in which inventors (often boy geniuses) use their technological facility to save the day and win acclaim”—like Edward S. Ellis’s *The Steam Man of the Prairies* (1868) (7). Proto-science fiction works come from abroad as well: Jules Verne begins to appear in English translation in the 1860s and H. G. Wells publishes *The Time Machine* in 1895. Canavan and Link’s snapshot deserves fleshing out, as various authors can be found combining scientific, narrative, and speculative impulses in a plethora of ways in the 1870s and 1880s before literary naturalism supplies an identifiable predecessor of science fiction, as Canavan and Link identify it.² I do not, however,

² In their “Introduction” to *The Cambridge Companion to American Science Fiction*, literary naturalism gets heavy emphasis. Canavan and Link write

Although rarely discussed in literary histories as a precursor to twentieth century SF, literary naturalism was a remarkably important step along the road to the Golden Age. Strongly influenced by post-Darwinian developments in the biological sciences and intrigued by emergent theories of human nature in the late nineteenth century, the literary naturalists were central figures in the merging of scientific thought and fiction narrative. (7-8)

For Canavan and Link, Jack London stands out from the crowd of naturalists in this regard, since “among his vast canon are a number of works that are unmistakably SF and point toward twentieth century SF more directly than the satiric fantasies, utopian dreams, and weirdly Gothic tales that preceded them in the nineteenth century” (8). I don’t disagree, but I want to qualify this point. It is my current aim to question the procedural implications in a “merging of scientific thought and fiction narrative”—as if this were a program of some kind with discrete steps or pieces. My reading suggests to me, rather the opposite: any merging of science and fiction was messy and accidental, at least it was before Jack London and company. I’m also unsatisfied by the attribution of an intention to the naturalists that is imputed to be more or less absent before them. A few significant pieces of criticism have made strong anecdotal cases for seeing much earlier authors and works as merging science and narrative. For example, John Beckman’s “The Church of Fact: Genre Hybridity in *Huckleberry Finn* and *Silas Lapham*” argues that Twain and Howells “present a literary record of” the “frustrating conditions” of an “epistemological class struggle” for access to purified fact in the 1880s (28). Lisa A. Long, in “Postbellum Physics and Faith in the Work of Elizabeth Stuart Phelps” details how Elizabeth Stuart Phelps harmonizes religious faith in a heavenly afterlife with the conceptual vocabulary of the physical sciences in 1868’s *The Gates Ajar*.

intend to write a history (or pre-history) of science fiction—only one chapter of my work would fit that bill. Rather, I suggest a reading habit to apply to the vicissitudes of literary regard for science in a particularly fascinating period of the construction of scientific authority and expertise, the time when “science” achieves the coherence, professionalism, and abstract concision (if we can swallow the paradox in this term) to become the “S” in STEM as we know it today.

William James provides a useful example of this achievement when, to isolate “science,” he cuts out contextualizing material from his two-volume *Principles of Psychology* (1890) to produce *Psychology: Briefer Course* (1892). Easing the reader into the “Introductory” chapter of the *Briefer Course*, James admits that the book’s treatment of psychology “as a natural science...requires a word of commentary.” There is “one Science of all things...far from being realized,” which James holds out as the ultimate object of scientists’ and philosophers’ faith. “Instead of it,” James writes,

we have a lot of beginnings of knowledge made in different places, and kept separate from each other merely for practical convenience’ sake, until with later growth they may run into one body of Truth. These provisional beginnings of learning we call ‘the Sciences’ in the plural. In order not to be unwieldy, every such science has to stick to its own arbitrarily-selected problems, and to ignore all others. Every science thus accepts certain data unquestioningly, leaving it to the other parts of Philosophy to scrutinize their significance and truth. (11)

This statement prepares readers to accept the “arbitrarily-selected problems” of James’s volume and serves as a final defense of the method of his abridgement outlined in the preface. He leaves out “all the polemical and historical matter, all the metaphysical discussions and purely

speculative passages, most of the quotations, all the book-references, and...all the impertinences, of the larger work,” though he offers “the teacher” the option of “orally restoring as much of this material as may seem to him good, along with his own remarks.” Through the abridgement, James hopes, “the general point of view, which I have adopted as that of ‘natural science’...gain[s] in clearness by its extrication from so much critical matter and its more simple and dogmatic statement” (3). Simply put: to isolate the *science* in his text, James cuts out its contextualizing rhetoric (“polemical and historical matter”), its bibliographical apparatus, and—most significant for my purposes—its “speculative passages.” In the following chapters, I study other such literary acts of isolation, along with opposite and complementary moves like confusion, concatenation, and confrontation. These acts of isolation, confusion, concatenation, and confrontation of science often involve speculation as the indirect object of the operation (isolation of science *from* speculation, confusion of science *with* speculation).

To understand such gestures as rhetorical and epistemological moves, I examine several decades of broad interaction between scientists, writers, and imaginative literature. Such understanding will not result from exclusive focus on a particular author, science, or mode of writing. Why does William James explain his act of isolation to begin his work of distillation? Why issue such a distillation in the first place—what is gained, in the span of two years, by the “extrication” of a “dogmatic statement” of natural science from its contextualizing “critical matter?” One will readily, almost automatically, look closely at James’s career, his thought, and his individual impact on the US intellectual landscape, or alternatively to the broader developments of pragmatism, as a late-nineteenth century movement, to answer these questions. Pointing to the relative youth of psychology as a discipline, one might conjecture that two years would not have been sufficient to establish such a sweeping yet specific view of the discipline as

put forth in *Principles of Psychology*, in which case a more concise statement would be a fortification. Contrarily, I argue that the most productive manner for understanding James's rhetorical appeal to a conceptualization of science as self-justifying ("dogmatic") would require reconnecting James's text with the extricated material—and more: all the players and points of contact, scientific, philosophical, literary, and cultural, that inform the cognitive horizons of James's text.³ This is my method for teasing out a given author or text's⁴ belief-in-science, as I call it. To experiment in this method, I turn to a time of an explosion of scientific and scientific production in the US which began around the year 1870.⁵

On April 3rd, 1869, *Appleton's Journal of Literature, Science, and Art* publishes its first number. Its contents suggest, in microcosm, the scope, method, and argument of my work and provide a useful primary case study. The number opens with five chapters from Hugo's *The Man Who Laughs*, followed by an unsigned column of musings and a biography of Hugo. The number includes general interest science features, such as "Why We Sleep," attributed in the table of contents only to "A. Hammond, M.D."⁶ and two pieces by Edward L. Youmans, who would found *Popular Science Monthly* a few years later. Falling roughly in the middle of the number is "Linked to a Star," by Dr. J. B. Bouton

³ I am indebted to Donal Harris for the phrase "all the players and points of contact."

⁴ I write "author or text" to express my essential indifference about questions of the locus of meaning. A belief-in-science is evoked by an author or text; it is the belief itself that I want to explicate, which doesn't require demonstrating that an author (or text) does or does not "really" hold that belief.

⁵ "Around 1870" is the title of a chapter in Cummings *Mark Twain and Science*, which contributed to my periodization. Though I rely on a common sense understanding of "scientism" here, I will decline to use this term later and defend my introduction of the replacement term, belief-in-science.

⁶ This is possibly William A. Hammond, surgeon general of the Union Army for much of the Civil War, and thereafter a pioneering figure of neurology and mental diseases. He authored what historians recognize as the first American text on these topics. See "Hammond, William Alexander (1828-1900)."

Bouton's is a quaint first person narration in which Albert Champfield, an accountant and amateur astronomer, reminisces of his fiancée Milly's death due to a heart problem. Stargazing together, they discover an undocumented star, which begins to fade from the sky the night after they first observe it. As it fades, so does Milly's health. The star and the girl die together but not before Albert attempts a desperately unscientific trick to save Milly: he hopes to improve her health by lying to her, telling her the star has returned. The story has the melancholic tones of Poe and the allegorical sweep of Hawthorne—with an important difference: the reader of "Linked to a Star" encounters casual facts of astronomy, especially concerning the classification of stars and the method and materials of astronomical observation. In Hawthorne's similarly-plotted "The Birth-Mark," to use a paradigmatic point of comparison, the reader learns nothing about chemistry, though the tale follows "a man of science, an eminent proficient in every branch of natural philosophy" in "those days when the comparatively recent discovery of electricity and other kindred mysteries of Nature seemed to open paths into the region of miracle," (Hawthorne 28). Compared to earlier fiction with science themes, Bouton's "Linked to a Star" uses concrete, even pedantic, scientific jargon and casually concrete and particular historical reference.

While Hawthorne invokes legendary alchemists, and mentions "the early volumes of the Transactions of the Royal Society" without naming any of the actual members, Bouton, conversely, mentions Joseph von Fraunhofer and William Herschel, both nearer historical referents to Hawthorne and Bouton alike and tellingly specific when compared to the near-mythical names (Magnus, Agrippa, Roger Bacon) invoked by Hawthorne (Hawthorne 38). Bouton's scientific jargon also stands in contrast to Hawthorne's. We learn that Albert uses an "achromatic telescope" whereas Hawthorne's Aylmer has a vague "electrical machine...ready for immediate use" (Bouton 17; Hawthorne 39) Likewise, "moons of Jupiter," "Saturn's rings,"

“binary stars,” and “nebulae”⁷ are all timely and non-legendary references found in “Linked to a Star,” as opposed to the vagaries of alchemical lore referenced by Hawthorne (17). The imagistically-evocative result of Aylmer’s labors—“a crystal goblet containing a liquor colorless as water, but bright enough to be the draught of immortality”—can likewise be contrasted with Albert’s verbose analytical conclusion about the waning of the new star—“From a full second magnitude, it had dropped at least half-way to a third. My experience in studying stars enabled me to detect this to a certainty. It was strange, but; after all, in accordance with the phenomena of recorded variables” (Hawthorne 41; Bouton 18).

Neither limited nor negligent, Hawthorne invokes something different from Bouton when he invokes science, and for different imaginative effect. One source of the differences is that of the setting of the two stories: the vaguely-mythic Hawthornian past and Bouton’s present day. The differences in how and why each author invokes science also index a shift from romanticism to realism, though the mere advance of decades or critical commonplaces about developments in literary fashion will not sufficiently explain this difference. “The Birthmark” was first published in 1843, “Linked to a Star” twenty-six years later. Yet, knowledge of the Herschels’ discoveries, of Fraunhofer, or, for Hawthorne’s science, of Humphry Davy, Volta, and Lavoisier—all active from the 1790s through the 1820s—would have been more or less equally accessible to both writers. The question of how (and why) the artistic appeal of (and to) science has changed so much in two decades still lingers.

⁷ The observation of nebulae affected a renaissance in astronomy at the turn of the 1800s. In *The Age of Wonder* (2003), Richard Holmes explains that William Herschel’s 1789 paper, “Catalogue of Second Thousand Nebulae with Remarks on the Construction of the Heavens” transformed astronomy “from a mathematical science concerned primarily...with navigation, to a cosmological science concerned with the evolution of the stars and origins of the universe.” The paper argued that “the whole universe was subject to enormous fluid movements and changes, over vast periods of time” which “could be observed in the degree of ‘compression’ or ‘condensation’ of nebulae,” (192).

The subtle difference in the two stories' themes—it is too easy to read the historically subsequent publication as what would be called a “reboot” in 21st century jargon—opens onto a corresponding subtlety in the development of the sciences and their place in American society from the 1840s to the 1870s. Toward the end of “Linked to a Star,” a familiar conflict between affect or spirit on the one side and science on the other rises to a climax when the scientific conclusion that Milly is dying clashes with Albert’s romantic hope that she might live, at which climax we read the following clever one-sentence paragraph: “I have no heart to protract this story” (19). A scientist tells it like it is, and concisely—only “heart” would be capable of protracting such a story and yet, ironically, the story is immediately “protracted” by a long paragraph documenting professional observations of the same star by university observatories in the US, UK, France, and Canada. It is as if, having already indulged in unscientific mysticism when he lies to Milly about the resurgence of the star, Champfield feels obligated to report the actual scientific data. The resolution, counterpart to the affect versus intellect commonplace, has the scientist concluding that only in death will some mysteries be resolved: “Never again may that star”—meaning both the actual star and Milly, who is now dead—“shine on me in this fleshy tabernacle of mine; but the time will come—and this it is that cheers and sustains me—when, by my reunion with her, this burden of life shall be lifted, this mystery solved” (20). This conclusion is not too far from Hawthorne’s moral concerning hubris, that there are some places that science can’t or shouldn’t go. Bouton’s moral is nonetheless distinct: we can hope that all mysteries will eventually be solved, but until then we must defer to science. While Bouton’s narrator avowedly doesn’t write to make a scientific point, he nonetheless goes about his task with the same concision and directness we might expect from an accountant and amateur astronomer, and with a clear goal: his “sorrow” seeks “compassion,” his “sad story” expresses “desire [for] the world’s

sympathy” and the relief of “unbosom[ing]” oneself (17). Unlike the Hawthornian narrator, he commits himself to plainness: “I will speak briefly and plainly,” the narrative will be “unadorned,” because if the “unadorned narrative” cannot achieve its sentimental objective, “no amplification” would help (17). Like William James extricates science from superfluous literary apparatus, Bouton’s Champfield sets about his affective, aesthetic task with scientific precision and does so despite the general emotional and scientific confusion of his case.

While Hawthorne expresses *moral certainty*, Bouton expresses *epistemological uncertainty*—and this uncertainty is the object of my investigation. In Hawthorne’s *allegorical* tale, only the *moral* boundaries of science matter. But Bouton’s story brings to light problems of *epistemic* boundaries when a speculative curiosity troubles his otherwise plain, straightforward, sentimental tale:

Once and for all, I do not believe in the supernatural explanation which some excellent people—most of them ladies—who personally knew of the occurrences here set down, attach to them. I hold them to be coincidences only. But upon me they have had an effect as controlling as if the Deity had made to me a special revelation.

(17)

It would be hard to imagine a more complex statement of simultaneous incredulity, skepticism, and affectedness—to say nothing of its incipient male chauvinism.⁸ While our narrator does not “believe in the supernatural explanation” and sees only “coincidences,” at the same time he does not deny the mystical effect they have on him. The narrator also informs us that his narration is not one of passion, but one offered after a “dreary interval of two and a half years” (17). This

⁸ Though other studies have done so as their principal focus, like Nina Baym’s *American Women of Letters and the Nineteenth-Century Sciences: Styles of Affiliation*—and therefore have more of importance to say on the subject than I do, I will have occasion to reflect on gendered resonances of engagements with science and speculation in my chapters on Sarah Orne Jewett and Francis Ellen Watkins Harper.

story, whatever else it relates, confesses an uncertainty about where science ends and “not-science” begins and similarly vacillates about the role speculation has to play in enunciating such a boundary. James, in his turn, writing almost thirty years later, expresses this uncertainty, too, even if it is his imagined reader and not he himself who isn’t sure about how to draw the Venn diagram of “natural science” and “psychology.” Uncertainties like these are to be found throughout postbellum American letters.

Dr. J. B. Bouton, a medical doctor and spiritualist, is characteristic of the unsettled nature of science’s epistemic, professional, and aesthetic boundaries in the postbellum decades. Bouton was known in his time as a spiritualist and charlatan, though he was also a practicing medical doctor. When his séances, held in Liberal, Missouri, were unmasked as fraud he wrote a book, *Two Years Among the Spirits in the Godless Town of Liberal: The Experience of the Famous Medium, Dr. J. B. Bouton, Liberal, Mo.* (1888), in which he claimed to have committed the fraud to “‘cure’ the town of its belief in spiritualism” (Barile 99). The character of Bouton is not unique. We have Twain, cautioning us against speculation while getting caught up in plenty of his own; the conmen in his writing are correspondingly affable (if not laughable) unlike Melville’s comparably reprehensible types. We also have Ignatius Donnelly, an armchair geologist and political pundit who is a favorite of today’s scientistic presentists: he theorized about Atlantis, championed the Baconian authorship thesis, and advocated for free currency regulated by pure government fiat rather than a gold or silver standard. This period also witnesses the scientistic excesses (some would say)⁹ of synthesizers like Herbert Spencer and his

⁹ In an item of “Popular Miscellany,” subtitled “Spencer-Smashing at Washington,” Lester F. Ward defends Spencer from said smashing, though he also notes

I am myself disposed to follow him with little deviation all the way until he reaches deductive sociology and ethics, and I leave him here only because I believe that, owing to unfortunate early political preconceptions, he has himself left the clear path which his entire system logically requires him to follow. (856)

American exponent John Fiske. Today it is exceedingly easy to contrast such characters with those who were “really” doing science, but if one is immersed in the print culture of the period, it becomes strikingly clear that nothing is settled. The appositives that would allow us to identify our sources today—Mark Twain, a novelist; Josiah Whitney, a geologist; Henry Adams, a public intellectual—are not as solid and nowhere near as disconnected in 1887 as they are in 2017. Returning to a period of palpable flux, before the solidification of professional science, the “control revolution,”¹⁰ and the codification of literary realisms, regionalisms, and modernisms (plural here because I mean their tropes, modes, and methods as well as the ossified movements that would be represented in anthologies), I mean to add to the rapidly expanding conjunction of literary criticism and science studies.

Science Studies and Interdisciplinarity: Conjoining Subjects or Objects?

With only a few outliers, my study treats fiction and prose published between 1870 and 1895.

Why those dates? Interest in the exorbitant scientific context of literary naturalism led me to the slightly unconventional chronological parameters of this study and the application of the

Criticisms of Spencer were published by Henry George (*A Perplexed Philosopher* [1892]) and William James (“Remarks on Spencer’s Definition of Mind as Correspondence” [1878]) and can be found in an exchange in *North American Review* between E. L. Youmans and Isaac L. Rice (see the November 1884 and June 1883 numbers for Youmans’ and Rice’s respective contributions). In his intellectual biography of Spencer, Mark Francis writes, in his intellectual biography of Spencer, that the coterie of English “spiritualists” among whom Spencer cut his intellectual teeth offered criticisms of Comtean thought—and were criticized in turn. “Rationalists,” as Francis terms them in opposition to the “spiritualists” (which includes Spencer), “were disliked by spiritualists because they worshipped the kind of abstraction that was concerned only with reason and intelligence. Such abstract thought was not only superficial, but anthropomorphic” (122). His response to Comtean thought led to Spencer’s eventual non-positivist study of psychology and Spencer’s character, which Francis describes with subtle euphemism (as per my emphasis), “as a systematizer of science together with radical religious and metaphysical thought. Some of the cogency of his arguments rested on a sense of familiarity in his reader; Spencer echoed and magnified their ideas, and they, in turn, regarded him as prophetic” (155). He goes on to explain that Spencer’s systematizing served primarily to reconcile metaphysics, science, and religion with its final appeal to the “Unknowable”—and saw utilitarianism and Comtean positivism as its chief enemies.

¹⁰ I refer here to James R. Beniger’s *The Control Revolution*. Though not, to my knowledge, invoked as a proponent of science studies (or any of its cognates), *The Control Revolution* is nonetheless a kindred study, connecting as it does, diverse movements like the development of sociology, the rationalization of infrastructure, and the dawn of Taylor and Ford—all toward the end of reciprocal information production and social control.

disciplinarily agnostic methods of science studies. While naturalism is generally read from 1895 forward into the 1950s and beyond, its scientific and cultural milieu is read backwards, as far as Darwin, Lyell, Lamarck, and even Malthus.¹¹ Contextualizations of this literary movement rely on scientific debates and their cultural resonances that date, more accurately—in the US, at least—to the 1870s and 1880s. I began to wonder what literature written at that time—when authors like Crane, Norris, Dreiser, and London were children, learning to read and forming their own beliefs-in-science—would have to say about science.¹² More importantly, I began to think about the various approaches to the conjunction of literature and science I outline below. The most obvious approach is that of Marjorie Nichols, as championed by G. S. Rousseau, in which one annotates references to science and scientists in literature, as when, above, I note that Hawthorne invokes alchemy and Bouton invokes Herschel. A hardier version of this can be seen in Bender’s studies of Darwinism in American literature or studies of literary naturalism, like those of Donald Pizer and Eric Carl Link, all of which explore how literary works address themselves to or make use of the science they reference.¹³ Gillian Beer’s approach is well

¹¹ Stephen Crane’s *Maggie* is published in 1893 and two years later *The Red Badge of Courage* solidifies his international reputation and sets the stage for US literary naturalism as a movement.

¹²An “unwritten chapter” of this dissertation, along these lines, would treat of *Miss Ravenel’s Conversion from Secession to Loyalty* and how it does (or doesn’t) matter to the plot that Miss Ravenel’s father is a geologist with an enthusiasm for Darwin. The chapter remains unwritten because it would be hard to do better than Jonathan Daigle’s “Miss Ravenel’s Conversion, Evolutionary Realism, and the Moving Equilibrium.” Daigle “define[s] *Miss Ravenel’s Conversion* as the earliest, most emphatic example of evolutionary realism, an important sub-genre that dramatizes the experiences of unremarkable protagonists in ways that assume, support, or illustrate scientifically valid, emotionally satisfying progress” (190). Daigle sees De Forest as having bequeathed this “evolutionary framework” to future realists, who used it “to make sense of history, manage diversity, and correlate individual development with national progress” (190). John Beckman similarly argues that *Huck Finn* and *Silas Lapham* “both explicitly and inadvertently, employing a variety of genres and meta-fictional techniques...present a literary record of” the “frustrating conditions” of an “epistemological class struggle”—a struggle for access to purified fact (28).

¹³ Again, Beckman’s “Church of Fact” bears mention here. Everett Carter’s seminal study, *Howells and the Age of Realism*, has a thorough discussion of the scientific provenance of the realist method. Donald Pizer thoroughly works through the canon of postbellum nineteenth century literature in order to show that “the crude determinism of impersonal evolutionary law” and “faith in private vision” don’t “so much clash as complement each other in a conception of literature and life which is awkwardly complex” (xiii). Burt Bender pursues Pizer’s proposition in both *The Descent of Love* and *Evolution and “the Sex Problem”*: *American Narratives During the Eclipse of*

covered by studies of the Romantic and Victorian periods that investigate the influence of scientific innovation upon the very parameters of literary expression. When done especially well, this kind of study cannot but note mutual influence, as Beer did, and as does Adeline Buckland's recent work on geology and early Victorian realism.¹⁴ Inspired by works of science studies, especially Andrew Pickering's *The Mangle of Practice*, and by recent works in new materialism, especially Karen Barad's *Meeting the Universe Halfway*, I aim to intensify this mode of study.

Though G. S. Rousseau saw the field of literature and science criticism¹⁵ faltering, James J. Bono argues (in the same journal that originally printed Rousseau's landmark essay) that, thirty

Darwin. To correct Americanist ignorance of Darwin, and to show that more novelists than the naturalists were interested in Darwin, Bender traces *The Descent of Man*'s influence on US literature, arguing it had more of an impact than *On the Origin of Species*. In Bender's view, the 1871 publication of *Descent*, goads US novelists into a long argument about the biological, social, and spiritual ramifications of love, marriage, and sex after Darwin. Later, writing during the "eclipse" of Darwin (1890-1940), authors began with the father of evolution and explored in different directions, with different guides (Haeckel, Ellis, Freud, etc.) the "problem of sex"—the meaning of the biological components of love, selection, and competition between/for reproductive pairings. Following up on Pizer's efforts at a concise formal understanding of literary naturalism, Eric Carl Link proposes distinguishing between philosophical, scientific, and literature naturalism in *The Vast and Terrible Drama: American Literary Naturalism in the Late Nineteenth Century*. Philosophical naturalism is "a worldview that precludes the operation of supernatural forces and stresses the notion that all phenomena...can be explained in terms of material causation" (Link 11). Scientific naturalism is a "method of exploration, experimentation, and investigation that focuses its attention on the natural rather than supernatural" (13). Together, Link denotes these as "naturalistic theory," thus defining (American) literary naturalism as literature that explores naturalistic theory at the level of theme.

¹⁴ See Adeline Buckland's *Novel Science: Fiction and the Invention of Nineteenth Century Geology*. Against any "two cultures" thesis and against one-way/two-way street theories of science-to-literature influence, Buckland argues that the golden age of geology (c. 1800—1860) involved a quest for form that was often literary or had literary consequences: "Geology was written into existence in the nineteenth century as much as it was found, discovered, collected, mapped, and modeled;" "The earth had a specific form and...could be traveled over and seen by means of a variety of other forms, moreover (the Grand Tour, the railway routes...) and the hunt was on for the literary, visual, and material forms that would translate as much of the form of the natural world into comprehensibility as possible" (4; 18). Geologists were hence part of a greater—more profound and abstract—shift concerning "how to tell the truth in narrative." Place became "the load-bearer of historical understanding" (19). My own sense the conjunction of literature and science takes much influence from such statements by Buckland, especially when she writes that "over the course of the 19th century, a 'realist' form emerged across literary culture (in which I include scientific writing) that focused on the humdrum, the everyday, the minute, and the particular, and that positively reveled in the raggedy forms such a focus might create" (26).

¹⁵ To avoid confusion and overuse of scare quotes in what follows, I refer to "literature and science criticism" though scholars in the movement, when they use any such title, tend to employ the ambiguous "literature and science," as G. S. Rousseau does in "Literature and Science: The State of the Field." Such a usage makes it hard to distinguish a syntactical conjunction ("In my dissertation I study [both] literature and science") from an interdisciplinary one ("I hold a PhD in American literature with an emphasis on literature and science.").

years later, the field is much healthier. Bono ends his appraisal with a call for “a poetics of science: of understanding science as itself a form of *poiesis*, of making” (559). Bono argues that literature and science studies change how we think about *poiesis*, broadly conceived, today—but they have had less impact on the way outsiders to the literature and science undertaking think about writers of the past and their thought about the relations of science and literature. My dissertation means to add to this latter endeavor. Like Bono, and Sabine Sielke more recently, I find that there is still plenty of work to be done applying science studies to imaginative literature since, as Sielke puts it, “science studies is inextricably entwined...with the cultural work of literary texts that probe the history of knowledge production. When engaging the question of what fiction and poetry know, science studies may even present itself as an effect of an intense discussion on the relation between the sciences and literature that has been going on for centuries” (9). Sielke also suggests, in passing, what I want to work on in substance: the way “what we now know as literature...takes new shapes” when “interrelated discourses such as philosophy and the natural sciences separate” over the course of the nineteenth century (9). Like Sielke, I hold that “interrogating the interrelation between the discourses of the (natural) sciences and literary practices” (9). Studies like mine are a necessary part of “an ongoing endeavor to realign the humanities and social sciences with the natural sciences and to counterbalance the increasing specialization within the various disciplines” (9-10). Sielke emphasizes that science studies “foregrounds that these interrogations try to assess the impact of the sciences—and the ideologies by which they are driven and which they drive—on societies” (12). On such grounds both Sielke and I want a more prominent place for imaginative literature in science studies.

Bono and Sielke suggest that problems of history and philosophy of science are also problems for literary history and criticism, and configuration of problems is the central method

of science studies, as evoked by Peter Galison's "10 Problems for History and Philosophy of Science." To explain the last of his ten problems, doubt, Galison points to the tobacco lobby, the proponents of creationism and intelligent design, and the opponents of international political responses to global climate change as examples of agents who "use doubt as a weapon." Hence historians and philosophers of science must ask

What is controversy? What is scientific doubt in a world where it can no longer be treated purely as an offshoot of this or that scientist's research? What role does [History and Philosophy of Science] have in handling such matters, when one of the standard means of research—examining controversy—would itself reiterate and reinforce one side in a political confrontation with major consequences? (124)

One objective of my dissertation is to bolster the urgency of these matters for literary critics and historians—not just as we write timely books of speculative theory, à la Donna Haraway, Geoffrey Hartman, and Timothy Morton, but as we continue to revise our canons of literary history.

Galison's problem of doubt—and its politicization—viscerally connects to my concern with speculation. Capturing one facet of doubt, Daylanne K. English writes that "like Malthus and Spencer before him, Darwin selects his own form of nationhood as fittest" (4). Galison might suggest that English has, on her way to a literary explication of eugenics in the early 20th century (and to "reiterate and reinforce one side in a political confrontation"), hastily replaced a scientific controversy with a moral one by way of the unarticulated assumption that doing so obviates the scientific questions.¹⁶ Another facet of doubt appears in Brad Evans's literary study of how the "anthropological category of 'culture' could have been imagined and depicted" in the

¹⁶ I find it particularly problematic that she telescopes more than a century of incredibly nuanced scientific debate in less than ten pages in order to do so.

late nineteenth century “without being named or conceptualized” and its stark claim to offer “a prehistory of the culture concept at several sites marked by their failure to deliver the concept as we know it” (3). Evans notes that “everything seems to have been in place for the emergence of the culture concept in the late 1880s or 1890s—so much so, in fact, that it is now exceedingly difficult to think about the period’s aesthetic and social scientific fascinations without turning to the concept in its anthropological sense” (4). In both cases, scholars present an ironically doubtful analysis: intersections of literature and science are read with tacit prolepsis, if not through an actively positivist lens—the prehistory of a concept that failed to appear though “everything seems to have been in place;” Darwin’s self-serving data will be obviated by today’s more enlightened scientists. Ostensibly reading as humanist critics, these readers forward a remarkably scientific ethos. My sense of scholarly wonder comes less from the contrast of present and past, and with fascinating prehistories and the clarity they lend to the production of the present, as with Evans,¹⁷ but with the cacophonous plurality of ideas, concepts, and works of imaginative expression, as recommended by Siegfried Zielenski’s methodology of the cross-sectional cut, which “should reveal great diversity” that “either has been lost because of the genealogical way of looking at things or was ignored by this view” (7).¹⁸

¹⁷ I don’t disagree with Evans entirely. Indeed, I will echo some of his pronouncements, like the following:

When Taine enlists literature as an artifact of national character, when Garland finds work with the Department of the Interior, when Samuel Clemens joins Boas in the formation of the American Folklore Society, or when Frank Hamilton Cushing publishes alongside Henry James in the *Century Illustrated Monthly*, they make clear that the distinction in the preinstitutional period—before the academy establishes departments in either anthropology or English—was slim. (16-17)

But where he sees indistinction presaging the rise of a future category, concept, and/or discipline, I am interested in the muddle of texts and discourses as a subject of synchronic study. Evans wants to herald “the culture concept,” I want to evoke the plurality of “beliefs-in-science” of the era.

¹⁸ So, like Zielenski, “instead of looking for obligatory trends, master media, or imperative vanishing points,” I would rather “discover individual variations [and] fractures or turning points in historical master plans that provide useful ideas for navigating the labyrinth of what is currently firmly established” (7).

A robust, synchronic analysis is even more pressing to delve into a period during which the United States prepares to overtake Britain and Europe in university culture and scientific achievement. Galison offers other problems which are consonant with the work I now undertake: purity, context, the history of argument, and the argument of history. How do distinctions of “pure” science from “basic” or “applied” science, or of “science” from “technology” color the way scholars of American literature represent the encounters of literature and science? Does the mythologized American predilection for practical application¹⁹ explain why a story of Darwinism is, for the most part, the only one we tell, aside from stories of technological breakthrough and scientific racism? Galison, like other science studies scholars suggests the need to study science as subject (not object), a need to find out how science was more ambiguously,

¹⁹ Many scholars invoke a dichotomy between practical, applied science (more or less coextensive with technology) and pure, theoretical science when connecting broader social and cultural movements to “science.” In *The Launching of Modern American Science, 1846-1876*, Robert V. Bruce designates the “scientification” of technology to be one landmark outcome of the “launching” of American science. Noting how “The triumphs of technology were themselves artfully seized upon by the scientists as justification” for the financial support they would claim as guarantors of technological progress, Bruce clarifies that “during most of the nineteenth century, technology actually owed much less to scientific knowledge than the public was led to believe. Yet the scientists’ claims were not so much unfounded, as they were premature. The boundary between technology and science was indeed becoming more flexible and permeable. And as technology increasingly adopted scientific methods and institutions, it even began to qualify as something of a science in itself” (6). Robert J. Scholnick, in the introduction to his anthology, *American Literature and Science*, seems to take this point for granted, when he collocates “science and its offshoot technology.” Affirming that while literature and science “are often thought to be unrelated, if not actually antagonistic,” the truth of the matter is that “literature and science have evolved together in American culture,” Scholnick’s historical benefits from Bruce’s as a footnote (1). Scholnick writes of how “science became province of the professional, while concurrently poets, novelists, and other imaginative writers asserted the autonomy of their art” during the nineteenth century, which leads him to his ameliorative conclusion: “Because American writers themselves have explored the meanings of science and its offshoot technology, literature offers us multiple new perspectives on science as a cultural expression, even as science offers new perspectives on literature” (1; 2). Glen Scott Allen, in *Master Mechanics and Wicked Wizards: Images of the American Scientist as Hero and Villain from Colonial Times to the Present*, sees this matter as central to his thesis. Scott focuses on “the public perceptions of American scientists, not on their private realities,” since this matter of public perception influences who counts as a scientist in the public eye more so than these “private realities” do (6). Importantly, Allen views the dichotomy of science and technology, or of “pure” versus “applied” science, as repeated (if not constituted in the first place) in these public images and perceptions: “in the minds of the American public...technology is science.” Allen thus commits to “a chronological analysis of the popular and lasting images of scientists in the American culture” arguing that “a fundamental anti-intellectualism in American attitudes toward and practice of...science” prevails (7). Making the dichotomy more or less thoroughly analyzed by Bruce and Scholnick a matter of literary-cultural representation, Allen divides depictions of scientists into his titular “master mechanic,” an “inventor who produces practical or at least material outcomes which serve the traditional goals of American progress” and “wicked wizard,” “a theoretician whose work is abstract and with a value either unclear or threatening to the average citizen, as it implies a critique or even an overturning of that traditional idea of progress” (8).

messily distributed across postbellum letters. Ought literary critics account for the resonance of science in literature at the time on its own terms, with as rich as possible a sense of the postbellum context? Or is science something outside literature which we, even further outside (and advanced, if we don a full Whiggish wig) of their respective histories look back on and whose truth we adjudicate? Even if literary critics have been asking similar questions since the 1980s, we have typically done so motivated by thematics of race, class, and gender and, governed by these thematics, science has been taken for granted as a known quantity, an object, rather than as an emergent, amorphous, multi-faceted subject. I examine how precisely those things which we take for granted as *clearly* or *strictly* science *today* were more ambiguously, if not messily, distributed across the various modes of American letters in the 1870s, 80s, and 90s.

The unfolding of institutions of humanist scholarship has tended to obscure its own history concerning what we today would call “interdisciplinary study” and may have also contributed to the tangential (or at least limited) domain of literature and science criticism noted by Bono and Sielke. Since its late-nineteenth century formulation, literary criticism has grappled with questions about the conjunction of art—literature specifically—and science, even if the epochal shifts of New Criticism and then American studies conspire to make Gillian Beer’s *Darwin’s Plots* appear, in 1983, a radically new literary-critical proposition. From the 1860s to the 2010s, many have asked if and how, in the words of Gillian Beer, “the transformed materials of scientific writing become involved in social and artistic questioning” (195).²⁰ Five years before Beer publishes, G.S. Rousseau offers a retrospective of literature and science criticism that presciently suggests some conceptual and disciplinary conflicts even as it unconsciously performs the disappearance of prewar scholarship.

²⁰ Beer’s formulation hides a transformation of its own. In the 1880s, social and scientific questioning would be coupled more readily than Beer’s 1980s “social and artistic questioning.”

Rousseau positions literature and science criticism as an outgrowth of intellectual history about to be obviated by post/structuralism. Writing in *Isis* in 1978, G. S. Rousseau looks back on “literature and science” as an official field “developed in America in the 1940s”—“the start of formal interdisciplinary programs dedicated to research in the field” (583). According to Rousseau, literature and science criticism was an outgrowth of intellectual history that waxed throughout the 1950s and 60s to the point of diverging into various camps or approaches. First are the traditionalist-philologists, who saw their job as the documentation of “scientific references in literature” (584). Rousseau points out the important translation work these scholars did, as they delved into the history of science “before World War II, when the history of many sciences was still unwritten” (584). A second group Rousseau denominates “the theorists,” of which the shining example is A. O. Lovejoy’s *The Great Chain of Being* (1933) a prime example since “he traced the concept of the Great Chain from its Greek origins to the early twentieth century, showing not only how it evolved but giving reasons why. He also considered all the logical arguments against his hypothesis and showed why these were untenable” (585). Marjorie Hope Nicolson is given as a category of her own, and the best example, given her career of firsts and prestigious appointments, “that science and literature was a valid field for research, publication, and professional advancement” (586).²¹ Critiques of these first two groups discuss “The Influence Problem,” noting that influence was being studied “in one direction only: from science to literature, never the other way around” (587). This in turn led to criticism that even one-way influence was not as accurately articulated as possible. Scholars failed to distinguish,

²¹ Two standout studies by Nicolson are “Milton and Hobbes” and “English Almanacs and the ‘New Astronomy.’” In “Milton and Hobbes,” she proposes that Milton’s *Paradise Lost* was “the most magnificent of all replies to Hobbes” one that “read in terms of its own day...was an entirely consistent and supremely convincing one” that “consisted in a refutation of the ethics of Thomas Hobbes” as it justified the ways of God to man. In “English Almanacs” argues that “no study of the influence of astronomy upon the popular mind can be complete that does not seek to determine how far the new ideas were discussed in these little volumes familiar to every household” and considers 100 plus years (and 800 volumes) of almanacs, from 1600-1710, to prove its point (1).

for example, between the actual Newtonianism of Newton and something called “Newtonianism” that appears to have influenced the arts. Then, according to Rousseau, structuralism all but kills science and literature. Foucault, for example, “typified the structuralist intrusion” since “all of [his] books inherently deal with literature and science” (589). This language (“intrusion”) indicates Rousseau’s pessimism as he bemoans that scholars no longer needed to identify a critical pigeon hole (Rousseau wants philologists, theorists, and Nicholsonians) so long as they conducted “self-conscious” or “self-reflective” scholarship (589). Rousseau ventriloquizes why “certain traditional scholars” were alienated by this intrusion and its lack of concern for humanism and its objects of inquiry, leading to a final stage²² called “critical pluralism,” which portends the terrible intensification of the structuralist intrusion, since there is “a rampant proliferation” of critical perspectives and “each type has one or more journals—and it is even difficult to categorize journals accurately, since they now change their orientation without warning” (590). This state of confusion and proliferation is, for Rousseau, the end of his subdiscipline, since none of them will see the point of Nicolson’s simple project, from which Rousseau adapts his closing words: “She noticed the appearance of Newtonian terminology in Pope’s imagery and was content to leave it at that” (591).

I have multiple difficulties with Rousseau’s account, but a brief look back at the history of literature and science will highlight the two most important to my project: the truncated quality of the history (there is nothing before World War II) and the assumption (almost a desire) that bounded, self-contained disciplines with coherent objects and propositions are required for the health of interdisciplinary inquiry. Almost four decades before Rousseau, in 1939, alarmed by

²² Rousseau’s inventory shifts unceremoniously from types of critic to stages of disciplinary development and disintegration. Also, science fiction studies is still an emergent category, at the time of his writing, which Rousseau seems not to take seriously.

a divergence of science and literature emblemized by the Huxley/Arnold controversy, Roger Philip McCutcheon energetically pleads with the Sigma Xi Scientific Research Society to recognize the shared values of scientific and humanistic inquiry. McCutcheon responds to an assumed split between scientific and literary research that anticipates C.P. Snow's definitive "two cultures" argument of 1959 and the ensuing quarrel with F. R. Leavis; both cases point back to an earlier version of that controversy embodied in an exchange between Matthew Arnold and T. H. Huxley.²³ Writing a little more than a decade after Snow's moment, J. L. Holwarth notes the similarities of the Huxley/Arnold debate and the Snow/Leavis debate to propose, implicitly reactivating McCutcheon, mutual recognition between science majors and humanities majors. Though he backs away from its epistemological consequences by the end of his essay, Holwarth attempts to topple what he sees as a false dichotomy between difficult/real science and diversionary/imaginary humanities.²⁴ While the Snow-inspired dogma has it that scientists work with reality while humanists work with fantasy, Holwarth insists on the reality of fantasy and the fantasy of reality.

²³ Snow published an essay version of *The Two Cultures* in 1956. He would go on to present it as a Rede Lecture in 1959, expanding this into book that was followed, in 1963, by a sequel. Sielke argues that Snow's binary frame, in which humanists and scientists basically disregard one another (humanists, in Snow's view, having become less capable of understanding contemporary science than vice-versa) called for three responses. The first response denies Snow, and claims there is only one culture. This is the response of F. R. Leavis, delivered at Cambridge as the lecture "Two Cultures? the Significance of C. P. Snow" and later reprinted in various journals. Matthew Arnold also gave this sort of response in *his* Rede Lecture ("Literature and Science" [1882]) to a Huxley essay, "Science and Culture" (1880) that anticipated Snow. A second response argues for three cultures, imagining sociology as a mediator, and a third response, which Sielke attributes to Susan Sontag "holds that cultures—whether scientific or literary—are always multiple" (Sielke 13).

²⁴ Indeed, if there has been any substantial, concise development as concerns the adversariality of science and its humanistic other, it would have to be the strange—and now common sense—reversal that happens here. In 1892, racial uplift activist Anna Julia Cooper distinguishes between science and reason, which are merely contemplative, and humanistic faith, which actually accomplishes change in the world (in her words, it "works"). By the time of Holwarth's intervention—if not earlier—the situation is reversed: science gets things done while the humanities sit around and think about things. I get into the sources of this shift in chapters three and four.

Holwarth stands as a corrective to Rousseau, but Harry Hayden Clark suggests that literature and science were entwined at the very birth of professional literary scholarship. To the extent that literary production from 1860-1910 can through a confluence of various trends be defined as a period, Clark argues, science—especially the scientification of literary scholarship—is “more important than generally realized” (109). Studying the “vogue of Taine” specifically, Clark argues “the philosophical and sociological implications of evolution” offered “a new frame of reference” for literary criticism, leading people “to explain literary art and creativeness in terms of the physiological-psychological study of the individual considered as determined by both heredity and environment, by time, place, and race” (109). Clark laboriously catalogs postbellum responses—pro and con—to what he calls “the influence of science on literary criticism,” or, more elliptically, “evolutionary criticism.” Henry James and William Dean Howells both review works by Taine in 1872, an especially noteworthy year.²⁵ Clark’s broad conclusion is that this “evolutionary criticism” shifted both public and academic understanding of literature away from “subjective impressionism and a condescending judicial spirit” toward a new capability to understand authors as “socially significant,” that is as “spokesman of the age which produced them” (137). Especially in graduate schools, “evolutionary criticism” transformed “existing books” into something like “a ‘given’ in geometry” and, with the book as given, “the problem was ‘to prove’ not how good they were but to explain historically what elements and influences entered into their development and why they had been fittest to survive competition with other books” (137). Clark goes on to dispassionately note that this mode of literary scholarship was largely out of fashion by the time of his writing (1955) anticipating the

²⁵ Despite an unfavorable review by Howells, Taine would later be instrumental in the publication of Silas Lapham in France.

earliest version of C. P. Snow's "Two Cultures" thesis, which he published in a 1956 number of Britain's *New Statesman*.

The overall picture presented by these interventions, despite their protestations somewhat to the contrary, is of literature and science conjoined for the lifespan of modern literary criticism so far—at least at the level of literary *criticism*. I want to revive this insight, but also add to it: literary critics find scientific purchase on their subject because of an existing sense that literary production and scientific inquiry are already—if only occasionally—*at work on the same thing*. Clark references Henry James's admiration of Taine extending from an 1872 review essay to a 1912 letter mentioning Taine with praise, and the period from 1912 to 1939 (the date of McCutcheon's intervention) is shorter period than that of James's career. The separation between McCutcheon and Clark is shorter still. Yet the increasing compartmentalization of disciplinary configurations has almost totally obscured the configuration of problems concerning how critics and historians might conceptualize how scientific and literary learning and knowing involve one another. Gillian Beer and Donald Pizer each contribute conceptual models for literature and science criticism that deserve further consideration in this regard.

Gillian Beer's model of mutual influence, whereby romanticism influences Darwin, who influences Victorian realism in turn, has inspired plenty of British literature scholarship but is difficult to apply to American literature: it is hard to find scientists inspired by American literature in the ways that Beer shows Darwin to have been influenced by the Romantics. At the same time, Beer's more general devotion to the mutual resonances of terms and concepts—how something like "natural selection" can be both literarily and scientifically meaningful at once—has only recently been seen in studies of American literature.²⁶ Alternatively, Donald Pizer, in

²⁶ One of the earliest studies that applies this view would be Cynthia J. Davis's *Bodily and Narrative Forms: The Influence of Medicine on American Literature, 1845-1915*. It is specifically when she sets to work on textual

“The Problem of Philosophy,” examines novelistic appeals to philosophical or scientific ideas, that is, what it means artistically for a specific scientific or philosophical idea to appear in a given passage of a given novel. For Pizer it is important that we distinguish carefully between, say, a character’s idea, a narrator’s idea, and an author’s idea. Dreiser being a Darwinian is crucially different than Dreiser’s narrator expressing Darwinian thoughts. Broadly speaking, then, these two figures (Beer and Pizer) help us understand the influence exerted between entities (science and art) and distinguish between the uses of the ideas, concepts, or languages of these entities in the indices of influence.

Both Beer’s and Pizer’s approaches are valuable but both are limited in that they rely on the self-evident separation of “science” and “literature.” My study of disparate sets of authors and texts and their attempts to give form to an amorphous thing called “science” through acts of speculation (and skepticism) seeks to resolve this limitation, which risks ossifying as either objectivity or fetishism—or both. Studies of Darwinism in literature and culture demonstrate such pitfalls when they approach an “objective” truth that the most important thing about “science” (objectively conceived) in the 19th-20th centuries is Darwinism (ossified as a controversy between secular science and spiritual/religious humanism, or as social Darwinism, or as science’s turn toward history). Such an ossification evokes another potential limit of

“attempts to grapple—both thematically and formally—with an increasing tendency to turn to embodied existence as both essential referent and source” that Davis accomplishes something like Beer’s manner of attention to meaning-making practices (2). Other recent examples include Maurice S. Lee’s *Uncertain Chances: Science, Skepticism, and Belief in Nineteenth-Century American Literature*, Jennifer J. Baker’s “Emerson, Embryology, and Culture,” Travis M. Foster’s, “Jewett’s Natural History of Sexuality,” and Sarah Wilson’s “Black Folk by the Numbers: Quantification in Du Bois.” To be clear, I don’t include among these studies works like Burt Bender’s *The Descent of Love: Darwin and the Theory of Sexual Selection in American Fiction, 1871-1926* or Ronald E. Martin’s *American Literature and the Universe of Force*. Though they might seem like candidates, and they do qualify as literature and science criticism, Bender and Martin’s studies treat literature and science as discrete, separate, wholly formed entities that bump into each other: Bender studies novelistic responses to Darwin; Martin chronicles an American predilection for a particular sense of physics. Such works, valuable as they are, are simply different scholarly procedure from Beer’s work on Darwin, or Sarah Wilson’s careful meditation on the overlapping poetic, philosophical, and statistical resonance of “twoness” in Du Bois.

literature and science criticism: the assumption local conjunctions of a particular science, author, and/or literary movement are the most significant meetings of literature and science. My dissertation examines the muddle of postbellum writing and how a disparate set of authors and genres give implicit and explicit forms to vague entities like “science,” “imagination,” “speculation,” and “literature.” Bringing together history and philosophy of science, print culture, and science fiction studies, *From Jeu D’Esprit to Exact Science* offers a new reading of both nineteenth century science and fiction while also bringing the cognitive crucible that gives rise to terms like “pseudoscience” and “science fiction” to the fore. Recent work by John Bruni, Maurice Lee, and Shawn Salvant offers insight into the co-determination of scientific and literary production, bringing together the figures indicated by Beer and Pizer in studies of American literature, but these works fall chronologically to either side of my study.²⁷ My focus on speculation as it converges with and diverges from “exact science,” then, also contributes to the study of realism, regionalism, naturalism, and modernism by attending to a relatively neglected period of US literary history.

My aim is to move toward a trans- or post-disciplinary scholarly ethos that privileges the configuration of problems over that of disciplines, much in the way suggested by Sielke when

²⁷ By "resituat[ing] the prose narratives of Dreiser, Wharton, London, and Adams within a crucial moment" when evolutionary theory and global imperialism "destabilized social categories of race, class, gender and citizenship," Bruni argues, in *Scientific Americans*, that these authors thought "is unmistakably relevant to current popular and scientific debates about global and environmental imperialisms" (9). Bruni argument is very similar to mine: by looking at popular science journalism alongside these authors, he claims, we see that "rather than getting their ideas about evolution second-hand, filtered through a social Darwinist ideology, [the authors] actively determine what evolution means" (3). Maurice S Lee's *Uncertain Chances* examines how changing concepts of chance affected science, technology, politics, bureaucracy, and imaginative literature in the antebellum US. Shawn Salvant's *Blood Work: Imagining Race in American Literature, 1890-1940* studies the role that "blood" and cognate imagery and metaphors play in American literature as one way of charting the early twentieth century shift from a biological to a metaphorical conception of race. In Salvant's view, this unexamined shift is currently biting critically-conscious intellectuals in the proverbial ass: "No longer under pressure to justify itself scientifically, race can enjoy all of the luxuries of being an effect of language. Now the problem with race is not that it pretends to exist when it does not...the problem with race as metaphor is merely its lack of a denotative referent, which, for a form of language at play, is no problem at all" (3).

she invites us to engage questions of “what fiction and poetry know.” For example, rather than narrate the meeting of disciplines (geology, engineering, civil administration, literature), I examine, in the next chapter, how these disciplines become intelligible by configuring the problem of the legitimate, efficient extraction of value. In chapter four, for another example, I don’t simply compare Sarah Orne Jewett and the nascent, statistically-driven social sciences, I examine how questions about the meaning of statistical data produce social science and literary regionalism as overlapping answers to the same question. In each case, my focus is on questions—or problems—as preeminent loci of meaning-making, rather than the autonomous, self-determining agents who respond to (or cohere by responding to) the questions.

Speculation is the meta-problem of all problems I encounter in the period of my study. “What if this were true?”—a question that conjures newly rigorous classifications and bureaucracies of science as well as charges of pseudoscience; a question that conjures extrapolative fiction, utopian nonfiction, scientific treatise, editorial and theory alike. Instead of pursuing objectivity concerning what a given science, discovery, or scientist *was*, or advancing a fetishism concerning its impact on literary movements, my study instead follows the vicissitudes of speculation by limning the conceptual contours of gradualism and descriptionism, two new (as of the mid-nineteenth century) ideas that would conquer (for the most part) an earlier era’s commitments to their opposites, catastrophism and theoretical explanation.

Significantly, as scientific *disciplines* become more established, *trans*-disciplinary concepts like gradualism and descriptionism become less visible.²⁸ At an important point in

²⁸ This is possibly even an *outcome* of the triumph of descriptionism, which holds, essentially, that to adequately describe something is to know it. When descriptions are easily observed—ideally, *measured*—they can be communicated directly and the philosophical (to use the term almost with a derisive connotation) basis of observation, measurement, description need no longer be, itself, understood or communicated. One need not know what a meter *is* or how it was derived in order to accurately state “The object is moving at *x* meters per second.” So, a geologist today need no longer talk about what gradualism is, or why descriptionism is productive; she can skip to *describing* the *gradual* movements of tectonic plates or erosion or volcanic flow.

Twain and Warner's *The Gilded Age*, a central character surveys a piece of land for coal deposits guided by his certainty of "the uniformity of nature's operations in ages past" (214). What we might read now as a casual affirmation that, as we say today, geology "is a thing," closer to the time of Twain and Warner's writing, was a still-debated concept: uniformitarianism—in other contexts known also as "gradualism"—was the relatively new idea that the constant activity of *uniform* geological processes adequately accounts for the history and present shape of our planet. "Uniformitarianism," again in the guise of "gradualism," was also applied, by Charles Darwin, to natural history in the form of biological evolution; the status quo counterpart of this concept was *saltationism*, which allowed for sudden, drastic leaps (Latin: *saltus*) in the natural history of Earth's flora and fauna.²⁹

To limn such conceptual controversies is especially problematic—and necessary—because controversies that happen at the level of concepts, propositions, and ideas are easily obscured by controversies attached to names (Darwin) or particular conclusions (humans evolved from apes). The plethora of controversies, debates, and conflicting experimental findings obscures the more difficult explication of the polymorphous, unruly conceptual skirmishes surrounding or undergirding them. The debate between descriptionism and theory in the sciences—or, in other words, whether the goal of the scientist was to arrive at *accurate descriptions* of what happens or *true explanations* of why things happen—was even more ubiquitous, diffuse, abstract, and longer running. Engaging in these debates meant engaging in *speculation* (if *x* were true, then perhaps *y* follows), since the authority of fact-, data-, and method-driven measurement and research was still an unsettled element of the controversies

²⁹ As with so much other scientific terminology, Whewell appears to have coined this term, and its counterpart, *catastrophism*—the view that, occasionally, major geological events not assimilable to the regular laws of nature and astrophysics contributed to a non-reversible, non-repeatable, forward moving geological story of the planet. See Rudwick, 170-171.

rather than the general umbrella under which the controversies were prosecuted. Like Lorraine Daston and Peter Galison catalog the rise of objectivity as a specific visual culture and technology in their massive *Objectivity*, my dissertation catalogs the increasing alienation of ways of *looking* as—to reprise my title—*speculation* becomes fantasy or *jeu d’esprit* and *observation* becomes exact science as this alienation takes place across literary media.³⁰

The Cacophony of Speculations and Sciences

“Increasing alienation” is a decisive phrase, but despite the apparent decisiveness of the changes in scientific method in the second half of the nineteenth century, I study the period from 1870 to 1895 for its cacophony of deliberation, delimitation, prognostication, and prevarication about science—all of which hinges upon the ultimate speculative questions brought up by the metascientific theoretical developments of gradualism and descriptionism. Science and speculation may be relatively easy to define as dictionary terms, but constituting their definitions as a matter of their historical involvement proves a more difficult accomplishment. It should be a simple question: what role does speculation play in science? Answers come fluently from public intellectuals, like Neil De Grass Tyson, who explains how, when one considers the big picture, science has been fundamentally complete since the early 1600s and the decisive turn to experimental observation of that time. If this turn was a speculative leap (Tyson would likely argue that it was not), it was the correct leap and such speculation was thereby (and now and forever) mooted. Research programs have only been more rigorously defined and compartmentalized since then—but never thrown out or categorically rethought (nor need they

³⁰ I hesitate to use either of the standard formulations here, either “print media” or “literature,” opting instead for the construction “literary media.” My intent is to preserve the expressive rather than the transactional connotation of *medium*—something that enables an appearance rather than facilitates a crossing.

be).³¹ Speculation has likewise become more of a definite, known quantity, even if, unlike science, there is less agreement as to its value: speculation is creative, intuitive, extrapolative imagination of possibilities, admitting of greater or lesser degrees of lucidity. At different times, in different representative thinkers, speculation appears to either drive scientific inquiry or delude, inebriate, and exacerbate discourses deemed antagonistic to scientific knowledge (whether nonscience, pseudoscience, mysticism, metaphysics—the list goes on).

Consider Bellamy's *Looking Backward* (1888) or George's *Progress and Poverty* (1879): both of these texts speculate on a radically different future based on the possibilities opened by developments in science and technology, and the impacts these could have on political economy. From our contemporary perspective one is a work of fiction, the other of political economy—the latter permitted a greater claim to science than the former. Throughout the following work, I hold that deferring taxonomic demarcations (fiction/non-fiction, science/non-science) and focusing on speculative affinities between texts provides a clearer picture of the actual antagonisms in the development of human culture, expression, and knowledge production (gradualists vs. catastrophists, not geologists vs. clergy, or artists vs. engineers). I will elaborate this methodological pretense—deferring commonplace taxonomic operations—in chapter three, in which I consider Ignatius Donnelly, a populist politician whose copious (if casual) scientific reading fueled his speculations about the proto-culture of the inhabitants of Atlantis, who were, in his theory, likely the survivors of a prehistoric meteor impact. Donnelly also used math (liberally), claiming to decipher Francis Bacon's hidden code in the works of Shakespeare, an undertaking which finally amounted to professional cryptologists dismissing him as plainly bad

³¹ That is, there has been no serious movement to stop doing experiments and start doing something else. For the relevant words of Tyson, see Klosterman, Chuck. *But What If We're Wrong?* New York: Blue Rider Press, 2016, 99-101.

at math. I hold there is plenty of insight to be gained by forestalling the separation of well-defined (and precisely-executed) endeavors from the mavericks that somehow defy their proper classification. I mean to point out that the question of speculation is not at all as simple and straightforward as is the institutionalization of scientific authority because the very meanings and values assigned to speculation are historically emergent and fluid. In fact, these meanings and values are historically *divergent*, as are the relations between speculation and science. The emergence of these divergences abuts—if it does not directly contribute to—the divergence of what gets called “literature” from what gets called “writing,” that is, the categorical bifurcation that, at the turn of the twentieth century more readily applies “literary,” as an adjective, to poetry and narrative prose and not to ethnography or scientific reports or philosophical treatises.

Podmore’s “What Psychological Research has Accomplished” illustrates the relation of these two divergences. In his 1895 *North American Review* article, “What Psychological Research Has Accomplished,” Frank Podmore (British) roundly criticizes Charles Minot (American) for the latter’s hastiness in his criticisms of the work of the Society for Psychological Research (SPR). Venturing no truth claims about telepathy (the subject of Minot’s criticism), Podmore rather points to the methodological mismatch of Minot’s application of literary or journalistic criticism to a scientific undertaking. Specifically, Minot’s criticisms come from incomplete reading of the SPR’s publications and from a preconceived intent to convince readers that the SPR are doing it wrong. He climactically “demur[s] to Professor Minot’s statement that ‘the leaders of the Psychological Society are literary men’ — if that means that their chief claim to distinction is their literary work,” and goes on to list a number of the society’s prominent members, including “William James, of Harvard” (343). He concludes:

I do not think that any one [sic] who is acquainted with the history of science at large during the last few years would consider that any one of those gentlemen was adequately described as a literary man. And I must again demur to the lesson which he draws from his unfounded assumption. To my thinking a man should be judged by his work; and even a literary man, without any scientific pretensions, when he has taken the trouble to study with candor and care the subject on which he writes, may on occasion be worth the hearing. (343)

With this conclusion, Podmore formalizes a gesture implicit throughout his article, namely, that being “literary” is somehow fundamentally and obviously separate from being “scientific.” My work, then, wants to place, as one position among many, whatever it is that Podmore hoped to achieve by “outing” Minot (or vice-versa) as a “literary type” rather than a “scientist.” Or, to return to William James’s *avertissement*, I venture a fuller depiction of the literary and scientific situations that make his caution, when speaking of “evolutionary speculations,” intelligible.³² I study the various deployments of speculation to arrive at this point, in 1895, after which the emergence of science fiction and literary naturalism institutionalize the separation of “science” and “literature” by addressing them to one another. In other words, at the dawn of *properly named* literary naturalism and science fiction, the rhetoric and politics of Snow’s “Two Cultures”

³² An example of what James might have meant by evolutionary speculation:

Dangerous things fill us with involuntary fear; poisonous things with distaste; indispensable things with appetite. Mind and world in short have been evolved together, and in consequence are something of a mutual fit. The special interactions between the outer order and the order of consciousness, by which this harmony, such as it is, may in the course of time have come about, have been made the subject of many evolutionary speculations, which, though they cannot so far be said to be conclusive, have at least refreshed and enriched the whole subject, and brought all sorts of new questions to the light. (13)

This line of reasoning—still popular with proponents of sociobiology and evolutionary literary criticism—was famously called into question by Dawkins’s *The Selfish Gene* (1976), which shifts the focus of evolutionary biology from individuals, collectives, and their discrete behaviors to the strategies and memetics of replicators (the gene, rather than the organism, being Dawkins’s atomistic replicator).

is all but guaranteed as institutional balkanization and tribalism deepen with the unfolding of the twentieth century.

From the viewpoint of my study, 1895 stands as a kind of limit beyond which a change of state occurs; the possible becomes inevitable. Before 1895, though, the problematic relation of speculation to science is ubiquitous and cacophonous: a muddle of voices, ideas, and imperatives as suggested by an unsigned sketch appearing in an 1885 number of *Catholic World*. “The Scienceville Society for Psychical Research,” possibly written in response to the founding of the American Society for Psychical Research (ASPR), is a humorous allegory pitting various kinds of scientists and intellectuals, pseudo and real, against one another as they attempt to organize a society for psychical research on the English model.³³ The hero of the *Catholic World* sketch—with a clear spiritual affiliation to the journal—is a Mr. Inquirer, “a young Catholic lawyer, whose rising reputation had procured him the compliment of an invitation, though he had little in common with the others” (290). In a room full of Kantian metaphysicians, Darwinian materialists, and dilettantish club women,³⁴ Mr. Inquirer’s position on the question of matter versus spirit is presented as the most reasonable position. The only other wholly reasonable member is Professors Physics. The straightness of these two characters comes across in the

³³ A collection of English scientists organized the Society for Psychical Research (SPR) in 1882; William James served as its president from 1894-1895. An American branch, the American Society for Psychical Research (ASPR) was organized in 1884 with Simon Newcomb as its first president (Newcomb's polemics on the lethargy of "abstract" and "exact" science in the States were published in the *North American Review* during the editorship of Henry Adams). See Christie, “Societies for Psychical Research.” Both organizations existed to apply scientific methodology to the study (and often debunking) of so-called psychical phenomena—with spiritualism at the top of the list. The avowed objectivity of these organizations was always a fractious matter. After the SPR exposed one fraudulent medium, Arthur Conan Doyle led a mass resignation of almost one hundred society members to protest the SPR's anti-spiritualist bias (Nelson 159). Both the SPR and ASPR still exist today, though they are notably less esteemed: the euphemism "parapsychology" replaced the term "psychical research" as psychology became an established scientific discipline.

³⁴ "Mrs. Statistics, who has published voluminous tables showing the relation of teething to the moral sense; Miss Bustle, who seeks to 'elevate' the poor by teaching them music; and Miss Rosa Gush, who belongs to everything" (290). Such chauvinism repeats that of Bouton's narrator, Champfield, when he accuses women of superstition.

brevity of their respective characterizations as compared with the lengthier caricatures of the others, like the above-mentioned women, or one Dr. Positive,

learned in anthropology, who has discovered several new ape-like features in man. He has dissected assiduously to find the soul, and has satisfied himself that there is none to find. He scorns all that is called supernatural, but believes in the self-evolution of matter from nothing and in the transformation of the inorganic into the organic. (289)

The assembly has only begun to discuss how to study psychical phenomena when it is sidetracked by a debate about the mind/body, spirit/matter problem, causing Professor Physics to nominate a committee to design a research program and Mr. Inquirer to decline to join the society.

Readers are given to understand that Mr. Inquirer declines membership because the group rejects his dualism. Inquirer posits two planes of existence, knowledge, and phenomena that must intersect at some point. The other members are all, in some way, monist, except for perhaps Prof. Physics, who simply wants to pass over any “spiritual” topics in silence, and such is Mr. Inquirer’s sticking point:

Mr. Inquirer said that he was unwilling to introduce a subject so distasteful to most of the members, but he could not see how it was possible for them to discuss what is commonly called the supernatural, unless they could agree on a few facts of primary importance, such as the existence of God, the freedom of the will, and the end of man. (295)

Dr. Positive speaks for the group here, “exclaim[ing] that really he could not and would not go back to Sunday-school. They were there for science!” (295). It is at this point that the president, Professor Physics adjourns the meeting by forming the committee.

While this sketch would serve as evidence of a late-nineteenth century antagonism between science and religion,³⁵ I find it to be more important as a measurement of the internal diversity of scientific habits and attitudes during this period. Dr. Positive affirms that “He bow[s] only to the voice of science” causing Professor Physics to point out that “Science was the one power they all acknowledged, and, however disguised by mystical phraseology, it was the one power all men adored” (292). If, as Professor Physics and Dr. Positive assert, this is indeed true, to affirm as much is close to meaningless. Dr. Positive is a hardcore positivist, Professor Dubitans is an agnostic when it comes to both matter and spirit, and a Mr. Festinans, possibly a caricature of John Fiske, who “wears a portrait of Haeckel in a locket,” “criticises the Darwinian theory as too limited in scope” (290).³⁶ Two other attendees, Mr. Amateur and Mr. Soarer are depicted as variations of lay science enthusiasts who actually have little or nothing to add to the conversation. This single meeting represents the cacophony of deliberation during the decades following the Civil War that simultaneously elevates science (to Science, one wants to write) and debates the actual content of the term. A general *ethos* of speculation, that is, trying to imagine or extrapolate what science could possibly be and do, oversees various positions that themselves tend to favor either exact science (and a weaning away from speculation) or speculative creativity (some effort to harmonize what is observable to what might be thereby implied). Mark Twain and Charles Dudley Warner side with exact science (along with so many others) because

³⁵ Or the “conflict thesis,” advanced by writers like John William Draper and Andrew Dickson White, whose inventions (rhetorically speaking) created *A History of the Warfare of Science with Theology in Christendom* (the title of his 1896 book)—this despite the fact that, as Ronald Numbers points out in his introduction to *Galileo Goes to Jail and Other Myths About Science and Religion*, the harmony of science and religion had been a more common trope for most of the nineteenth century (3).

³⁶ This Mr. Festinans “has made some really meritorious researches in natural history, but, finding that field too small for his genius, writes and lectures on ‘the origin of life,’ ‘the origin of religion,’ ‘the probable nature of man ten million years hence.’” This last topic can be compared to Fiske’s *The Destiny of Man Viewed in the Light of his Origin* (1884).

they want order, profit, and progress. Ignatius Donnelly, Sarah Orne Jewett, and Francis Ellen Watkins Harper dissent, all through different engagements with speculation and science. Though such conflict promises a complete polarization between science and speculation, such is not achieved in the period of my study; it is the rather accomplished fiction of the era of C. P. Snow, as I've discussed above. The waxing of the polarization can also be witnessed in the “materialistic pessimism” of naturalist fiction and the speculative play of early science fiction. As an ephemeral piece of periodical prose, “The Scienceville Society for Psychological Research,” with its affirmations of the unity of science rendered farcical by the cacophony of perspectives, captures a useful image of the sciences as they appeared on the ground, underscoring another concept central to my argument: belief-in-science.

Beliefs-in-Science and Metascientific Concepts

In the four chapters of my dissertation, I explore the metascientific tools and concepts at work in various beliefs-in-science as conveyed and put into practice by a diverse collection of authors. Though professional academics canonize what is and is not science during this period (and beyond), belief-in-science continues to be/come multiple. If we compare the ambivalence of Bouton's protagonist, bound by the rigors of astronomy yet profoundly affected by some apparently supernatural coincidences to (on the one hand) the cacophony of beliefs-in-science represented in “The Scienceville Society” and (on the other) William James's confidence in practical, methodological, and philosophical unity of science, we have the clearest possible picture of the ongoing change this period takes part in. An uncertainty concerning the limits of science and its interface with other fields of meaning around the close of the Civil War will eventually give way to the professional academic's authoritative (if not authoritarian) canonization of what is, and what is not, science—where it can and cannot go. But the clamor of

the “Scienceville Society” never truly recedes: public intellectuals, artists, and readers are constantly expanding and assailing beliefs-in-science.

The term, “belief-in-science,” does the work that “scientism” can’t do—indicating the horizon of sense, belief, and action entailed by a certain conception of science. In his *Keywords* entry on “science,” Raymond Williams points to a problematic ambiguity of “scientism”: beginning in the last third of the nineteenth century “scientism...meant positions characteristic of science, but in its [current] critical use indicates the (inappropriate) transfer of methods of inquiry from the ‘physical’ to the ‘human’ sciences” (280). In the early days of this dissertation, I had wanted to use “scientism” in the traditional sense Williams defines, but realizing that it would continuously suggest the contemporary judgement against scientific chauvinism, so to speak, I settled on the term “belief-in-science.” I now consider the latter term to do a bit more than indicate “positions characteristic of science,” instead using it to name the general sense of belief or worldview that correlates to a particular conception of or engagement with science.³⁷ Belief-in-science is a standpoint, self-conscious of “science,” that looks upon the world and makes other meta- or para-scientific conclusions, or, as axiomatically formulated as possible: given that science is/does x , it follows that y (and z and so on). This means, also, that there is not just one belief-in-science characteristic of the period I study; rather, the whole point of my interpretive labor is to tease out the noisy host of beliefs-in-science that make the nineteenth century imagination such an inexhaustible topic of scholarship. For some, like Donnelly, belief-in-science animates a universe that is much fuller and more wonderful than otherwise

³⁷ One contemporary commonplace that expresses a distinct belief-in-science, holds that “they can put a man on the moon, but they can’t...”—this is a cynical belief-in-science of the kind that worries about shrimp treadmills, a belief that sees science as thoroughly detached from the needs of common people. This science discovers truths that are too hard to understand and don’t matter when we do, all the while ignoring a world of practical problems that will—only for this reason—remain unsolved. This is the belief-in-science studied by Glen Scott Allen under the image of “Wicked Wizard” as opposed to “Master Mechanic.” The topical relevance of this “belief-in-science” has recent flourished as the Trump administration puts forward its “America First” energy policy.

conceivable. Francis Ellen Watkins Harper and other writers of racial uplift and social reform worried just the opposite: science would obviate, if not eradicate, the concept of spirit-driven human enthusiasm to make the world better.

In the mid- to late-nineteenth century, beliefs-in-science are subject to the conceptual innovations of those two significant but under-scrutinized shifts mentioned above, the shift from catastrophism to gradualism and from theory- and explanation-oriented to description- and measurement-oriented science. Ideas like catastrophism, gradualism, description, and measurement can be understood as “metascientific tools and concepts” that inform scientific inquiry, sometimes imperceptibly, especially at times of upheaval. As David Wootton suggests in his recent history of the Scientific Revolution, *The Invention of Science*, I find the study of metascientific tools and concepts to be a more powerful critical undertaking than studies which take a discipline or discourse for granted (such as in a literary history that asks what authors did with Darwin without asking what Darwin did, or how a thing denominated “Darwin” coheres in the first place). For example, Wootton offers “discovery,” which “is not in itself a scientific idea but rather an idea that is foundational for science.” It is Wootton who suggests the term “idea,” reasoning that “it is difficult to imagine how one could have a form of science...which did not claim to have made progress and did not present that progress in terms of specific acquisitions of new knowledge...*any* scientific culture would need an alternative set of concepts that fulfilled the same function of marking, and inciting, change” (103). The changes evidenced by the appearance of such metascientific tools and concepts are examples not of the “relativist historian’s” cherished “controversies,” but of broad, “silent,” noncontroversial changes, that happen so gradually and vaguely that they pass almost without notice (246-247). My goal is to

make such locally noncontroversial changes more globally controversial for critics, historians, and readers of today.

Nor is the study of nineteenth century literary innovation without analogous critical insight. To explain how the “suspect enterprise” of “imaging Utopia” could appeal to readers, Kenneth M. Roemer suggests that authors of utopian novels activate “perceptual tools” at large in readers’ culture to work upon evidence and judge “correlations between the utopists’ imaginings and the reader’s realities” (81). Roemer suggests “centuries-old Millennial desires for a Kingdom of God,” the “eighteenth-century enlightenment” and “history viewed as progress” as “crucial perceptual tool[s]” (81-82). For Roemer, such tools—“in the forms of shared worldviews, ideologies and values that invite readers to ‘see’ utopia as...[a] guide to the past, present and future”—would intuitively need to exist for a utopian text to take hold of a reading public. My work aims to catch sight of these tools at work in places other than the obvious, canonized places (utopian novels, proto-science fiction, Darwinist literary naturalism).³⁸

Gradualism and descriptionism are like two stones plunked into the pool of collective cultural imagination. Both shifts become more conclusive, more definitive, as the turn of the twentieth century approaches and I account for the impact of these shifts on the literary imagination of the postbellum decades. Karen Barad might suggest a study of the diffraction pattern of the ripples, to register the intra-action of postbellum thought.³⁹ Like Barad, I’m not

³⁸ I will stop short of suggesting that Wootton’s “meta-scientific tools and concepts” and Roemer’s “perceptual tools” are, from the standpoint of one commenting on human cognition and meaning-marking, fundamentally the same. Though this would go a long way toward proving (or attempting to prove) my previous conviction that literature and science work on the same thing, it is more of a theoretical/speculative tangent than I currently want to pursue.

³⁹ See Barad, Karen. *Meeting the Universe Halfway*. Barad contrasts “diffractive” and “reflexive” methodologies, most importantly inasmuch as the former “is respectful of the entanglement of ideas and other materials in ways that reflexive methodologies are not” (29). Also, “diffraction does not fix what is the object and what is the subject in advance, and so, unlike methods of reading one text or set of ideas against another where one set serves as a fixed frame of reference, diffraction involves reading insights through one another in ways that help illuminate differences

interested in sharply defining boundaries between an inside and an outside of either literature or science—or speculation, the focal concept of my study. I’ve chosen this focal point to investigate what familiar figures and surprising phenomena involve themselves in negotiations of speculation’s meaning and value through their implicit and explicit beliefs-in-science. The way to attend to gradualism, descriptionism, and other concepts whose non-linear movements through “science,” “society,” “cultural,” and “postbellum American literature” shape the period’s beliefs-in-science is to render permeable and hypothetical the boundedness of entities which are conventionally assumed to pre-exist the inquiry (entities like “science,” “society,” “postbellum American culture/literature”).

While “gradualism,” for example, might be a thesis of a work of geology, it is also—as in Mark Twain and Charles Dudley Warner’s *The Gilded Age*—a crucial element in an unfolding social drama that overlaps pure scientific discovery. Chapter two, “Speculation, Extraction, and Polytechnical Education in *The Gilded Age*,” reads Twain and Warner’s 1873 novel, *The Gilded Age*, as a critique of the role played by speculation in the “culture of extraction” that arises from the gold and silver rushes of the 1850s and 60s. The belief-in-science valorized as a prospective status quo and illustrated by Twain and Warner’s novel, *The Gilded Age*, judges the application of organized, professional, systemic science to be conducive to a healthy culture of extraction—a culture in which producing value (whether cash or truth) requires careful excavation of the substantial as opposed to speculation upon the superficial. I use *The Gilded Age* to document

as they emerge: how different differences get made, what gets excluded and how those exclusions matter" (30). The postulates of this diffractive method are a renewed conviction in the ontological primacy of phenomena over "independent objects with independently determinate boundaries and properties. While we conceive of objects as interacting, we must conceive of phenomena as intra-acting. In an interaction agencies are separate and defined beforehand; intra-action on the other hand is the very emergence of distinct agencies. In Barad's words: "agencies are only distinct in relation to their mutual entanglement" (33). Following from these reconceptions, Barad similarly redefines realism as "not about representations of an independent reality but about the real consequences, interventions, creative possibilities, and responsibilities of intra-acting within and as part of the world" (37).

historian Kent A. Curtis's conclusion that the uncertain, chaotic nature of the formative gold and silver mining periods "mapped and shaped the ethos of an entire region and eventually of the nation" by producing knowledge and expertise in mineralogy, engineering, geography and geology. This chapter on the largely undiscussed geological concerns of Twain, Warner, and a host of others in the decades following the Civil War shows how writers, readers, and thinkers of the day know that scientific issues are not discrete from the social, economic, and literary phenomena which reference them.

A new scientific accomplishment does not join the political sphere as a newly-elected congressman enters the capitol. A novel is more than an index of the topical—no matter how many critics argue the contrary.⁴⁰ Chapter three, "Demarcation Problems: Speculation, Extrapolation, and Pseudo/science in the Works of Ignatius Donnelly," elaborates these propositions by introducing Ignatius Donnelly's varied oeuvre and exploring how otherwise erroneous texts can have literary value as documents of speculation and its relationship to science. I argue that not only those who are scientifically "correct" impact the mutual shaping of the literary and scientific imagination, reading as a proponent of science-driven speculation, rather than a pseudo-scientist aspiring to speculation-driven science. Donnelly's writing on geological topics, such as the lost continent of Atlantis, a prehistorical meteor impact, or a catastrophic uprising of the world's underclasses urges his readers to reimagine humanity's place in space and time.

⁴⁰ Louis J. Budd judges that "the topical criticisms in [*The Gilded Age*], when extrapolated into precepts, exacerbated an ahistorical myopia that saw a sudden flabbiness of moral fiber—reversible by a willing conscience—rather than a massive, qualitative shift in economic patterns and power. More narrowly, by focusing on corruption, [the novel] encouraged a cynicism about office-holding" (xvii). Bryant Morey French's book-length study of the novel, *Mark Twain and The Gilded Age: The Book That Named an Era*, largely treats the novel as a topical *roman à clef*.

While Donnelly's confrontation of an emergent status quo is flagrant, the subtle confrontations of other canonical authors and texts have gone relatively unnoticed—often precisely due to their canonization under the heading of other *topoi*. Chapter four, “The Value of an Individual: Sarah Orne Jewett as Statistician,” argues that Jewett's fiction—and by extension much regionalism—can be read as responding to the advent of statistical mathematics in the social sciences by doing another kind of statistical description, rather than rejecting the impetus of statistics outright. While professional and popular publications alike debate the techniques and concepts underpinning the fledgling social sciences—rounding off more than a century of exchange between scientists and bureaucrats concerning statistical mathematics—Sarah Orne Jewett imagines doctor colleagues debating the experimental value of raising a female ward to be a doctor (in *A Country Doctor*) and sends off somewhat ethnologically-minded Bostonians to live among the rural tribes of New England (in *Deephaven* and *The Country of the Pointed Furs*). Chapter four reads Jewett as deeply involved in the emergence of a new, scientifically-inflected way of thinking about social life. Jewett's affinities lie with the qualitative descriptions of German *statistik* that were, over the course of the eighteenth and nineteenth centuries replaced by the practice of counting populations and events to generate probabilistic calculations and actuarial tables. Moving from her earliest writing to her superlative treatment of the individual as document in *A Country Doctor*, I identify Jewett's extended meditation on the interaction between curious, remarkable characters and the knowledge they impart about the social. Jewett might be said to accept the gradualist *ethos* of statistical measurement without accepting its mathematical methods, thereby touching upon but departing from both the gradualist belief-in-science of *The Gilded Age* and the extrapolative (but catastrophist) belief-in-science of Donnelly.

Jewett's belief in science could be identified as gradualist extrapolation, as her fiction imagines how life *will continue to unfold* for denizens of a particular region, given what is known about the recent course of American (and transatlantic) social life. Another group of thinkers, however, responded with equal dissatisfaction toward such gradualist extrapolation and social description that proceeds by aggregation and abstraction—the pioneering thinkers of intersectional feminism. These thinkers, like Francis Ellen Watkins Harper, Anna Julia Cooper, and Victoria Earle Matthews, were skeptical of the silencing, pacifying conclusions of sociological prescriptions of the (gradual, calculable) inevitability of racial uplift. In chapter five, “‘Speculation Has Exhausted Itself’: Iola Leroy, Social Con/science, and Racial Uplift,” I contrast the well-studied sentimentalism of Francis Ellen Watkins Harper's historical romance, *Iola Leroy*, to ethnologies by Alexander Crummell, William Wells Brown, and George Washington Williams. Finding in *Iola* a palpable ambivalence toward the scientific methodologies of these authors, I argue that Harper's narrative envisions a Christian humanism that champions affective certitude over scientific/propositional truth, making individual experience the arbiter of sociological description rather than the other way around.

Each chapter studies a different angle of “speculation” and its heterogeneous relationship to scientific and literary production and though I don't construct an exact chiasmus, it is a figure that helps describe the larger moves of the dissertation's structure. While the first two chapters examine earth sciences and the second two chapters encounter social sciences, the social implications of geo-science transition to the geo-significance of social science. In each half of the dissertation, one chapter examines an array of texts by multiple authors while the other hews closer to single-author study, looking at an array of texts from single authors. These focuses also underscore different epistemic conflicts: the conflict between catastrophism and uniformity in

chapters two and three and the conflict of quantitative versus qualitative description in chapters four and five, which implies a further conflict between social “fact” and individual “value” (which Harper translates to something like social value and individual fact).

At the same time as these chiasmic forms obtain, an arc of argument concerning speculation stretches across the four chapters. Chapter 1 represents what will become the status quo view, in which speculation must be tightly controlled by exact, bureaucratic, professional science. Chapter 2 reactivates speculation as the liberty, pleasure, and even political promise to be derived from scientific discovery. Chapter 3 and 4 register different motives for dissent against social-scientism (and hence both professional science and speculative thought) on behalf of what we today might (problematically) call humanism. While science becomes a more or less unassailable civic entity, represented by a collective of disciplined professions (and professionalized disciplines), speculation becomes a kind of cognitive mood that always risks distorting the way things “really are.” As will become clear below, and as the arguments specific to each chapter unfold, I am less motivated by *theorizing* a change or development than I am by describing the cacophonous imaginative landscape of an era. Yet I do attempt to do both (theorize and describe—and neither of these claims to *demonstrate*), mainly in order to preserve the irony that my own scholarship is marked by the supposed need to decide between theory and description, between cataclysmic intervention and gradual development, that I argue is the invention of the era I study.

Beyond a study of a period, my dissertation prepares a greater revisionary work at the level of humanistic inquiry. Inspired by Karen Barad, my study limns “science,” “writing,” “literature,” and “fiction” from out of a phenomenon, “speculation,” rather than the other way around. In Barad’s theory of agential realism, well-defined, bounded individual agents do not

pre-exist an *interaction*, instead an apparatus must be brought to bear on a phenomenon in order to cut such boundaries and designate the agents of an *intra-action*. To simplify: the phenomenon is taken to be ontologically prior to the entities that are apprehended through the study and explanation of said phenomenon. Like Barad argues of meaning and matter generally, I argue specifically of this situation: works of science and literature do not pre-exist, bounded and uninvolved with one another, a controversial coming-together. Rather, a much larger, cloudier, indeterminate sociocultural phenomenon is taking place in which the identities of science and literature *begin to matter*, as Barad would say. In this way, my study seeks to be useful to rethinking and reorganizing humanist academic spaces. Approaching meaning-making through such theory has a pragmatic counterpart: with American literary criticism as a strategic touchstone, my work addresses what Mario Biagioli calls “postdisciplinary liaisons” between the humanities and sciences.⁴¹ To rethink and reorganize humanist academic spaces, as encouraged by Biagioli and scholars like him, I begin with a literary and cultural history of the crossing paths of literature and science at a time when these spaces were first being organized.

Filling in the history of meaning-making textual practices which undergirds such institutional movement contributes to contemporary cultural studies of science and critical theory

⁴¹ In “Postdisciplinary Liaisons: Science Studies and the Humanities,” Biagioli makes “a case for a stronger alliance between the humanities and science studies—one that could develop better tools for understanding the practices of the sciences while enhancing the relevance and visibility of the humanities” (817). Central to this alliance, he argues, will be a reconsideration—if not reorganization—of how humanist academic spaces of inquiry are organized. This would likely include imitation of a habit of the sciences, which “produce cross-disciplinarity *within groups*, not individuals, by bringing differently specialized researchers together around a problem. In these scenarios, the keyword is collaboration (not discipline or field), with each collaboration potentially instantiating a different and temporary cross-disciplinary setup” (820). Such practices in the sciences have “expanded the meaning of novelty”—which expanded meaning the humanities might explore: “science-studies practitioners may think of the new in terms of a novel reading of known sources or an unknown cache of manuscripts. But, in addition to that, they also encounter the new in terms of emergent objects and practices brought about by the development of the technosciences themselves” (820). Hence, in science studies, “emergence (and related concepts such as the temporality or ‘historicality’ of things) is coming to assume a role comparable to that of the canon in other humanistic disciplines” (821). Hence, cross- or inter-disciplinarity becomes working method and/or product rather than an identity or institution.

more generally—specifically debate about the Anthropocene.⁴² My study points the way toward alternative critical narratives of the Anthropocene. As Christophe Bonneuil and Jean-Baptiste Fressoz remind us in *The Shock of the Anthropocene*, the humanistic narrative emerging from contemporary scientific treatment of the Anthropocene remains negotiable. Emphasizing geological and sociological thought in US literature, I pursue alternatives to the narrative of “awakening,” in which we “moderns” only realize our geo-social folly once it is “too late.” The writings of Ignatius Donnelly, along with Twain and Warner’s *The Gilded Age*, point to an enlarged social awareness of earth sciences and their applications, anticipating the conflicts of commodification and bureaucratization of science. Similarly, Harper’s *Iola Leroy* and Jewett’s *A Country Doctor* confront the literally geo-logical figurations implied in the rise of social science, each in her own way resisting the qualitative and affective flattening that accompanies the quantitative deepening of social description. These two vectors of scientifically inflected thought will meet time and again at the turn of the twentieth century and thereafter, whether in the literature of the mainstream or in the increasingly prolific genre of science fiction. Frank Norris, in both *The Octopus* (1901) and *The Pit* (1903), will depict the geo-economic flow of “the wheat” both literally and figuratively drowning individual humans in a struggle between social collectives, corporations, and the wheat itself. Willa Cather, in *The Professor’s House* (1925), and Sinclair Lewis, in *Arrowsmith* (1925), will variously explore the scientist’s role in consumerist capitalism and the geosocial consequences that follow. In the literature after the

⁴² My intuition—and that is all I have at the moment—is that the twentieth century outcome of the nineteenth century process I describe in the following chapters is a thorough alienation of speculation and science in the public mind. A seemingly unassailable border stands between science and science fiction, such that films like those of Roland Emmerich (*The Day After Tomorrow*, 2012) can be treated as pure entertainment while otherwise reasonable people remain agnostic toward—or heartily deny—global climate change. It is possible, that is, that the proponents of geological gradualism didn’t know their own strength, and convinced the public so thoroughly that slow, rhythmic, predictable change is the truth of the universe that any kind of catastrophe becomes mere fantasy. And fantasy is fun—not serious science.

World Wars, the examples are too numerous to even mention, ranging in style and niche from Kurt Vonnegut's *Cat's Cradle* (1963) or Thomas Pynchon's *V.* (1963) to Karen Tei Yamashita's *Through the Arc of the Rainforest* (1990) and Ann Patchett's *State of Wonder* (2011).⁴³ The following work is the first chapter in a new story of the encounters between science, speculation, and literary imagination which remains strategically dissatisfied with any conviction that imaginative literature comes to science late and then only to engage Darwin and evolution, Einstein and relativity, or Crutzen and the Anthropocene—the celebrities and their breakthroughs.

⁴³ Again, this is to say nothing of science fiction, which, from the first appearance of Verne's *From the Earth to the Moon* in an American weekly in 1867 to Neal Stephenson's recent imagination of the explosion of the moon in *Seveneves* (2015), has been nothing if not "geosocial"—even in its most retrograde Edgar Rice Burroughsian incarnations.

2. Speculation, Extraction, and Polytechnical Education in *The Gilded Age*

When Philip Sterling protests that he is not, in fact, an engineer, his friend Henry Brierly dismisses the objection to their chosen get-rich-quick scheme: “You can begin by carrying a rod, and putting down the figures. It’s easy enough. I’ll show you about that. We’ll get Trautwine and some of those books” (91). My interest in this novel, Mark Twain and Charles Dudley Warner’s *The Gilded Age*, begins with this laconic invocation of “Trautwine,” foregrounding the flurry of scientific activity involving engineering, mining, mineralogy, and geology from the 1850s—to the mid-1870s. Louis J. Budd holds that Henry here refers to *The Civil Engineer’s Pocket Book* by John Cresson Trautwine, a 750-page compendium published in 1872, but since Charles Dudley Warner’s tenure as an engineer was in the mid-1850s, I find the need to further scrutinize this quip to effect a stronger representation of the emerging technocratic belief-in-science, and the social tensions related to its emergence, that Twain and Warner explore in their co-written novel. (Twain and Warner 467n41).

Perhaps Twain and Warner only became aware of Trautwine through his 1872 book around the time they began composing their novel in 1873. If so, referencing it in this exchange would be a clear anachronism—whether intentional or simply a matter of no consequence to the authors—since Henry and Philip have this conversation before the outbreak of the Civil War. However, Trautwine also published two books in 1851, both of them less compendious, either of which could have been used by Warner, who was doing relevant engineering work at the time. These books—*The Field Practice of Laying out Circular Curves for Railroads* and *A New Method of Calculating the Cubic Contents of Excavations and Embankments, by the Aid of Diagrams*—came in at around 100 pages and 200 pages, respectively—much easier to carry for a

dilettante like Harry.¹ Which Trautwine text is intended by the authors is a question of twenty years² and, significantly, the first two books predate the discovery of the Comstock Lode while the publication of *The Civil Engineer's Pocketbook* would have been more topical, coinciding with a wave of writing from publicly-engaged scientists. The twenty-year, pre- and post-Comstock gap between Trautwine's books can also stand as a marker of a similar gap between Twain and Warner themselves. Warner's engineering experience was with the railroad (again: pre-Comstock) whereas Twain's comparable experience was with precious metal prospecting and mining engineering in the post-Comstock days of the Nevada Territory. In short, Warner and Twain's dabbling in the applied sciences, like Trautwine's manuals, bookend a stretch of history in which countless geologists, mineralogists, mining engineers, surveyors, and pundits argue about the need for professionalization of mineral extraction.

So much scholarly effort has gone into chasing down the topical referents of the book's "political" content,³ but this allusion and Sellers's comparable invocation of Louis Guillaume Figuiet ("Count Fugier") ought to be of equal interest, since Sellers' belief-in-science is the

¹ "Nobody dressed more like an engineer than Mr. Henry Brierly. The completeness of his appointments was the envy of the corps, and the gay fellow himself was the admiration of the camp servants, axemen, teamsters and cooks," we read in the same passage in which we learn that "there was not a great deal of scientific knowledge in the entire corps, nor was very much needed," since "the chief object of a preliminary survey was to get up an excitement about the road, to interest every town in that part of the state in it, under the belief that the road would run through it, and to get the aid of every planter upon the prospect that a station would be on his land" (123-124)

² A word on the complicated historical framing of the novel might be needed here. Often treated as satirizing the immediate post-Civil War years, *The Gilded Age* actually spans a period of at least 20 years, the story beginning well before the Civil War. Some evidence might even suggest that Twain and Warner hoped the novel to remain popular through the end of the nineteenth century, as the authors obscure specific dates, e.g. "18—," and in one chapter they clarify to the reader, when speaking of *Godey's Lady's Book*, that "we are writing of a by gone age—some twenty or thirty years ago" (40).

³ I've already cited Budd's edition of *The Gilded Age*. Bryant Morey French pursues such annotations as the principal method of his *Mark Twain and the Gilded Age: the Book That Named an Era*. Several journal articles have a similar approach, such as John E. Bassett's "The Gilded Age: Performance, Power, and Authority," Da Zheng's "Twain and Warner's *The Gilded Age*: The Economy of Insanity," and Nathan Wolff's "Emotional Insanity, Cynical Reason, and the Gilded Age." The latter two investigate, in Wolff's words, the "scathing critique of American political emotion" Twain performs "by declaring war on the emergent legal capacity to mount an insanity defense—a symptom in Twain's reckoning, of an overly sentimental public and legal system" (174).

opposite number to that of Philip Sterling. Beriah Sellers, the novel's celebrated buffoon and/or con artist (it is never settled which he really is), often treats scientific talk as a very powerful kind of magic, or, as we might call it today, following Harry G. Frankfurt, bullshit.⁴ Presenting the lack of heat in his home as an innovation, Sellers says to a visitor:

I have been reading up some European Scientific reports—friend of mine, Count Fugier, sent them to me—sends me all sorts of things from Paris—he thinks the world of me, Fugier does. Well, I saw that the Academy of France had been testing the properties of heat, and they came to the conclusion that it was a nonconductor or something like that, and of course its influence must necessarily be deadly in nervous organizations with excitable temperaments, especially where there is any tendency toward rheumatic affections. Bless you I saw in a moment what was the matter with us, and says I, out goes your fires!—no more slow torture and certain death for me, sir. What you want is the appearance of heat, not the heat itself—that's the idea. (57)

Keen readers will see, by the context in which it appears, that the semblance of scientific reasoning advances a speculative hypothesis that the appearance of heat is healthier than heat itself, which has the benefit of sidestepping a harsher pecuniary reality—that Sellers can't afford coal to warm his family home. If readers don't see the immediate comedy of the situation, they might still recognize the name Louis Guillaume Figuier (1819-1894) in "Count Fugier." Figuier was well known in the second half of the 19th century as a popularizer of scientific research. His

⁴ I refer here to that landmark of using profanity in academic writing, "On Bullshit," first published in *Raritan Quarterly Review* 6.2 (Fall 1986) and eventually published in book form, as *On Bullshit*, by Princeton UP (2005). In Frankfurt's view, a bull-shitter attempts persuasion with total indifference toward truth, in contrast to a liar, who shows concern for the truth by attempting to hide it. As I mention later, it is difficult to decide, of Beriah Sellers, whether his attunement to truth is fundamentally that of delusion or cynicism; perhaps his family name is indictment enough.

yearbook, *L'année scientifique et industrielle*⁵, was published annually from 1857 to 1914, continuing its run for twenty years after his death.⁶ When Sellers says that Count Fugier sends him scientific reports, I would argue this is a wink to the reader: Count Fugier only sent them in the same way that he sent them to all his other subscribers. Sellers might as well claim, with the latest number of the *Atlantic Monthly* in hand, that his friend William Dean Howells sends him all the newest in Anglo-American letters.

Taken together, these two allusions in *The Gilded Age* evoke a scientific valence to the social and political controversies satirized by the novel. Commentary elsewhere on the waning of the Comstock Lode further suggests how mineral extraction serves as a nexus point for the literary, scientific, educational, and political concerns handled by the novel. Around 1870 decreasing output from the Comstock Lode became a cause for alarm among miners, businessmen, and political pundits. An unsigned review of Clarence King's *Report of the Geological Exploration of the Fortieth Parallel* (likely written by Henry Adams, then editor of the *North American Review*) complains that a commission charged with examining the viability of the massive silver deposit "does not include among its three members a single mining engineer or geologist" despite the congressional resolution specifically calling for one ("King's Geology Survey" 209). Mark Twain and Charles Dudley Warner have a few more choice words to say on this topic—but so does geologist Josiah Whitney, who cuts straight to the heart of their so-called Gilded Age when he writes, "Metal mining is proverbially uncertain, and in proportion

⁵ The full title was *L'année scientifique et industrielle, ou Exposé annuel des travaux scientifiques, des inventions et des principales applications de la science à l'industrie et aux arts, qui ont attiré l'attention publique en France et à l'étranger* (Yearbook of Science and Industry, or Annual Digest of Scientific Work, Invention, and Application of Science to Industry and the Arts Which Have Attracted Public Attention in France and Abroad).

⁶ Other celebrated works by Figuier include *La terre avant le deluge* (1863), *The Vegetable World* (1867), *The Ocean World* (1868), *The Insect World* (1868), *Reptiles and Birds* (1869), *Primitive Man* (1871), and *The Human Race* (1872).

as it is uncertain, so it is attractive” (276). Echoing Whitney and the *NAR* reviewer in the London preface to *The Gilded Age*, Twain identifies political corruption as “one sad feature” of the novel’s larger theme. “In America,” Twain writes, “nearly every man has his dream, his pet scheme, whereby he is to advance himself socially or pecuniarily. It is this all-pervading speculativeness which we have tried to illustrate” (451). This preface, authored by Twain alone, is direct, even sober, in its pronouncements on the theme of the novel—perhaps because Twain was speculating on his international reputation without the oversight of his more experienced coauthor, Charles Dudley Warner.⁷ Capturing an important mid-nineteenth-century struggle over the meaning of science, this narrative about “speculativeness” suggests the business of mineral wealth as that which explains the culture of speculation, fantasy, and graft satirized by the novel and maligned in the pages of periodicals, from *The North America Review* to the *Overland Monthly*.

A tension between superficial speculation and productive labor structures the novel, as illustrated in the Harry Brierly-Philip Sterling dyad. After a period of unremunerative work as railroad engineers, Philip and Harry head back east. Philip, not “satisfied with his western prospects” or the “large but rather indefinite promises” of railroad contractors, despairs of “opportunities for a fortune he did not doubt existed in Missouri” and concludes that his livelihood will depend on “the mastery of the profession he had rather thoughtlessly entered upon,” that is, engineering. He has already shown promise in this field, and “contractors called him into their consultations frequently,” relying on his expertise “as to the character of the country he had been over, and the cost of constructing the road.” But Philip recognizes “that if he was going to make either reputation or money as an engineer, he had a great deal of hard study

⁷ See Henrickson for a discussion of Twain’s trip abroad to oversee the novel’s British publication.

before him.” The narrator tips off the reader as to the important contrast between Philip and Harry by adding that “it is to [Philip’s] credit that he did not shrink from” this “hard study.” This passage offers the central comedy of the novel in miniature: while so many Harries are “dancing attendance” in Washington, hoping to benefit from the “indefinite promises” of politicians and financiers, too few Philips set out to master a profession, let alone a scientific one (169-170). Harry, like Silas Hawkins with his Tennessee land, speculates that value is out there and plans to hang on until it appears; Philip learns how to get at it through professionalization.

This novel featuring such a clearly defined dyad, a happy ending precipitated by a nick-of-time coal strike, and a central intrigue involving a proposal to found a polytechnical university has yet to lead scholars to a sustained treatment of its technical and scientific preoccupations—an oversight itself harmonious with the satire.⁸ Aside from a few reassessments and explications

⁸ Though studies of Twain's participation in the nineteenth century cultures of science are no new topic, most work on this theme goes to seemingly more readymade Twain texts—both earlier and later than *The Gilded Age*. Judith Yaross Lee, in "(Pseudo-)Scientific Humor," details early Twain, and a genre of science satire writing that predates him. Beverley Hume looks at Twain's (skeptical) attitude toward scientific truth at the end of his career in "Twain's Satire on Scientists: Three Thousand Years Among the Microbes." Scholarship on technoscience in *A Connecticut Yankee in King Arthur's Court* is, of course, too abundant to list here. Recently Lawrence Howe and John Beckman have refreshed Twain's relevance as an early realist author specifically through his adventures with applied sciences. Following the theories of Bruno Latour, Beckman argues that Twain and Howells "both explicitly and inadvertently, employing a variety of genres and meta-fictional techniques...present a literary record of" an "epistemological class struggle" for access to purified fact (28). Howe revisits a key chapter of *Roughing It* which recounts the episode of the blind lead, involving speculation, imagined riches, and a passing reference to Twain's "share of the family land in Tennessee"—a biographical element of Samuel Clemens's life "which Twain will deploy as a crucial plot element in *The Gilded Age*" (5). This is not just a matter of biographical interest for Howe, though the blind lead/Tennessee land business does "contribut[e] to a narrative pattern that Twain deployed over his career" (5). The episode (and by extension, the narrative logic of *The Gilded Age*) "denotes a shift in forms of property ownership—from ownership of land in Tennessee to contract rights for mining valuable ore in the Comstock Lode. This shift reflects the ways in which the concept of property in nineteenth-century America was being reimagined" (5). This is certainly a matter of historical interest, but for Howe it is also significant in understanding "Twain" as an emerging piece of *intellectual property*: "the text goes further to illuminate how Twain himself converted personal misfortunes with respect to different forms of property ownership into literary success, which delivered the twin rewards of money and cultural capital" (5). These studies suggest, by their relative omission of *The Gilded Age*, that much work remains mutual contextualization of nineteenth century science and literature in the US, especially since re-periodizations of nineteenth century US literature, as strongly advocated by Christopher Hager and Cody Marrs among others, stand to benefit from closer attention to the conflicts and disagreements over the very meanings and values assigned to science across the century. Hager and Marrs, in "Against 1865: Reperiodizing the Nineteenth Century," make their case based on the problematic resolution of the liminal position of certain key authors—Whitman, Melville, Stowe—vis-à-vis the supposedly epochal 1865 break. Charles Dudley Warner might be placed

over the last twenty years or so, *The Gilded Age* now exists mostly as the namesake of its historical period.⁹ Scholars, in this case, repeat the intellectual habit, impugned by historian Kent A. Curtis, by which Americans often “make sense of their complicated material world [with] a

in these ranks—his *My Summer in a Garden* (1871) points back to works like Holmes’s *Autocrat at the Breakfast Table* (1857), but such is not my present occupation.

⁹ The “reassessments” have, for the most part, already been named in note 44, above. As for the widespread commonplace of *The Gilded Age* as the forgettable text that names an era, examples abound in literary and historical scholarship alike. Calhoun, Charles W Calhoun in his "Introduction" to *The Gilded Age: Essays on the Origins of Modern America* notes that “the term ‘Gilded Age’ derives from the title of a novel published in 1873 by Mark Twain and Charles Dudley Warner” of mainly malignant impact on “historical truth:” “scholars for decades tended to view Twain and Warner’s gross caricature as an accurate, if somewhat overdrawn, portrait of late nineteenth-century American life” (xi). To invoke the novel’s title in this way is common practice for historians, repeated by Sean Dennis Cashman in *American in the Gilded Age: From the Death of Lincoln to the Rise of Theodore Roosevelt*, among others. After an overture illustrating the Gilded Age as “the heyday of the robber baron” (1-2), Cashman turns to the “censorious tribute to the aspirations, autocracy, and affluence of the new American plutocracy of industrialists, financiers, and politicians in [Twain’s] utopian satire, *The Gilded Age*” (3). Cashman notes that “Twain’s epithet, approved by his collaborator [not coauthor, for some reason], Charles Dudley Warner, has survived as the most apt description of the period” (3). Like Cashman and Calhoun before her, Rebecca Edwards mentions *The Gilded Age* briefly, in her *New Spirits: Americans in the Gilded Age, 1865-1905*, as a novel that “satirized get-rich-quick schemes and corruption in Washington” and lent its name to the period. She quotes from Twain’s notes for the novel, citing his conviction that “gold rushes and railroad speculation” were major disasters of the era. See Edwards, Rebecca. Alan Trachtenberg namechecks *The Gilded Age* twice in *The Incorporation of America* but does so in lieu of a gloss, as a synecdoche of Twain’s attitude toward his times (150; 162). A recent literary study, having many of its own merits, unfortunately makes no mention of Twain and Warner’s novel despite bearing the subtitle “Mining and Writing in the Gilded Age.” In *Claims and Speculations: Mining and Writing in The Gilded Age*, Janet Floyd writes that “throughout the late nineteenth century, gold and silver mines, mining, and miners generated a mass of expressive material. The miners, amateur and experienced, who followed the strikes and rushes of the period did not wait for professional writers to undertake the task of evoking their experience. [...] Indeed, most of the representation of gold and silver mining during this period was the work of people who were drawing on a range of engagements with the industry” (3). Such anticipates my argument. She finds that “mining and its representation were tightly entwined”—another observation crucial to my own argument (3). She even criticizes a “paucity of scholarly interest” that has rendered “the dynamic, diverse response made by a range of writers obscure” (8) Floyd wants to retrieve these “varying reactions to industrialism, their engagements with modernity, and their readings of their locations of the strikes deserve to be enfolded in the literary history of the period” since “this is a time, after all, that we frequently name by reference to precious metals and their troubling cultural impact: the Gilded Age” (8-9). Likewise, the only hint of the novel I was able to find in recent anthologies of American Literature was in the introduction to the 2014 *Heath Anthology of American Literature, Vol C.* where we read that

The period from the 1870s to the 1890s was marked by corruption--bribery, graft, vote- and office-selling, the spoils system—at every government level, from the federal administration and Congress to the local city ward politician. “The Gilded Age,” Mark Twain called it, capturing in the novel of that title (cowritten with Charles Dudley Warner in 1873) its fever of unrestrained speculation and get-rich-quick schemes, its glitter and fraudulence. (Lauter 7)

Ruland and Bradbury similarly make brief mention of the book in their history of American literature, *From Puritanism to Postmodernism*, as one that “portrays the age as a great gold rush where land and city alike are packed with fortune hunters” (197).

material shortsightedness, an incomplete knowledge about the natural context of a minerals-based society.” In short, we all too readily forget “that we are fundamentally a mining nation” (4). I take a step toward remembering by restoring mining and mineral wealth as that which explains the culture of extraction that motivates the speculation, fantasy, and graft satirized by the novel. It is this culture of extraction that goes hand in hand with the gilding of the novel’s title: “gilding” signifies that value *puts in an appearance*, though *mere superficial appearance* will suffice to mobilize speculation, whether financial, scientific-industrial, or political.

Restoring *The Gilded Age* to its scientific context recommends a fresh look at key moments from its co-authors’ earlier publications, as both had experiences with engineers and prospectors during the westward expansion of the 1850s and 1860s. The contrasting (if not contesting) ideas about science and speculation informing Twain and Warner’s writings also appear in a lively debate over how best to handle the nation’s mineral wealth appearing in various periodicals in the years before and after the publication of the novel. From the pages of *The North America Review* to *Overland Monthly*, scientists, educators, and literati like Josiah Whitney, John A. Church, and Henry Adams deplored the haphazard extraction of and speculation upon the wealth of what Curtis calls “the US mining west.”

As Twain himself suggests in his London preface, the two authors do not write to dismiss speculative habits out of hand. Rather, in their survey of the eponymous gilded age, they cannot but take note of *what kind* of speculation actually works—and further to what notion of science this speculative habit is best attached. The novel catalogues a range of belief-in-science: science as rhetorical device, science as handmaiden to technology, commodity, and profit, and, finally, science as a calling that has its own intrinsic value. The narrative lionizes this last attitude and recommends it as the one most productively matched with the American speculative habit. In

The Gilded Age, speculators often have scientific pretensions but only applied science *knows* or *discovers*, rather than speculates, and thus wins the day. The very fact that we can easily recognize Philip as a better scientist or technician than Sellers only goes to underscore the triumph of a certain kind of scientific practice. Speculative thought is by definition impractical and therefore *risky*. The culture of extraction begins with the superficial implementation of scientific, technological, political, and/or financial means to take advantage of this appearance of value, often being misdirected by *mere* appearance, superficial appearance that lacks substance. The culture of extraction must undergo a kind of reversal to become practical: pioneered through risk, speculation, and rumor, mineral extraction adopts a systematic, deliberative, geological and geographical focus in order to better extract—or, in other words, to *minimize risk*, whereas the speculators—the former risk takers who continue to do so—are driven to the edges of the narrative, if not the edges of society: Harry to the Pacific, Sellers in limbo in Washington, Laura in her disastrous speaking career and subsequent death.

Careful description of the culture of extraction must precede the critique one might be itching to perform, especially given the resonance of “culture of extraction” with the Marxian phrase, “extraction of surplus value.”¹⁰ As today’s interdisciplinary debates about ecology,

¹⁰ For an immanent opportunity to critique *The Gilded Age* on these grounds, see Andreas Malm’s *Fossil Capital*. Malm’s central argument is that “the fossil economy”—his coinage—is the rightful “object of interest” for those interested in climate change; and, moreover, this fossil economy was driven by, if not invented by, the nascent form “capitalism,” rather than the other way around (4). Conventional stories hold that a more or less accidental—but somehow necessary—switch to fossil fuel drove the birth and growth of capitalism. Malm writes, rather poetically, in the spirit of Marx:

Now is the time to turn over a thousand stones, to unearth the climatic implications of innumerable actions—not merely because the smallest puff of smoke in Manchester in 1842 released a quantity of CO₂ which then lingered in the atmosphere, playing a microscopic part in the creation of the current climate, but also, and more importantly, because the fossil economy was established, entrenched and expanded in the process. It is as though a novel dimension has been suddenly revealed in modern history. Just think, in this light, of the building of the railway networks, the construction of the Suez Canal, the introduction of electricity, the discovery of oil in the Middle East, the rise of suburbia, the CIA coup against Mohammad Mossadeq, the opening of the Chinese economy by Deng Xiaoping, the American invasion of Iraq...as a series of moments in the historic totality of the fossil economy—deepening its channels, adding ever-

politics, and the meaning and periodization of the Anthropocene suggest, we need a wider and deeper narrative. All this goes to further recommend *The Gilded Age* as more of a prototypical realist novel than has, perhaps, been accepted so far. While the authors joke, in the American preface, that they intend to “take in the whole world,” they do indeed succeed in examining a considerable swathe of American society with attention to the lived experience of everyday people in social space (5). Moreover, the novel has a fairly clear view of the complexity of social life, as it examines how movements big and small in fashion, culture, economics, and politics—as in the misfit book-buying chapter. Laura, killing time as she waits to confront a politician on his way out of a meeting, steps into a bookstore and attempts to purchase a new English translation of Hippolyte Taine’s most recent work. This work is linked with that of William Dean Howells as Laura proceeds to lecture the bookseller in the difference between literary taste and the kind of consumerist hard selling he is attempting (he never brings her the books she asks for, but rather the ones he intends to sell her. Laura, on her way to extract political favor from a congressman—and this to better extract value from the Tennessee land—is aghast when the bookseller rather obviously tries to extract money from her without concern for anything but the superficialities of the transaction. Laura’s concern over literary taste rhymes with Philip Sterling’s sense that coal can only be extracted from the Ilium mine with the proper application of science—and this is exactly the point that makes the culture of extraction so important to the study of literary history during the rise of realism. An intimate connection obtains between matters of print, matters of education, and matters of mineral extraction. Discipline, taste, and tact in the first two, many luminaries hold, will root out detrimental speculation in the last.

greater volumes of fossil fuels to the fire—these events are retroactively suffused with a new significance, calling for a return to history, eyes wide open. (5)

Or, in a classically compact Marxist chiasmus:

Here it is a matter of searching not for climate in history, but for history in climate. (6)

Promoting such a formula *The Gilded Age* postulates a status quo, providing the baseline against which the dynamic, yet subtle, divergences traced in my subsequent chapters emerge.

Critiquing the Rush for Minerals

Several historians reject overly-simple narratives of Gold and Silver “rushes” as obscuring the longer, more complex story of mineral extraction and speculation witnessed firsthand and lampooned by Mark Twain and Charles Dudley Warner, whose waxing and waning fortunes are tied up in the peculiar ways American fortune seekers and industrialists set out to extract mineral value. Many historians, Kent A. Curtis, Jeffrey J. Safford, and Clark C. Spence among them, have noted the inadequacy of the popular narrative of an 1849 gold rush driving westward expansion. Spence even compares the superficiality of historians’ gold-fever to that of the prospectors themselves. In the preface to *Mining Engineers and the American West*, Spence provocatively compares historians to gold prospectors:

For years prospectors toiled away in the valley of the Carson under the shadow of Mt. Davidson, gaining a modest amount of gold, but sweating and cursing as they cast aside the “damned blue stuff” that clogged their primitive equipment. Finally in 1859, when assays were run, this “damned blue stuff” proved to be worth nearly \$5,000 per ton in silver—and the rush was on. In like fashion, the historian has traditionally been preoccupied with working the ground where gold obviously glittered and until recent years has ignored the unfamiliar, more complex metal deposits. [...] Emphasis has too often been on the color and drama of the mining frontiers, rather than on the more prosaic but equally important mineral industry. In part, this has been a function of the Turnerian focus on the pre-1890 era; in part, it has been an outgrowth of the pragmatic belief that

glamorous “rush” periods will pay larger dividends on smaller investments where publishers are concerned. (xi)

Variations on this trope are to be found in other current histories of mining the American West. Jeffrey J. Safford, for example, in *The Mechanics of Optimism: Mining Companies, Technology, and the Hot Spring Gold Rush, Montana Territory, 1864-1868* writes that he intends to shift the emphasis in Montana history writing away from the boisterous, lawless west (“claim jumping, shootouts, dance halls, hurdy-gurdies, and saloons”) (xv). He holds, along that “the mining frontier has fared poorly in its effort to capture popular attention” (xv). These comments bear comparison to Curtis’s complaint, already cited, about the paradoxical obvious invisibility of mining in the American imagination. The truth of the Mineral West, of course, is a much more complicated story of “high expectations” and “dismal results” (xv).

Curtis distinguishes four “intersecting and overlapping mining episodes” which compose a history spanning from the 1850s to the 1880s: the gold rush, silver mining, copper mining, and finally a regionalized and corporatized development of a system of base-metal production (8). At each step, the historian can observe “a steadily growing commitment to an increasingly problematic undertaking, confronting proximate challenges only” (9). Individual actors, be they corporations or prospectors, remained preoccupied with immediate uncertainties and instabilities such that long-ranging, far-sighted policies and procedures never materialized. Frenzied exploitation of a known commodity (gold) reveals a more abundant or profitable, but less visible one (silver) and the process often repeats (as with copper). No one pauses to consider the overall geological picture—other than the geologists, of course, who I will come to later. This messy business proceeded alongside the development of transportation to and from the mining regions

as well as the social and political organization of these regions¹¹ and in the well-known case of Orion Clemens and his brother Samuel, of course, mining concerns positively drove the political organization.¹² I want to emphasize again Curtis's conclusion that the uncertain, chaotic nature of the formative gold and silver mining periods "both mapped and shaped the ethos of an entire region and eventually of the nation" and did so most importantly by producing mineralogical and engineering expertise and geographical and geological knowledge (21). Twain and Warner's novel, among other texts from the period, will supplement this view with a stronger sense of the contest between the science and know-how of speculators and prospectors against that of professional scientists and trained engineers.

In support of these historians' criticisms, many lesser-known publications, like those by Hittell and Mulford, express the complexities and confusions of mineral extraction at the time. A characteristic tale of the period, Prentice Mulford's "A Prospector's Story," published in the *Overland Monthly* describes the decline of one prospector's holding company and notably begins with a description of miners' intellectual habits: "Our conversation was metallurgical jargon, resounding in oxides, sulphurets, carbonates, gosson, and sulphates. We sent to San Francisco for

¹¹ Reporting to the US Geological Survey, Thomas G. Goonan and Eric Rodenburg write that Summarizing the 19th Century progress of mining in the United States, one can see the importance of policies based on the support for development. Pennsylvania anthracite coal (1830s and 40s) was developed to fuel the steam engine and iron industries with State funded canals. California gold (1850s), Nevada silver (1860s and 70s), Michigan iron and copper (1860 – 1900), Montana silver and copper (1880s), Arizona copper (1880s), Alaska gold (1890s), and Minnesota iron (1890s) were all facilitated by definitive government policies to acquire land, remove and control the Indians, privatize the land in the hands of the developers (primarily by means of the General Mining Law of 1872), and subsidize transportation infrastructure. (38)

¹² Twain recounts the matter in Chapter 25 of *Roughing It*, informing us that "In 1858 silver lodes were discovered in 'Carson County,'"—a part of Utah, and held more or less uncontested by the Mormons. With this discovery "Californians began to flock in, and the American element was soon in the majority. Allegiance to Brigham Young and Utah was renounced, and a temporary territorial government for 'Washoe' was instituted by the citizens. Governor Roop was the first and only chief magistrate of it. In due course of time Congress passed a bill to organize 'Nevada Territory,' and President Lincoln sent out Governor Nye to supplant Roop" (141). Twain's brother was the secretary of this government.

works on mineralogy, copper having the preference” (Mulford 336). Another article by John S. Hittell offers a survey of California’s mining “excitements” and how these excitements “profoundly affected” Americans (Hittell 413). The piece reads like a cautionary history of the boom and bust rhythm of gold and silver prospecting and notes with irony that “We have reversed the proverb, and two birds in the bush are worth more than one in the hand,” adding later that “the fact that only a dozen mines paid dividends, and that two thousand nine hundred and eighty-eight others cost more than they came to, did not seem to attract or deserve any attention” (416). The piece concludes with praise of White Pine, Nevada as “a new excitement, that promises to equal if not surpass any of those which have preceded it,” apparently disregarding the irony of the “reversed proverb” (417). While many will “lose by their expedition,” the author holds, in general the White Pine excitement “will be more profitable to the adventurers generally, and to the Pacific States, than any of its predecessors” (417). The boom-bust, speculative, high-risk trend continues, but *this time* it will be more profitable than before.

Clemens and Warner, dissatisfied by the life described by Hittell and Mulford, retire to journalism¹³—ready to critique the culture of extraction—Clemens eventually taking over the identity “Mark Twain” and Warner taking the helm of a cherished New England weekly. Yet the logic of extraction never entirely departs from either writer’s sense of modernity. Lawrence Howe and Gary P. Henrickson have both explored Twain’s literary entrepreneurialism, a kind of extraction of fame from fortuitous circumstances.¹⁴ Warner, for his part, waxes Thoreauvian in a

¹³ Mulford, an accomplished contributor to *The Golden Era*, did so as well. Hittell, on the other hand, continued to preach “the Gospel of California,” even if he didn’t practice it. See Claude Petty’s “John S. Hittell and the Gospel of California.”

¹⁴ In “Author, Author: Mark Twain and His Collaborators,” Gary P. Henrickson traces the pattern of Twain’s three famous collaborations with Charles Dudley Warner, Bret Harte, and Howells. In each case, Twain works hastily with a writer of greater stature and then dissolves the partnership when the work comes to fruition (or fails).

later chapter of his *My Summer in a Garden*, gently chiding his readers for wondering about the benefits (financial and otherwise) of gardening. And of course, in tandem, the authors return to extraction in *The Gilded Age*. Twain and Warner, along with their novel, then, are literary by-products of the Mineral West.

Surface, Substance, and Speculation

The Gilded Age associates idle speculation and curiosity with laziness and con-artistry—all of which fail to produce extraction of actual value. From its first chapter, economic speculation dominates the plot. Silas Hawkins, a forward thinking citizen of the backward Obedstown, Tennessee plans a move to Missouri while maintaining ownership of his Tennessee land. Missouri promises an immediate fortune to be derived from the westward expansion of railroads, and eventually such benefits will accrue to the land in Tennessee, Hawkins assures his wife, if they just hang on to it. “Pine forests, wheat land, corn land, iron, copper, coal—wait till the railroads come, and the steamboats!” he tells her (13). Silas’s speculation on the wealth of natural resources to be found on his land contrasts sharply with the sleepy, dirty, decaying survey the narration offers of the actual Obedstown and its citizens. This contrast between great expectations, as it were, and real work (or lack thereof) makes its starkest appearance when readers make the acquaintance of Philip Sterling and Harry Brierly, the two youths who, Trautwine in hand, also seek their fortune engineering for the railroad in Missouri.

Four acts of speculation, all pointing back to mineral extraction and previous discoveries of precious metals out west, drive the plot of the novel—and only one comes to fruition through productive labor: that of Philip Sterling. First, Silas Hawkins, believing that his Tennessee land

Henrickson characterizes Twain as businessman-like in this regard. I would rather point out the way these endeavors reduplicate the logic of extraction seen already in the speculative, furious, wasteful ethos of the prospector. On Howe, see note 8.

to be rich with coal, copper, and other natural resources, speculates that eventual sale of the land will bring millions to him and his family (a more timely sale for a moderate price would save his family much financial hardship when they resettle in Missouri). Then, years after his death, with an appropriate offer never having materialized, Silas's adopted daughter, Laura leads Washington Hawkins, family friend Beriah Sellers, and a US Senator, in devising the more or less fraudulent Knobbs Industrial University to justify the US government purchase of the same Tennessee land at a very inflated price. In a third act of speculation that runs parallel to that of the Tennessee land, Sellers, a man who can inspire fits of fantasy, speculation, and confidence in just about anyone he meets, speculates that he can bring the railroad to out-of-the-way Napoleon, Missouri, earning him and his associates millions in real estate deals. The Tennessee land never sells, the university isn't built, and the railroad bypasses Napoleon; only the fourth act of speculation comes to fruition. At the request of his future father-in-law, Philip Sterling surveys a piece of land, his newly-minted engineering degree in hand, and concludes that he will eventually find coal on that land. Philip's speculation differs from the others in some important details. Philip has both education and practical experience in mining and as a result, rather than placing his faith in a political scheme, he believes unswervingly in "his own study of the country...his knowledge of the geological formation" and "the uniformity of nature's operations in ages past" (213-214). As mentioned previously, the historical significance in this "uniformity" deserves foregrounding. As could be gleaned from a survey of geological treatises and textbooks from earlier in the century, "the uniformity of nature's operations in ages past" directly references Lyell's doctrine of uniformitarianism, one of the two major competing theories of Earth's natural history. The other theory, catastrophism, held that during periods of cataclysm, the fundamental geological forces went into upheaval along massive shifts in the structure of the

planet.¹⁵ Philip is on the cutting edge of science and has the professional discipline to apply this science for substantial profit while his speculating counterparts have only qualified, momentary *rhetorical* successes, convincing family, friends, and political representatives to buy into their speculations (sometimes with hard currency). They always fail to follow through with results, which in each of these cases would require practically applied science.

Philip's success comes about due in large part to his growing awareness of a contradiction between speculative theory and the applied practice—only the latter, he eventually learns, can lead to results. Philip appears to be aware, however dimly, of the problem of results from the beginning of the narrative. The knot of training and education, extraction of value, and the meaning of science bothers Philip time and again. When his friend Harry claims that making a fortune is easy, Philip responds that, ““It seems to be easier than it is,”“ marking the moment of Philip's formal induction into the culture of extraction. Noting of this hypothetical fortune that ““You'll never dig it out of the Astor Library,”“ Harry convinces Philip to follow him to Missouri, where they won't have a problem making a fortune as engineers-cum-real estate speculators (87). Before his conversation with Harry, Philip had already covered similar ground with law and letters. Though “law seemed to him well enough as a science...he never could discover a practical case where it appeared to him worth while [sic] to go to law” (89). As a result, Philip offers bad advice (non-lucrative, that is) to prospective clients, all of whom “Philip invariably advised to settle...greatly to the disgust of his employer, who knew that justice between man and man could only be attained by the recognized processes, with the attendant fees” (89). Philip also disdains “the copying of pleadings,” feeling that “a life of ‘whereases’ and

¹⁵ While the debate between saltation and gradualism is likely more familiar to students of evolutionary theory, see Jennifer J. Baker's "Emerson, Embryology, and Culture" for a succinct explanation of how the debate among biologists intersected with that between geologists.

‘aforesaid’ and whipping the devil round the stump, would be intolerable” (89). Philip, instead, “strayed off into other scribbling” and “in an unfortunate hour, he had two or three papers accepted by first-class magazines, at three dollars the printed page, and, behold, his vocation was open to him. He would make his mark in literature” (89-90). Philip has an immature grasp, or perhaps just an immature expectation, of how abstract science, practical application, remuneration, and personal enjoyment are to be balanced, leaving him equal parts cynical and dreamy. He will, at several intense moments throughout the novel, engage in complex daydreams in which he imagines an impossibly rich future contrasted by the solid, middleclass future he could have had had he committed himself to a profession immediately upon graduation.

The American preface of the novel also connects speculation and superficiality to the habits of the reading public by advances two bizarre propositions: that the novel will be counterfactual and the chapter headings are intended to help one *avoid* reading the book. The introduction will not offer the “usual apologies,” the authors inform us, since the book was not written for any of the usual reasons, that is, “for private circulation among friends,” or “to cheer and instruct a diseased relative,” or “to amuse an idle hour” (5). That these might appear to be *superficial* reasons for writing a novel, sets up the next claim, as highly ironized as it is, that the novel has intrinsic value for the public at large (or, as they write with a wink, the book will “take in the whole world”) (5). The novel “deals with an entirely ideal state of society,” they write, “and the chief embarrassment of the writers in this realm of the imagination has been the want of illustrative examples,” since

in a State where there is no fever of speculation, no inflamed desire for sudden wealth, where the poor are all simple-minded and contented, and the rich are all honest and generous, where society is in a condition of primitive purity and politics is the occupation

of only the capable and the patriotic, there are necessarily no materials for such a history as we have constructed out of an ideal commonwealth. (5)

This passage dizzies readers with the implication that the hilariously corrupt society of the narrative is a mere speculative fiction, and therefore perhaps superficial, contrasting with the actual, ostensibly “perfect” society cohabited by the authors and their readers. We are then dizzied further by a sudden shift in the meanings of superficiality, when the authors maintain that they need not apologize for the chapter headings since “such headings, with their vague suggestions of the matter which is to follow them, pleasantly inflame the reader’s interest without wholly satisfying his curiosity” (5). In other words, the chapter headings are “superficial,” in a non-moral sense this time, standing as surface indicators at the top of the chapter to “inflame the reader’s interest” so that he wants to dig deeper. Moreover, by including quotations in “a vast number of tongues,” they demonstrate their impartiality, after a fashion, showing they “do not write for a particular class or sect or nation, but to take in the whole world” (5). This completes the very complex joke of the preface. Readers across the world, they suggest, are likely to read *only* the headers, and then only those written in their own language—another indictment of superficiality, unwillingness to work, to learn, to dig deep, or to challenge oneself with substance. Moreover, it is by ‘virtue’ of this superficial kind of reading that the authors will succeed “to take in the whole world,” that is, readers will succumb to the authors’ confidence game due to their own (the readers’) superficiality.¹⁶

¹⁶ The preface concludes with a passage on which Christopher D. Morris makes ample comment:

One word more. This is—what it pretends to be—a joint production, in the conception of the story, the exposition of the characters, and in its literal composition. There is scarcely a chapter that does not bear the marks of the two writers of the book. (Twain and Warner 6)

Morris characterizes the phrase “bear the marks” as Twain’s practical joke on Charles Dudley Warner, by which the former essentially claims total authorship of the novel (See “Hermeneutic Delusion in Mark Twain and Charles Dudley Warner’s the Gilded Age,” especially 221-223). However, I find the hyphenated interjection here to be the most perplexing confusion of true/false meaning. It might be a paradoxical kind of affirmation: this novel *is indeed* what it pretends to be; it pretends to be coauthored and it is. Or it might be the statement of a puzzle: while each

Cummings argues that Twain wrote Laura's book buying vignette, in which she examines Howells's *Venetian Life*, in order to "signal...his appreciation of Howells' achievement" and also "reassurance that Howells could trust" Twain's taste (72). As Cummings notes, the scene exists largely for humor at the expense of a clerk with bad taste, but Laura's desired purchase, Taine's *Notes on England* serves to remind us of the paradox of the day's superficial scientism—everyone is talking about science, (the bookstore has advertised the newest translation of a currently in vogue scientific author) but most are not talking about it very well (the sales clerk at the store has not heard of the book). The superficial ubiquity of science in 1870s US print culture suggests that scientific themes would be both obvious and of negligible importance. As I've already noted with reference to the London preface, Twain saw the novel as handling "speculativeness" first and foremost. The American preface exhibits a connected concern with the confrontation of surface and substance. The involvement of the era's various cultures of science is no mere topical detail and yet, the neglect of the novel's specific scientific coordinates begins soon after its publication. Though both Twain and Warner received praise-laden biographical pieces in back-to-back numbers of *Appleton's* less than a year after the novel's publication, and though each piece mentions its respective subject's connection to engineering, prospecting, and mining in the West, neither piece has much good to say about *The Gilded Age*,

chapter bears the "mark" of both writers, the book is not truly coauthored, it only pretends to be. The statement hence might be appropriately added to a list of the novel's joint ventures that only pretend to be so: Sellers and anyone who will listen, but especially his act of summoning Hawkins to Missouri; the various joint ventures associated with railroading, the proposed university, and so on. Perhaps, also, Philip's commitment to the joint venture with Mr. Bolton, might be pretend, or at least performed, since devoting himself to Mr. Bolton is a way to devote himself to Bolton's daughter, Ruth. One might also ask if the interjection is meant to bring us back to the nascent superficial/substantial problematic of the novel-as-undertaking. If so, that would mean we must puzzle whether the coauthorship is a superficial or substantial phenomenon, adding layer to the problematic trope. This "super/sub" question is a problem for mining, minerology, geology, surveying, prospecting; it is a problem for economics; it is a problem for human interaction; it is a problem for law and politics; it is a problem for authors of novels (that is, for the novel-as-undertaking); it is a problem for readers of novels (the novel as cognitive map); and it is a problem for the novel-as-consumer-good (in this regard, many critics, including Budd, point out the super/sub conflict implied by the subscription marketing, illustrations, etc. and the conflict of these with the authors' intention to write a superior novel).

let alone specific mention of how the latter comments on the former.¹⁷ As for acknowledgement of its scientific aspects, it is likely that what seems like—and leads to—neglect of scientific themes *for us* began as simple obviousness. Sold by subscription, delivery of *The Gilded Age* began in 1873. The proceeds of Clarence King’s survey of the fortieth parallel were published in 1870 and reviewed in the *North American Review* in 1871, being only one in a flurry of geological surveys, manuals, and related materials published in the immediate postwar years. More generally, most prestigious literary publications had their own scientific corners, whether it was the “Editor’s Scientific Record” in *Harper’s*, *Galaxy’s* “Scientific Miscellany,” or the “Nature and Science” feature of *Scribner’s*. For the reading public, science was everywhere but often superficially so, a situation that suggests an eventual development of *obvious to negligible* meaningfulness for the various scientific matters that appear in *The Gilded Age*.

Given the success of Twain’s *The Innocents Abroad*, we might take his more or less superficial presentation of a passing geological curiosity to be representative of the contemporary attitude. Describing his party’s journey through the mountains of Smyrna, Twain makes some comical speculations concerning “three veins of oyster shells, just as we have seen quartz veins exposed in the cutting of a road in Nevada or Montana” (314). Twain writes, “My first instinct was to set up the usual,” a notice informing all comers of his previously existing “claim of five claims of two hundred feet each, (and one for discovery,) on this ledge or lode of oyster-shells, with all its dips, spurs, angles, variations and sinuosities, and fifty feet on each side of the same, to work it, etc., etc., according to the mining laws of Smyrna” (314-315). Twain then devotes a few paragraphs to theories of how the shells got up so high in the mountains. Twain puzzles even more briefly about a similar find in *Roughing It*—this time they are petrified birds eggs in a rock

¹⁷ See George T. Ferris’s “Mark Twain” and Edmund C. Stedman’s “Charles Dudley Warner.”

face. In both cases, Twain “leave[s] the geological reader to crack the nut at his leisure and solve the problem after his own fashion,” as he puts it in *Roughing It* (204). Twain’s response to geological depth and profundity is superficial and speculative curiosity.

Charles Dudley Warner, on the other hand, confronts the *profitability* of applied science in *My Summer in A Garden*. His work can be divided into two parts, the first meant to establish “the principal value of a private garden,” in which “to teach...patience and philosophy and the higher virtues,” one’s garden “becomes a moral agent, a test of character, as it was in the beginning” (9). Not without his own subtle (and sometimes not so subtle) humor—he later suggests a new science of “comparative vegetable morality”—Warner nonetheless admits a sincere concern for the meaning and value of gardening as an exemplar of applied science (74). The second part of his text, thus, highlights the rewards of months of steady devotion to the task, noting in one characteristic passage, “I find that gardening has unsurpassed advantages for the study of natural history” and in another, “I begin to feel the temptation of experiment. Agriculture, horticulture, floriculture,—these are vast fields, into which one may wander away, and never be seen more. It seemed to me a very simple thing, this gardening; but it opens up astonishingly” (109; 170). Twain and Warner are united by their exploration of the occasions of science as both mindset and methodology, which they indulge together as they confront the culture of extraction in *The Gilded Age*.

The Gilded Age is hardly alone in its multi-dimension treatment of science in the generalities of its social construction as well as in the specifics of fields, figures, and controversies. The European model of scientific learning and professionalism was only just arriving in the US in the 1870s and thus far from settled, as John A. Church was to note in his essay in the January 1871 number of the *North American Review*, “Mining Schools in the United

States.” Similarly, an 1869 piece by John Manning in the *Overland Monthly* subtly pokes fun at the unsettled and haphazard culture of extraction. Titled “Gold-Digging in Australia,” it jokes about local Australians’ reasoning that they too should search for gold where they were since “California was a new country; that was clear, for nobody had before ever heard of it. Australia was, also, a new country. Gold was found in California: therefore, there must be gold in Australia” (265). Would-be prospectors poke around at random with their pick-axes and a year passes fruitlessly. Then “a shrewd, yet uneducated man, [who] observed the geological formation of the gold-bearing districts [in California]” and “compared them in his mind with similar physical formations in Australia; returned, and, in 1850, discovered the Ophir Diggings, in the Bathurst District, New South Wales” (265). The piece closes with the scientific breakthrough in procedure concerning “bottoming”: the discovery that “gold may exist beneath a stratum of rock, no matter how thick...it is nothing unusual to go through three or four strata of rock” (270). Each of the publications mentioned above—and each in its own way—registers the poignancy of the value of training in hard science for the culture of extraction.

Twain and Warner’s novel holds up Philip as an ideal model because his attitude about science combines harmoniously with a network of attitudes about education, duty, speculation, and extraction. Furthermore, this belief-in-science doesn’t negate the culture of extraction; rather it regularizes it, as is symbolized by Philip’s return to extracting coal (a base mineral) in the East (an established region) after unsuccessful speculations in the West. Similarly, James S. Lippincott could write of the prodigious, reliable qualities of coal extraction in an article appearing in *American Naturalist* about a decade after *The Gilded Age*, noting that the Lehigh Valley, first developed in the 1810s, still produces voluminous amounts of coal as of 1880. Lippincott evokes the differences both of kind and degree to be found internal to the culture of

extraction, a culture that includes uneducated placer miners, elite European-educated engineers, coal mines that produce reliably for fifty years and more, and silver lodes (like the Comstock Lode) that show diminishing returns at an alarming rate—and far ahead of schedule. Similarly, speculation might work momentarily for Beriah Sellers and his proliferating list of hypothetical inventions and innovations, or for a younger Philip Sterling, deriving enjoyment in the theory of law (as a science rather than a practice). The novel is rife with other kinds of speculation as well, down to Senator Dilworthy's sponsorship of Laura Hawkins's wardrobe on the speculation that she will make an excellent lobbyist. However, the novel's conclusion affirms that it will take disciplined, applied science to sustain continuous extraction of mineral wealth (and its moral and political residuals). Hence, Twain and Warner do not reject the culture of extraction, rather they narrate an avenue of its salvation: supplementing speculation—and supplanting its corrupting influence—with polytechnical education.

The Prospects of Education

The nascent reform impulse in *The Gilded Age* recommends that scientific expertise, rather than speculative zeal, guide extraction. In a novel full of scheming and exploitation, Ruth Bolton and Philip Sterling's narrative arcs feature a conspicuous amount of education. Ruth learns early in medical school that "there were other things she needed to know quite as much as that which is taught in medical books, and that she could never satisfy her aspirations without more general culture" (152). Ruth, despite the poor plotting of her portions of the narrative, still manages to become a medical doctor a decade or so before Elizabeth Stuart Phelps's *Doctor Zay* (1882) or Sarah Orne Jewett's *Nan Prince*, in *A Country Doctor* (1884), but with this detour of general education at a liberal arts college. Philip's education takes a similar, but opposite route.

We first meet Philip as a typical young American man for whom “the paths to fortune are innumerable and all open.” Like most, though he “wanted to be rich, he had a sincere desire for a fortune, but for some unaccountable reason he hesitated about addressing himself to the narrow work of getting it” (86). Even though he suffers from this common affect—he “would have liked fame thrust upon him, for some worthy achievement; it might be a book, or for the skillful management of some great newspaper, or for some daring [scientific] expedition”—Philip also has some immediately visible distinctions (87). Philip is a Yale graduate of a serious and bookish nature, who is concerned that he doesn’t “know an engine from a coal cart,” and yet eagerly accepts Harry’s suggestion to go west and begin engineering. We read in this passage that Philip “used to say that if he should seriously set himself for ten years to any one of the dozen projects that were in his brain, he felt that he could be a rich man” (86). Philip’s arc explicitly traces a triumph over superficial speculation through training, education and systematic application of same. Engineering and railroading with Harry amounts to little for Philip other than an honest interest in the underpinning sciences and his devotion to learning them lands him the opportunity for riches managing a mine at Ilium, Pennsylvania. The ups and downs of this career find him many chapters later acknowledging that had he “adopted some regular profession, even some trade, he might now be a prosperous editor or a conscientious plumber, or an honest lawyer,” and on his way to marriage and homeownership. Instead he is stuck as a poor bachelor, “with only a smattering of civil engineering...thinking of nothing but how to get the coal out of the Ilium hills.” This “if” is offered by the narrator with a series of similar conjectures regarding other characters, most of whom have had even worse luck; all of these are offered as illustrations of “how things might have been better managed” if not for the fact that “it is impossible for the historian...to control events or compel the persons of his narrative to act wisely or be successful”

(356). The narrator recognizes money as the unfortunately unavailable solution to most of the problems faced by the characters. For Philip, “a little money...could unlock the stone door in the mountain whence would issue a stream of shining riches” (357). Things turn out well, for Philip, in the end—he eventually strikes coal in Ilium—not through “a little money, judiciously applied,” but rather through a belief-in-science that combines scientific knowledge and practical application, which together amount to certainty on Philip’s part—strained though it may be at times—that the Ilium mine will yield coal. No character, other than Ruth, achieves this kind of conviction. The novel holds up Philip and Ruth as ideal, not because they replace an inferior set of scientific conclusions with a superior one but rather because their attitude about science combines harmoniously with a network of attitudes about education, duty, speculation, and extraction. Furthermore, this belief-in-science doesn’t negate the culture of extraction; rather it regularizes it, as is symbolized by Philip’s return to extracting coal (a base mineral) in the East (an established region) after unsuccessful speculations in the West.

In its examination of the culture of extraction, *The Gilded Age* recognizes a structuring element of a larger picture: the dearth of accurate and expansive surveys, both in print and in the field, of the nation’s mineral wealth, subsidiary infrastructure, and their miss/management. Twain and Warner’s previous interests in science become an evaluation of its usefulness in *The Gilded Age*—and an indictment of the speculative habits that fall short of scientifically organized extraction. Echoing the novel—and anticipating Lippincott—educators and professionals publish arguments about education, science, a political reform hoping to steer the culture of extraction away from erroneous/fraudulent speculation. In periodicals across the country arguments appear concerning the value of geological surveys and polytechnical education, advocating strong government support of all efforts related to the exploitation of mineral wealth. Questions of

localized experience provided one of the debate's greatest flashpoints. Scholars, journalists, scientists, and prospectors disagreed as to the value of European mining school education when compared to education among the American corps of engineers on the very shafts, ledges, faces, and placer mines of the West. As Spence has noted, opportunities for educated, expert consultants were many, though this demand alone was not always sufficient to win them the respect and deference of experienced miners.¹⁸

In contrast to the chaotic atmosphere of risk, rumor, and speculation, James S. Lippincott could write of the prodigious, reliable qualities of coal extraction, in a number of *American Naturalist* appearing about a decade after *The Gilded Age*. Lippincott revisits a chapter in the early coal history of the US, focusing the Lehigh Valley of Pennsylvania, still a voluminous producer of coal when Lippincott wrote in 1880. Lippincott evokes the differences both of kind and degree to be found internal to the culture of extraction, a culture that includes uneducated placer miners, elite European-educated engineers, coal mines, like Lehigh, that produce reliably for fifty years and more, and silver lodes, like the Comstock Lode, that show diminishing returns far ahead of schedule. Similarly, speculation might work momentarily for Beriah Sellers and his proliferating list of hypothetical inventions and innovations, or for a younger Philip Sterling,

¹⁸ Chapters 2-4 of Spence's history cover the various educational avenues followed by would-be professional engineers and the actual career paths available to them upon graduation. Three of these were assaying, surveying, and "experting"—"a consultant, dispensing advice to whomever was willing to pay—mine owner, vendor, promoter, or investor, potential or actual. In this respect, the mining engineer served as a confidential counselor of the capitalist, the middleman, the operating company, and the mine manager" (79). Importantly, Spence explains, during the 1860s and 1870s, when technical experts were in short supply, many a new graduate of Freiberg or Columbia went almost immediately into experting, but he did so at his own risk. Most followed the more conventional pattern of working up the ladder as assayer or surveyor, assistant super-intendent of mine or mill, then superintendent, and finally manager in charge of all operations, before moving into the circle of examining consultants. Both trained and untrained mining men performed this work. For many, it was a full-time occupation, but for others it was a sideline activity. (84)

This brief description helps to qualify Philip Sterling's own bumpy career: beginning with surveying, becoming disillusioned with the free-loading culture he comes to associate with Harry and the Frontier, returning to school to actually learn the science, and from there becoming something like an expert and superintendent for Ruth's father concerning the business of the Ilium coal mine.

deriving enjoyment in the theory of law (as a science rather than a practice). The novel is rife with other kinds of speculation as well, down to Senator Dilworthy's sponsorship of Laura Hawkins's wardrobe on the speculation that she will make an excellent lobbyist. However, the novel's conclusion affirms that it will take disciplined, applied science to sustain continuous extraction of mineral wealth (and its moral and political residuals). Hence, Twain and Warner do not reject the culture of extraction, rather they narrate an avenue of its salvation: turning away from speculation (and its corrupting influence) toward polytechnical education.

Twain and Warner—along with other reformers—critique a mode of engaging science, not science itself, and much less the profit to be had by doing science correctly. The *North American Review* is the common source of two such appeals during the period of Henry Adams's editorship. Calling our attention to the “boom time” of the monthly periodical in the US after the Civil War, Crosbie Smith and Ian Higginson focus on the *North American Review's* struggles with low sales in this period. This larger context makes the smaller matter of Henry Adams' editorship particularly interesting, since Adams's singular intensification of critical, scientific authority must contend with economic pressures and the political climate in contemporary New England. While *NAR* had always championed “public reason,” a regime under which “individual readers, working in the privacy of their libraries, judge for themselves matters of public life in the absence of constraints from church or state,” Adams's scientism was of a more tendentious stripe (153). Smith and Higginson suggest, thus, that this kind of “progressivism,” whether morally beneficent or not, contrasts with objectivity, perhaps threatening the very public reason it is meant to advance. By the time of Adams's resignation as editor in 1876 scientific authority might appear to some as just another partisan viewpoint in a “social landscape” characterized by fragmentation of culture rather than the strong consensus of antebellum New England. More to

the point, “scholarly knowledge,” appeared to have “yielded to material power,” educated, vaguely clerical elites having been replaced by industrial ones (153-154). These cultural vicissitudes prime the tendentious nature of Adams’s editorial ethos, which intensifies critical independence and scientific authority to the point of partisan polemic, since, in Smith and Higginson’s characterization “it was Darwinism, natural selection, and human progress that dominated the *NAR* during Adams’s editorship,” which they also refer to as “the new evolutionary faith” (157). While evolution may have been the religion, articles like those dealt with above suggest that mining and geology were the political economy.

Henry Adams, if he was indeed the anonymous reviewer of King’s *Geological Survey*, connects quality literature to quality science. Reading the reviewer’s polemics concerning the civil service, we might forget that “King’s Geological Survey of California,” a book review, began by noting production value of the literary artifact, a “superb quarto, on heavy tinted paper” with illustrations “extremely well and clearly engraved and printed in colors” (204). Yet, the closing of the review neatly ties together matters of literary and scientific value with the political angle:

We cannot but hope that the day of crude reconnaissances and helter-skelter geological work, under government auspices, is nearly past, and that the example of thoroughness set by Mr. King, under the superintendence of the Engineer Bureau, may be imitated in some of the other departments at Washington. (210)

High-quality *literature* on important *scientific* matters will hopefully render much needed changes to the political and cultural climate of the day.

John Adams Church and Josiah D. Whitney join their voices to those of Twain, Warner, and Adams in the co-mingling of scientific, literary, and political interests. In his second of two

articles meant to demonstrate the value and procedure of geo-scientific surveys, Whitney addresses a general readership intending “to explain why geological surveys have been instituted in different parts of the world” and “what has been accomplished by them” (270). Of course, special attention will be given to the US, and specifically Massachusetts, home of *The North American Review*. Whitney holds that for “our people” to “take a high rank among civilized communities,”

it will be desirable, in the first place, not so much to explain what geology is, as to show what the economical bearings of the science are, and how it connects itself with the material welfare and progress of the State; and, with this object in view, the relations of different governments to the mining interest will be set forth, although necessarily in a very concise way, since a full development of the subject, demanding not less than a whole volume, would be quite out of place here. (271)

As in the review of King’s volume, Whitney here emphasizes the need for education with a specific reference to the exigencies of print. Though geological surveys “have been extended over so large a portion of the most enlightened countries” and are “constantly gaining in extent and in the scope and magnitude of the work undertaken,” Americans seems to have exceedingly little “appreciation of the nature of the operations of a thorough geological survey” (271). This is all the more problematic since “there are but few persons who have sufficient knowledge of the subject and confidence in the value of the work done to be able to use it as it ought to be used, in order that a full return for the outlay incurred may be obtained” (271). Anticipating *The Gilded Age* and, later, Lippincott, Whitney insists on the profitability of coal extraction over the chase after precious metals.

John A. Church adds a plea for education to this tangle; we need mining engineers and schools to train them, he argues in “Mining Schools in the United States.” Church holds that well-educated mining engineers are needed to render mining more productive and profitable and that these engineers must be educated at mining schools in the US, not abroad, because mining—as an applied, practical science—has so many local ramifications. Church surveys the existing institutions in the US, those “in New Haven, Boston, Troy, Philadelphia, Ann Harbor [sic]” noting that schools “where the instruction is general and complete, as at Cambridge and New Haven, lack the students necessary to form a living school, while the others have no claim to the title they have taken, except by virtue of a course of lectures on metallurgy or mining tacked on to their regular studies” (76). Church closes his appeal with a historical account of the “New York school” which began as “three or four cellars of the Columbia College buildings” specifically noting the school’s rapid growth—it went from nothing in 1864 to, at the time of his writing, a “collection of seventy-five thousand specimens...models of furnaces, machines, crystals, geometrical sections...a library of three thousand volumes” and more to boast about than this (80). He claims “no school in Europe, unless that in St. Petersburg is to be excepted, can compare with this in the appointments either of its chemical or its assay laboratories” (81). Hence, Church predicates sweeping changes—and enrichment—for the United States, if they can just manage to open more such schools, especially ones with easy access to mineral-bearing lands.

Curtis helpfully summarizes the conflict-ridden state of knowledge that so concerns Adams and Whitney. Whereas the prospectors that Warner and Twain would have been most intimately familiar with favored “knowing nature” with “an immediate knowledge” gained from “obvious conditions that presented themselves” on the ground, intellectuals like Adams and

Whitney were calling for a kind of “removed or abstract knowledge by which the immediate conditions would be interpreted.” “The gold rush miners,” notes Curtis, “brought with them what might be called an agricultural or superficial perspective on the landscapes they encountered,” but “professional mining men” who “thought in terms of what was underneath or behind, buried or concealed,” would win the day, especially if reformers like Adams, or scientists like Whitney had anything to say about it (97). As is confirmed by the comedic resolution of Twain and Warner’s satire, the culture of extraction neither comes into existence nor vanishes due to “science.” Rather, science used in proper ways—science of the right school, from the nicest books, mediated with proper care, transforms that culture from one of rustic speculation (not without its earthy Twainian charm) to an even more powerful, profitable, organized commitment to systematic extraction.

From this vantage point, the four documents under consideration could be plotted on a spectrum of naïveté, or if we wanted to be generous, we might call it a spectrum of scientific purity. Church, who takes a science educator’s view of a situation that is relatively free of complicated social or political entanglements, would be toward the “pure” end of the spectrum. Though he repeats the classic American trope of problems with “sectional prejudices,” for Church, this is only a matter of Californians knowing how to extract California minerals and New Yorkers knowing how to extract New York minerals. Whitney, almost equally faithful to this simple outlook still recognizes the sociopolitical, economic, and cultural resonances of the question better than Church—for Whitney, “civilization” is also at stake. A far cry from either Whitney and Church, we find Adams and Twain and Warner, all of whom, closer to the extreme “impure” or cynical end of the spectrum, recognize scientific matters and their noncontroversial social resonances but also add the dirtier, more complex realities of what we might call

realpolitik. Church's apolitical and optimistic presentation of the Columbia school contrasts starkly with that of the fraudulent Knob Industrial University in *The Gilded Age*. Likewise, Whitney's basically apolitical description of the geological survey contrasts with Adams's unmasking of the Sutro Tunnel committee as another instance of political corruption. This situation belies any simple heuristic of a two-sided cultural issue: in addition to apolitical scientists and unscientific politicians, we must recognize politically-minded scientists and scientifically-keen politicians—and we can't forget the novelists!

The conflict in *The Gilded Age* is not one between science and politics (somehow figured as opposites), but rather amateur science driven by speculation vs. systematic science used to bring speculative designs to fruition. Because Twain and Warner concoct a story (rather than teach a science, like Whitney, or work to organize a political cause, like Adams), the culture of extraction, as culture, can appear most palpably in their work. Or, as Bruno Latour might say,¹⁹ Twain and Warner isolate something fictional that nonetheless abuts Whitney's isolation of something geological and Adams's isolation of something political. The debate about mining schools and by extension, scientific and polytechnical education in the US, as well as the debate about the proper extraction of actual minerals are only components of this culture—major components, even founding components, but not the sole components. Twain and Warner's

¹⁹ Cf. Latour's explanation of ethnological "isolation" in the following passage from *An Inquiry into Modes of Existence*:

A second precaution consists in isolating the overly variable content of the countless position-takings called political, distinguishing these stances from a certain manner of grasping them only to pass them along. The ethnologist has to apply to this type of practice the same method she used to isolate the beings of fiction, technology, and religion. To grasp them, she has to concern herself not, initially, with the result—with the position-taking—but, as always, with what sends the course of action in a certain direction, something that we might call "preposition-taking." [...O]ur attention must shift from the contents to the containers, from what is happening—what is being passed along—to the gesture of making it happen—the "pass"...we will do well to shift our attention from the adjective "political" to the adverb "politically." If it is quite difficult to specify what a technological "object" is, we saw nevertheless...what it can mean to act technologically; and, as we now know, the difference is immense—even infinite—between speaking "about" religion and speaking religiously. (339)

material involvement with the applied sciences of westward expansion is no mere biographical accident. Literary realism, however one understands it does not *incidentally* cut its teeth on such a matter; its belief-in-science, its desire to accurately observe, analyze, and thereby understand social phenomena, draws its force, if not its primary motivation from the mid-century movements of this culture of extraction (hence, perhaps, the ease with which literary critics wield mining metaphors).²⁰

In his introduction to *The Gilded Age*, Louis J. Budd holds Twain and Warner accountable for the topicality of the incidents to be found in their novel which “when extrapolated into precepts, exacerbated an ahistorical myopia that saw a sudden flabbiness of moral fiber—reversible by a willing conscience—rather than a massive, qualitative shift in economic patterns and power” (xviii). These topical choices, in Budd’s view, undercut progressive thought on the day’s most pressing issues—for example, concern for the struggling and newly emancipated black population, which concern is only ever legible as fraud in the pages of the novel. I might go a step further than Budd, though, and hold *critics* accountable for not using *The Gilded Age* to its fullest potential. As I mentioned in the previous chapter, studies tying together literature and the sciences in the US, have gravitated to either side of the Civil War and Reconstruction period, coalescing around either the enlightenment scientism of the founding fathers, the 1850s flourishing of transcendentalism, or the vogue of “naturalistic theory,” as Eric

²⁰ Ward Just, explaining that writing about the capitol was new to US fiction at the time of Twain and Warner’s collaboration, writes “Washington was a rich vein but not much mined” (xxxvii). In her “Forward” to the Oxford Mark Twain edition of *The Gilded Age*, Fishkin anticipates Just’s trope when she quotes Ursula K. Le Guin as an example of contemporary authors who praise Twain’s language. A characteristic Mark Twain sentence, Le Guin writes “cover[s] an immense amount of territory in an effortless, aimless ramble that seems to be heading nowhere in particular and ends up with breathtaking accuracy at the gold mine” (qtd. in Fishkin, xx). Not speaking specifically of Twain, Camfield writes, of his reading in “sentimental moral philosophy,” “what I found was a vast, virtually untapped, intellectual gold mine, one that, while it had been discovered, had not been developed because it was difficult to extract the ore” (xi).

Carl Link has called it, characteristic of turn of the century literary naturalism.²¹ *The Gilded Age*, the novel of de-emphasized moment, published less than a decade after the end of the Civil War and narrating events that span the 1850s, 60s, and 70s, connects these otherwise disparate moments (c. 1780, c. 1850, c. 1890) through its depiction of the culture of extraction.

In his lengthy study of *The Gilded Age*, Bryant Morey French concludes a section titled “*Roman à clef* and *Exposé*” by affirming that “though there are a few other scattered allusions, so fleeting as not to justify extended research, the evidence presented in this and the preceding two chapters proves that *The Gilded Age* was a thoroughgoing exposé of its times” (1965, 141). This conclusion comes immediately following an example establishing that the magazines in which the (fictional) Philip Sterling publishes his papers on engineering are quite real. There is no need to contradict French’s conclusion, though I would add a rejoinder. The culture of extraction with its mineralogical and metallurgical prehistory is not one of the “fleeting allusions,” nor is it one topic among the many “characters and incidents” that contribute to the novel’s “fresh topicality” and its *roman à clef* qualities. The culture of extraction is the undergirding spirit of the times, captured by the novel.

The Gilded Age is hardly alone in treating of the generalities of the social construction of science as well as in the specifics of fields, figures, and controversies. *Miss Ravenel’s Conversion from Secession to Loyalty* (1867) gets its heroine to New England through the figure of her father, an amateur mineralogist who must flee the South because he refuses to make gun powder and other explosives for the rebels. Elizabeth Stuart Phelps’s *The Story of Avis* echoes

²¹ Link writes: “The term ‘naturalistic theory’...designates the amorphous set of concepts emanating from philosophical and scientific naturalism” which literary naturalist authors explore at the thematic level of their writing (19).

Warner's "comparative vegetable morality" when a secondary character, pondering the temperament of the titular Avis Dobell, wonders "Had anybody ever said that people resembled metals?" and carries on to pursue the mineralogical metaphor to explain Avis's magnetism (4). Novels exploring the vicissitudes of scientific professions, especially that of the medical doctor, are manifold throughout the postbellum period, the most famous of these arguably being Sarah Orne Jewett's *A Country Doctor* which I will examine closely in a subsequent chapter. Predating many of these, if not all, we have Ruth Bolton, whose insistence on attending medical school and becoming a doctor is totally extraneous to the plot of *The Gilded Age* until we recognize its scientific themes.

Ultimately, my analysis of *The Gilded Age* and the culture of extraction limns an aspiring status quo belief-in-science, in an effort to attend to the diffuse, metascientific matter of the changing relationship between "speculation," "imagination," and "truth." Debates about mining engineering, geological surveying, and polytechnical education deserve our attention as another component of the complex shifts in the sciences, professions, and educational institutions of the US in the final decades of the nineteenth century. Since Gillian Beer's groundbreaking work of literature and science criticism, *Darwin's Plots*, similar scholarly work has produced a detailed picture of the Darwinian *zeitgeist* and the place of literature within it. When we focus on the narrative of one particular figure or body of texts we risk missing Beer's larger point, that the languages and narratives of science and literature co-evolve and exert mutual influences (4-8). The ultimate value of exploring this culture of extraction, as I've called it, is to get at this diffuse matter of the changing relationship between speculation and the sciences, which also means to stay true to Beer's insight. I turn now to the wildest antithesis to the status quo of the culture of extraction, a belief-in-science that sees its power as the extrapolation of world-changing truth.

3. Demarcation Problems: Speculation, Extrapolation, and Pseudo/science in the Works of Ignatius Donnelly

By way of contrast to *The Gilded Age*, the writing of Ignatius Donnelly, though scientifically erroneous, positions extrapolative speculation as a liberating, popular mode of science capable of reimagining epochal truth. Though Scholars of late 19th century American literature, culture, and history typically read Donnelly as a figure of error-prone, even paranoid, passion, in this chapter I read Ignatius Donnelly for what his writing does, rather than to rehearse the sanctity of categories his writing violates. In an introduction to one of Donnelly's novels, Nicholas Ruddick describes Donnelly's habit of "solving nonexistent puzzles" as a way "to displace his mounting paranoia, the result of thwarted idealism and political disappointment" while and more recently, Alex J. Beringer reads Donnelly as a writer who "assumes...an underlying set of human intentions organizing the course of history...could be discovered through styles of investigation that seem counterintuitive to the public" (Ruddick xxii; Beringer 46-47). If any single figure authorizes the typically dismissive reading of Donnelly, it would be Richard Hofstadter, theorist of the paranoid style, who, while describing Donnelly's contributions to the Populist movement wrote that "certain types of popular movements of dissent...offer special opportunities to agitators with paranoid tendencies, who are able to make a vocational asset out of their psychic disturbances" (71). Though Hofstadter has been criticized for treating Donnelly mainly through the rhetoric of his most famous novel,¹ *Caesar's Column*, fuller treatments of Donnelly compellingly extend his recriminations with appeals to twentieth century philosophy of science

¹See Pollack's "Ignatius Donnelly on Human Rights: A Study of Two Novels," *Mid-America* 47.2 (1965): 99-112. Pollack argues that Hofstadter "cling[s] to the narrow thread" of a thesis advanced by an earlier critic, Oscar Handlin, who used Donnelly's *Caesar's Column*—exclusively—as proof of Populist antisemitism. Handlin "did not treat the book in its total context but only pointed to two ambiguous passages and indicated that the villain in the plot and another central character were Jewish" (100; 99). Regretting that "the character of Populism as thus drawn rested on a few scattered lines in *Caesar's Column*," Pollack devotes his article to recasting the novel, along with *The Golden Bottle* as thoroughly devoted to human rights.

and its foundational question, voiced most famously by Karl Popper, of how to demarcate science from non-science and pseudoscience. With the (often unconscious) pairing of these powerful traditions of Hofstadter and Popper, scholars of nineteenth century US literature have a supple discourse to enunciate exactly how Donnelly was wrong, wrong, wrong. These critiques employ Donnelly as an avatar of the erroneous past much as Twain and Warner might have invented him to be a caricature of the excesses of their present.

How wrong he was! Donnelly's corpus offers not one, not two, but three pseudoscientific tomes that obsessively pursue obviously erroneous—if not delusional—arguments. In *Atlantis: The Antediluvian World* (1882), he argues Atlantis truly existed and formed the basis of contemporary civilization. The sequel to this effort, *Ragnarok: The Age of Fire and Gravel* (1883), suggests that a comet impact ended a prehistoric Golden Age of humankind—the survivors of which lived in caves for some number of centuries before founding Atlantis. Then, in the work that deflated what little scientific reputation he had, *The Great Cryptogram: Francis Bacon's Cipher in the So-Called Shakespeare Plays* (1888), Donnelly devotes more than a thousand pages to a mathematical decryption of the Bard's output to establish the Baconian thesis. Many readers of Donnelly agree with sentiments like that of J. M. Tyree, who judges it worst of all that Donnelly's "virtually insane mathematical scribblings on his facsimile copy of [Shakespeare's] First Folio reveal that he really believed what he was writing" (11). Tyree holds that Donnelly was "quite possibly the greatest failure who ever lived" one who audaciously believed that, "by applying his mental powers to any problem, no matter how tangled or intractable, and regardless of the established body of relevant scholarship or scientific tradition, he could solve it with a fresh look" (5). If assessments like these make it seem odd that contemporary scholars would waste any time on Donnelly, they also underscore a narrative of

linear scientific progress, in which figures like Donnelly are usefully (if spitefully) contrasted with the truthier present and those honored few who are cast as its fathers. Such narratives treat the transmission of scientific knowledge from past to present to future with exclusivity—figures like Donnelly deserve study only to ritually deny their entry to the present. Certainly, Donnelly’s hubristic confidence won’t disqualify him from such treatment. “Nearly all the arts essential to civilization which we possess,” he writes in *Atlantis*, “date back to the time of Atlantis— certainly to that ancient Egyptian civilization which was coeval with, and an outgrowth from, Atlantis” (130). The nearly 500-page tome provides many similar instances of Donnelly’s self-confidence that, today, are basically illegible as anything other than pseudoscience.

To abandon Donnelly to such illegibility neglects the Donnelly I mean to study: an enthusiastic and creative writer who wants to keep critical speculation available for the general populace. There are other questions to ask about Donnelly as a scientific and speculative thinker, questions that go beyond checking facts and dismissing errors. Toward the end of *Ragnarok: The Age of Fire and Gravel*, Donnelly offers a riposte to cynics and pessimists who see man as “a creature seventy inches long prying into the purposes of an Awful Something.” When considering this “Awful Something,” and all the devastation it has visited on the earth, “covering it with débris, or causing its rocks to boil, and its waters to ascend into the heavens,” when we look at the geological record, we can still conclude that “nothing has perished that was worth preserving” (438). In fact, “so far as we can judge, after every cataclysm the world has risen to higher levels of creative development” (439). Our understanding of how scientific thought and writing was incorporated into the late-nineteenth century American imagination would be well-served by a reading of Donnelly (and any like writers) that sustains the probing speculative and philosophical bent of such statements while delimiting exactly how the author justifies the belief-

in-science that underwrites them. The Donnelly of scientific error, self-confirming bias, and political failure certainly exists. In these pages, however, I want to describe the speculative thinker behind these errors, a thinker who wants to wrest apocalypticism—the unveiling of epochal truth—from the hands of specialists, experts, and elites. For scholars of literature and culture, this ought to be the more valuable Donnelly, a writer who often reminds his readers, as in *Ragnarok*, that his writing is “not invading a realm where Science has already set up her walls and bounds and landmarks; but rather...a forum in which a great debate still goes on” (9).

Though his scientific claims were, in a word, wrong, his writing—both fiction and nonfiction—deserves continued study as writing that declares a minoritarian belief-in-science.

Though scholars don’t univocally deride Donnelly, most read him through an array of error-prone personae. Historians—like Hofstadter, and John D. Hicks before him—typically treat Donnelly as a Populist politician who had a writing career as a sideline. For Hicks, who wrote in the 1920s, Donnelly was a crank even if he was a genuine reformer, lacking the balance to be a true politician.² Hofstadter, in the early Cold War-era, and Tyree, in 2005, amplify this sentiment. While some scholars—literary critics and historians alike—treat Donnelly in isolation, as a unique figure, others group him with his contemporaries, whether writers of utopian fictions or populist orators.³ Literary critics, with Mark Storey being only the most

² Hicks asserts, “Donnelly was not insincere; he was in earnest, but he lacked a ‘balance-wheel,’” and goes on to suggest—as a consolation—the argument that I will explore in this pages:

His affinity for the novel or unique, his willingness to accept fantastic theories and to espouse untried reforms...made him the man he was. He, and others of his kind, are entitled to a place in history. Out of the visions which they see, the dreams which they dream, grow the realities of to-morrow. Many of their ideas are cast aside, but many of them, too, are taken up and made effective. (132)

Similar passages recur often in Donnelly scholarship—a few sentences, typically—serving to soften the blow of the dozens of pages of debunking and chronicle of failure that precede them. I invert this: dozens of pages valorizing Donnelly’s imagination with a sharp reminder of the limitations he faces.

³ See Hicks and Pollack. More recently, Alex J. Beringer offers Donnelly the dubious praise of having invented the “conspiracy novel,” which Beringer sees as a variation on the detective novel, meant to teach readers the narrative pleasures of paranoia.

recent example, often treat Donnelly as a member of a set of utopian writers whose narratives characterize a distinct moment of progressivist or reformist thought, circa 1890.⁴ Despite all this variety, however, a remarkably broad consensus holds that Donnelly's thought requires dismissal, however attenuated. Many such dismissals take an openly presentist position, as does that of Donald DeMeules who notes that "To our age of scientific sophistication [Donnelly's] battle in behalf [sic] of the Atlantean myth and his theory regarding the earth's collision with a comet undoubtedly appear the most Quixotic" (229). Here, DeMeules does not invoke an historical irony (namely, that it would only appear so anachronistically, to us, today) but rather prepares his own hyperbole: there are, in fact, *even more Quixotic* things Donnelly advocated. Scholars, that is to say, consensually identify Donnelly as a crank, pseudoscientist, Quixote, or paranoiac. To the detriment of our literary historical understanding of science in print, exceedingly few critics analyze Donnelly as writer of speculations or extrapolations.

Rather than *identifying* Donnelly's writing, sorting what *is* acceptably speculative or fictional from what *is* pseudoscience or some other kind of delusional non-fiction, I examine what his writing *does*. Studies of Donnelly that begin with "reality," the solid, transhistorical authority of fact (either Atlantis existed or it didn't) force Donnelly's writings to stand in for his (failed, distorted, paranoid) perceptions of reality and evaluate them for their accuracy. Rather than dismissing Donnelly on this basis, I explore the imaginative energies of his writing and the best way to do this requires a detour through the theory and criticism of science fiction (hereafter, SF). My aim is not to rehabilitate Donnelly by claiming him as an author of SF or as a

⁴ Mark Storey pairs Donnelly with Henry George, Edward Bellamy, and the lesser-known reformist/utopian, Henry Olerich, author of *A Cityless and Countryless World* (1893). Writing in the late 1970s, John F. Kasson writes the blueprint for chapters of this type, when his *Civilizing the Machine* devotes a chapter to Bellamy's *Looking Backward* (1888), Twain's *A Connecticut Yankee in King Arthur's Court* (1889), Donnelly's *Caesar's Column*, and Howells's *A Traveler from Altruria* (1894). Jean Pfaelzer's full-length study on this model, *The Utopian Novel in America*, taxonomizes her subject with chapters headed by Bellamy, Howells, and Donnelly, with the inclusion of a number of others.

precursor to SF—such claims have already been made.⁵ Rather, I will use SF theory and terminology, with some of my own modifications, to move a bit upstream from the conceptual watershed that Catherine Gallagher analyzes as “the rise of fictionality.”⁶ Since this “rise,” the sorting of texts into fiction and nonfiction has become the more or less unshakeable first measure of Anglo-American taxonomies of writing. I want to see how Donnelly’s writing looks if we temporarily, experimentally *suspend* this identifying measure.

Speculation, Extrapolation, Utopia—and Humility

So what do Donnelly’s texts do, then? First, they espouse a remarkable humility at two levels, by acknowledging historical fallibility⁷ and deferring to commonly available feats of reading and rationality. Donnelly’s training as a lawyer and experience as a political speaker appear in his writing—he “knew the end of his research...and from the beginning he determined to prove conclusively to the most skeptical reader that his theories were correct” (Anderson 33). Without ignoring such a calculating method, we can also focus on the baseline of humility—even if merely rhetorical—informing Donnelly’s work. Early in *Atlantis* Donnelly reminds us that “the fact that the story of Atlantis was for thousands of years regarded as a fable proves nothing” since “there is an unbelief which grows out of ignorance, as well as a skepticism which is born of intelligence.” He points to Pompeii and Herculaneum for a contrast—like Atlantis, these cities were, “for a thousand years...spoken of as ‘the fabulous cities.’” He also recognizes that his

⁵ Nicholas Ruddick, in his introduction to *Caesar's Column*, argues this as the chief reason to remember and read Donnelly.

⁶ In “The Rise of Fictionality,” Gallagher’s main aim is a concise and insightful treatment of 18th century British fiction explaining how fictionality in the novel created “a nonreferentiality that could be seen as a greater referentiality” (342).

⁷ Donnelly anticipates what Kathryn Schulz calls “the pessimistic meta-induction from the history of science” in her contribution to the compendium of scientism and technophilia, *This Will Make You Smarter*.

propositions on Atlantis—he lays out thirteen of them—are “somewhat startling,” assuring his readers that he will nonetheless prove them

by bringing to bear upon the question of Atlantis a thousand converging lines of light from a multitude of researches made by scholars in different fields of modern thought. Further investigations and discoveries will, I trust, confirm the correctness of the conclusions at which I have arrived. (4)

There are two levels of humility here. The first is an admission of historical fallibility: the historical conviction that Pompeii and Herculaneum were mere fables has been proved wrong, so we must imagine what else might, in the future, be proved wrong. At a second level of humility, Donnelly makes clear that he does not assign to himself any innovation beyond that of reading and reasoning. This is the fundamental statement of Donnelly’s belief-in-science, a conviction that any reader would have the acumen to perform such synthesizing labor.

Donnelly’s well-read rationality fuels his extrapolations, a second characteristic common to all his writings. From the beginning of his writing career, Donnelly values and models a kind of well-read rationality at a time when professional science was enshrining its subjectivity as something much more complicated, and—as described by Simon Newcomb, writing in the *North American Review* in 1874, “exact.” For Newcomb, exact science turns on “entire rejection of all speculation on propositions which do not admit of being brought to the test of experience.” Prediction and observation distinguish “the science of the present day...both from the science of the ancients and from the speculations of untrained minds on scientific subjects at the present time” (293). We will never find Donnelly contesting this model, though neither does he claim to follow it. Rather, he relies on “scholars in different fields” to have done the exact science and

maintains “trust” that “further investigations and discoveries” will confirm his reasoning—in a word, he *extrapolates* what future science will, should, or could find.

Donnelly’s writings function as “imaginary worlds” —extrapolations in the SF sense— even if they aren’t intended to be fictional. “Extrapolation” is a term dear to scholars of science fiction and while these scholars don’t necessarily agree on how it applies to the genre, most would agree with Gary K. Wolfe’s basic definition of extrapolation as “the technique of basing imaginary worlds or situations on existing ones through cognitive or rational means” (16). Wolfe also notes—importantly for our discussion of Donnelly—that this concept of extrapolation doesn’t “limit the genre to fiction of the future” since we can “adapt the word to include extrapolations about the past, about Alternate Worlds, and about other favorite themes” (17). In this sense, Donnelly’s *Atlantis* can be treated as an “imaginary world,” not because it is *fictional*, but because it is an *image*, an extrapolation “about the past” that uses “cognitive or rational” means—which includes the vast archive of science writing that Donnelly taps into. While Darko Suvin rejects extrapolation as a viable model for mature SF, preferring a more complex model of analogy, he notes that the extrapolation model was dominant in the proto-science fiction of Donnelly’s day. The time of Verne, Suvin explains, was dominated by scientific popularization and “anticipatory expectations.” During the rapid, intense changes of geopolitical and technoscientific horizons of the second half of the nineteenth century, “this SF demanded to be judged by the ‘scientific’ import of the tale’s premises and the consistency with which such premises...were narratively developed to their logical end, to a ‘scientifically valid’ conclusion” (27-28). Donnelly’s work conforms to this description—except, of course, for the detail of its fictionality. Yet, if we consider *Atlantis* as not a *tale* with premises, but a *text* with premises (and data and authorities) it can tell us just as much as SF proper about how science writing negotiates

between imagination and reality in ways other than those guaranteed by true/false and non/fiction binaries.

In addition to extrapolating in a literary sense, Donnelly's writing typically relies on formal or logical extrapolation, moving from possible to probable. Donnelly's exposition in *Atlantis* proceeds along lines of cognition that are clearly defined. Later in the work, he will explore more fantastic claims, based on comparative mythology, ethnography, and archaeology, but Donnelly begins with the formally extrapolative movement from the possible to the probable. After excerpting Plato's narrative of Atlantis, he begins a new chapter—duly titled “Was Such a Catastrophe Possible?”—by noting “all that is needed to answer this question is to briefly refer to some of the facts revealed by the study of geology” (31). He explains the use of coal deposits to measure changes in sea level, noting the vastness of the scale of such changes—both in time and area. For a number of pages, he documents recent catastrophic changes in major landmasses, such as a 1692 earthquake in Jamaica, during which “a tract of land...about a thousand acres in extent, sunk down in less than one minute, and the sea immediately rolled in” (43). He pays special attention to the volcanic history of the Azores, which Donnelly connects to Plato's tale of an island society in the middle of the Atlantic but also to a hypothesis about the contemporary emergence of a new island chain in the middle of the Atlantic, which, in a fascinating chain of quotation, Donnelly culls a gloss of Erasmus Darwin from Lyell's *Principles of Geology*. Through this excerpt, Donnelly moves from meteorological observation to scientific theory and back to myth and fiction, suggesting that the same volcanic action that Lyell notes suggests “that the vast oscillations which carried Plato's continent beneath the sea may again bring it, with all its buried treasures, to the light.” “Even the wild imagination of Jules Verne,” he continues, “when he described Captain Nemo, in his diving armor, looking down upon the temples and

towers of the lost island, lit by the fires of submarine volcanoes, had some groundwork of possibility to build upon” (44). This “groundwork of possibility” names the stage of extrapolation Donnelly unfolds here, connecting scientific, mytho-poetic, and novelistic acts of imagination. In other words, Plato, Donnelly, Lyell, and Verne all imagine something like Atlantis due to this groundwork of possibility.

Donnelly foregrounds readers’ cognitive participation in his writing. Donnelly concludes his “groundwork of possibility” with a tellingly negative statement: “But who will say, in the presence of all the facts here enumerated, that the submergence of Atlantis, in some great world-shaking cataclysm, is either *impossible* or *improbable*? [my emphasis]” (44). Though Donnelly often cannot resist more or less blind assertions (“The Azore Islands are undoubtedly the peaks of the mountains of Atlantis,” he writes at one point) the previous phrase emphasizes the minimal job he has accomplished, the mere demonstration that a geological event like the sinking of Atlantis is not “impossible or improbable.” The rhetorical question here (“who will say...[it]...is impossible or improbable”) invites cognitive engagement on the part of Donnelly’s readers. The fact that he foregrounds readers’ cognitive participation in the imaginative discourse ought to mitigate the excesses of Donnelly’s more bombastic conclusions.

Donnelly’s first three books, *Atlantis*, *Ragnarok*, and *The Great Cryptogram*, massive compendia of evidence, argument, and oratorically-styled persuasion that they are, together number well above two thousand printed pages. Yet the above example gives the basic procedure these treatises repeat as they pass through different kinds of evidence to defend their respective theses—successive demonstrations of possibility and probability lead to descriptions of what, in Donnelly’s view, happened and to successfully arrive at Donnelly’s conclusion, the reader must consider copious evidence, which, in Donnelly’s view, ought not to be encountered without a

view to a larger theory, an essentially cosmological theory. Combining elements of geology and biology, Donnelly states the theory most clearly in *Ragnarok*, joining “development and design, evolution and purpose; God’s way and God’s intent” as “two limbs of the right angle which meet at the first life-cell found on earth, and lead out until we find man at one extremity and God at the other” (406). And at many turns, Donnelly reminds his readers of the juridical process on which they embark: “I shall summon my witnesses that you may cross-examine them. I shall try, to the best of my ability, to buttress every opinion with adequate proofs. If I do not convince, I hope at least to interest you” (2). Donnelly presents evidence, arguments, or theories (scientific and otherwise) so that the reader can judge for himself. The reader has critical control of what a Donnelly text reveals—or whether it reveals anything. As most critics have recognized of Donnelly, his offerings are apocalyptic in scope; I want to emphasize, though, that fact that they are *offerings*—that the reader becomes the final arbiter of the apocalypse.

Donnelly’s fiction, like his non-fiction, emphasizes the reader’s role, as seen best with the end of *The Golden Bottle*. Published in 1892, *The Golden Bottle: Or the Story of Ephraim Benezet of Kansas* presents the story of the titular character, an impoverished farmer who solves his family’s problems (and then those of the USA, and then the world) with the aid of a bottle containing a magic liquid that turns anything it touches into gold. When this rags to riches to utopia whirlwind is revealed to have been merely a dream, a despondent Ephraim makes a desperate prayer for God to fix the world. Ephraim’s prayer is answered by another strange apparition like the entity who brought him the Golden Bottle, but this time, the being lectures Ephraim on his foolishness, explaining to him that his dream of the Golden Bottle was an allegory demonstrating that “the universe is nothing but work...you and I, and the rest have no place in it but as workers,” a positive message since “this is not a barren universe...every inch of

space is packed with spirit, even as every inch of matter is packed with life” (311-312).

Unsatisfied, Ephraim asks about the afterlife; there isn't any, the being reveals: “We create, you create, everything creates,” and that is all. To turn the emphasis on the creative labor of the reader, Ephraim concludes with a series of rhetorical questions to the reader: “What did it all mean? Had I really talked with an inhabitant of another sphere? Or were these my own thoughts, reflected back upon my mental consciousness?” (313). Ephraim essentially shrugs, resolving to tell his story to any who will listen, leaving the listener/reader to judge the factual, fictional, and/or allegorical value of the tale for himself.

Caesar's Column (1890) ends on a similar note—with a play allegorizing the utopian commune's rise from a global catastrophe. While Donnelly's narrator, in this case, tells us the intended meaning of the play and why it leaves out “the wolves...that used to prowl through the towns and cities of the world that has passed away,” he tellingly relates the play from the standpoint of the audience (366). *Atlantis* and *Ragnarok* end with similar, more or less literal, calls to imagination. Donnelly certainly sees himself as telling the truth, in some way; it would be dishonest to deny this simply to respond to characterizations of Donnelly as a pseudoscientist. It matters more, though, that the ending of Donnelly's texts point to a split in the power of prose. While the narrator must write what he sees as compellingly true, the conclusion of a work gives equal, if not greater, weight to the cognitive work reader-participants will do during and after reading.

Introductions correspondingly emphasize the limitations of his fictions. The openings of Donnelly's texts show that, while he holds his writing to be accurate, his greater concern is to expand the possibilities of his reader's thought. The propositions defended in *Atlantis* mean to “solve many problems which now perplex mankind” including to assess “the opening chapters of

Genesis” to “widen the area of human history” and to “explain the remarkable resemblances which exist between the ancient civilizations found upon the opposite shores of the Atlantic Ocean” (23). *Ragnarok* begins with a sense of wonder at the magnitude of Earth’s geological strata before recognizing we have yet to account for “the drift”—“a vast deposit of sand, gravel, and clay” that “may be fifty, one hundred, five hundred, eight hundred feet” deep (2). This “is our earth,” Donnelly proclaims, noting that “it makes the basis of our soils; our railroads cut their way through it; our carriages drive over it; our cities are built upon it; our crops are derived from it; the water we drink percolates through it; on it we live, love, marry, raise children, think, dream, and die; and in the bosom of it we will be buried” (2). The rest of the work will develop a theory of a cataclysmic meteor impact; by contrast, *Ragnarok’s* beginning is humble, suggesting only that the drift ought to be pondered carefully and thoroughly.

Significantly, over the course of his writing career, and as he switches to fiction, the introductions to his works become increasingly upfront about such limits. In the introduction to *Caesar’s Column*, he writes: “It must not be thought, because I am constrained to describe the overthrow of civilization, that I desire it” (3). He emphasizes the extrapolative nature of his work when he notes that the fraught social conditions of the late nineteenth century “have come about in less than a century; most of them in a quarter of a century” and hence, “Multiply them by the years of another century, and who shall say that the events I depict are impossible? There is an acceleration of movement in human affairs even as there is in the operations of gravity”; “The labor organizations of to-day would have been impossible fifty years ago,” he suggests (4). These are the “constraints” governing the novel which he was obligated to write: “Believing, as I do, that I read the future aright, it would be criminal in me to remain silent” (5). Crucially, Donnelly openly lays out his purpose and his premises—and he does so again in the introduction

to *The Golden Bottle*. Since “it is the outgrowth of the great political struggle” of the 1880s and 1890s, “it is intended to explain and defend, in the thin disguise of a story, some of the new ideas put forth by the People’s Party” (3). He adds: “It is not of so much importance that the author should glorify himself, by the perfection of his workmanship, as that he should set his readers to thinking.” Moreover, Donnelly believes “the intelligent reader will have sense enough to draw the line where argument ends and romance begins” (4). Taken together, the introductions and conclusions of his writings show Donnelly explicitly providing his readers with what Kenneth Roemer, in a different context, calls “perceptual tools.”

Writing on utopian fictions of the late nineteenth century, like Bellamy’s *Looking Backward* (1888) and Morris’s *New from Nowhere* (1890), Roemer compellingly focuses on reading as an imaginative procedure when he points out that “imagining utopia is a suspect enterprise,” and hence their authors typically rely on “perceptual tools” that “the readers’ culture has to provide” and evidence upon by which these tools might judge “correlations between the utopists’ imaginings and the reader’s realities” (81). Donnelly actively provides these tools as part of his speculative writing, equipping readers to encounter and then judge evidence, and then to walk away from the text with their judgments in order to apply them to the world beyond the text. Suvin describes a similar effect in his analogical model of SF, in which SF joins “a new vision of the world with an applicability...to the shortcomings of our workaday world” in a way that is “open-ended by analogy to modern cosmology, epistemology, and philosophy of science.” While “the cognition gained” under the analogical model “may not be immediately applicable, it may be simply the enabling of the mind to receive new wavelengths, but it eventually contributes to the understanding of the most mundane matters” (30). In this spirit, Donnelly urges readers to “Take your mind off your bricks and mortar, and put out your tentacles toward the great spiritual

world around you” (*Ragnarok* 441). Readers will do this best at the conclusion of one of Donnelly’s texts, having gone through the immense catalogs of evidence he provides. Whether the reader eventually *agrees* with Donnelly or not, having read him, they cannot have avoided *imagining* what Donnelly has proposed and *thinking critically* about the content of that imagination. So, when today’s literary critics write of Donnelly, like Alex Beringer does, that his “excursion[s] into heterodoxy provide a means of establishing a form of investigation available to the non-expert...establishing forms of intellectualism that assail the primacy of expertise and professionalism,” we need not read this description as a criticism (47).

Demarcation Problems

Evaluations the speculative, extrapolative characteristics of Donnelly’s writing may not satisfy those who would criticize his claims to science. To responding to these critics, I turn to the company Donnelly found himself in when publishing *Atlantis* in 1882.⁸ In an 1879 number of *Popular Science Monthly*, Edward H. Thompson publishes “Atlantis is Not a Myth.” Reviewing much of the evidence that Donnelly would employ three years later, Thompson also emphasizes the speculative horizons of his argument. Due to advances in various sciences, he explains, “we are beginning to perceive that we are but yet young in the knowledge of human history, that we have as yet picked up but a bright pebble of thought or glittering shell of theory, while before us lies the whole vast sea of human history unexplored” (764). Thompson, who devoted his career to the study of the Mayans and later recanted his views on Atlantis, concludes his piece by celebrating the “spirit of rationality” that has come to replace “the spirit of bigotry.” This “spirit of rationality” has a surprising definition, though, as “a spirit that tells men to look upon a new

⁸ That no reading of Donnelly has done this, I think, reinforces my wariness of presentism. It is enough for most scholars that Donnelly’s contemporaneous critics sometimes take scientific positions that agree with today’s state of knowledge; one need not investigate whether the matter was considered “settled” or “obvious” in Donnelly’s day.

idea or theory, even if it does run outside of the accustomed rut, with a reasoning if not favorable eye” (764).

We can contrast this readily with the ridicule of George S. Jones (like Thompson, mentioned briefly in my introduction), who, writing in *Appleton's* in 1874 worries that Abbé Brasseur de Bourbourg's theories on Atlantis will undo “the real and lasting services which” his work on Central American antiquity “rendered American students.” To this end, Jones recommends reading any such theory as “an elaborate *jeu d'esprit*” and then only by readers with “a taste for speculation” that relies on “ingeniously-drawn inferences and in rare bits of etymology” (820). Echoing Jones, Frank Wigglesworth Clarke, often hailed as the father of geochemistry, looks forward from an 1885 number of *Popular Science* to a time when something like Newcomb's “exact science” would be at the heart of civic affairs, using similar words: “A closet scholar, who lives only in books, a visionary theorist, or a mere popular lecturer, who reflects the thoughts of others, may lack the qualities which fit a man for dealing with practical measures; but, for the careful scientific investigator who studies things for what they are...a place is surely open” in civic affairs (586). The criticisms from Clarke and Jones implicate Donnelly without needing to point to error—it is an approach or attitude, a belief-in-science on which they want to foreclose.

In the twentieth century, Karl Popper, through his criterion of falsifiability, formalizes such efforts as “the demarcation problem,” still a matter of controversy among today's philosophers of science. Popper's simple argument, laid out systematically in “Science: Conjectures and Refutations,” that only theories which can be disproved can be called scientific, famously juxtaposes Einstein's theory of relativity to Freudian psychoanalysis—experiment could decisively disprove the former, but not the latter. Despite its elegant simplicity, Popper's

formulation didn't solve the problem, since, as Pigliucci and Boudry explain, philosophers since Popper have come to "recognize that science is not a unified type of activity and that an ever-changing continuous landscape may connect it with nonscientific endeavors" (1). Still, they insist, "if a theory strays from the epistemic desiderata of science by a sufficiently wide margin while being touted as scientific by its advocates, it is justifiably branded as pseudoscience" (2). No mere "exciting intellectual puzzle," philosophers of science begin with the demarcation problem to address the knot of social and epistemological issues implicit in the anti-vaccination movement or climate change.

With consequences for the appreciation of Donnelly, contemporary proponents of the demarcation problem often forget Popper's focus on *nonscience*—a term more inclusive than pseudoscience, which Thomas Nickels reminds us includes "not only pseudoscience and metaphysics but also logic, pure mathematics, and other subjects that cannot be tested against experience" (101).⁹ Nickels notes that some participants in demarcation debates actually disfavor science, as did Wittgenstein, who wanted demarcation to "protect ethics from the incursions of science" (103).¹⁰ Deviating from strict demarcation, I apply a multi-modal historiography to increase the dimensional depth of the demarcation question, recognizing, like Laura Otis, *both* historians of science, who deal with a succession of truths to produce a (relatively) unified narrative of scientific discovery, *and* literary critics, for whom "the issue of

⁹ Less invasive than many of his anthology colleagues, Nickels defines pseudoscience in kinder terms than some, as "enterprises that pretend to be scientific but fail to be testable, or that have questionable records of empirical success...including incompetent but honest work, potentially good work that is difficult to test or that has utterly failed to find empirical support, and deliberately dishonest scientific pretensions" (101). Nickels notes, "we now recognize that demarcation issues arise within scientific research itself"—a need to distinguish between "old-style science versus new, more promising science" and "sometimes the issue is which field has the responsibility for explaining a given phenomenon" (103).

¹⁰ Nickels argues that such voices are in the minority of demarcation debates, since, "demarcation has typically been a conservative exercise in exclusion" part of "the Enlightenment legacy" which aims to "preserve...and extend" "science, parliamentary democracy, and economic freedom" as "the sacred institutions of modern society" (105).

emergence, even of context, is eclipsed by the question of how texts make meaning”—historically subsequent texts, authors, or moments do not supersede one another in the way developments in sciences do (Otis 571).

In this spirit, I suggest we read Donnelly’s writing as evoking not one, but three demarcation problems. In addition to questioning the demarcation of science and nonscience, we can combine Nickels with Suvin and question the demarcation between texts that *test* subjects against experience and texts that *analogize* subjects next to experience. We can also, along with Catherine Gallagher, question the demarcation of fiction from nonfiction. Importantly, these boundaries would not be mutually exclusive. Like Suvin or Scholes¹¹, who approach SF with structuralist mindsets, we could imagine these demarcations organizing texts relative to the kinds of cognitive work they motivate rather than the generic characteristics they do or do not express. Applying a literary methodology to science writing, then, should have the aim of dissolving (and *not* resolving) the demarcation problems enumerated above. Focusing on what (and how) texts imagine, whether they are science or nonscience, fiction or nonfiction, empirically or analogically-minded, will help clarify what role “science” plays as a term in this imagination. When Thompson invokes his “spirit of rationality” and Jones his “*jeu d’esprit*” they both address

¹¹ In "The Roots of Science Fiction," Scholes describes science fiction as writing that "either accepts or pretends to accept a cognitive responsibility to imagine what is not yet apparent or existent, and to examine this in some systematic way," leading to what Scholes calls “structural fabulation,”

a kind of narrative which is genuinely fictional but strongly-influenced by modern science. It is specifically romantic in that it breaks, consciously and deliberately, with what we know or accept to be the case. But it develops its arbitrary parameters with a rigor and consistency that imitates in its fictional way the rigor of scientific method. Seen in purely formal terms, structural fabulation is a development of a tradition of speculative fabulation that has a long history in Western culture. This tradition itself is rooted in the genre of didactic romance, and can be seen as a dialectical antithesis of dogmatic fabulation. (216)

Scholes continues to diagram “romance” as a root style with two branches: "pure romance (sublimation with minimal cognition)" and "didactic romance (fabulation)." This latter is a root that has two branches: "speculative fabulation" and "dogmatic fabulation." "Speculative fabulation" is the root of two further branches "pseudoscientific sublimation" and "structural fabulation." "Structural fabulation," is back-traced with a dotted line and a question mark to "dogmatic fabulation." Explaining this diagram, Scholes admits that "to some critics I have seemed to invoke a new orthodoxy and to preach a new dogma called structuralism, thus establishing for structural fabulation a kind of religious sanction based on science" (216-217).

the imaginative act that speculates on the world of Atlantis, but science plays contrary roles in these imaginations. A hardline demarcation theorist might suggest that one of them defines science correctly whereas the other doesn't, but pointing this out does not change what these two writer's respectively *believe in when they believe in science*, or, to paraphrase Otis, how each writer uses science as a component of his meaning making.

Reading Donnelly as a writer of imaginative hypotheses can train us to see the overall relevance of science and science writing to literary study in a new light. While such privilege has long been granted to major writers—especially Darwin—Donnelly can help us realize that not only those who are scientifically “correct”—by the standards of Laura Otis's historians of science—affect the mutual shaping of the literary and scientific imagination. While it is not hard to disprove Donnelly's theses about Atlantis, it is harder to disregard his suggestion that finding Atlantis would have to change the political and ethical horizons of our civilization's self-consciousness. Donnelly shows us that science writers didn't only present new ideas, but also suggested new things to do with these ideas. Hence science writers, whatever their empirical truth value, can always be read as creators of new perceptual tools, in Roemer's sense.

Reading Donnelly in this vein will also answer another confusion of his legacy, by which, rather than taking him as a pseudoscientist, some readers, like Axelrad, associate Donnelly with “an agrarian mythology that could never be at peace with the unquestionable components of the twentieth century—the city, *technology*, *the factory*...and above all the farmer's loss of importance to a civilization ideologically removed from the land” (63; my emphasis). To resolve this problem, we can turn to Donnelly's theorization of the nature of myth, which comes in the form of a “fable of historiography,” giving his evaluation of science, generally speaking, in the clearest of terms. Here Donnelly positions mythography as a scientific method for probing the

depths of human history, since “the mind of one generation precisely repeats the minds of all former generations...for the brain is as much a part of the inheritable, material organization as the color of the eyes or the shape of the nose” (113). Before the printing-press appears, making “the thoughts of one man the thoughts of thousands,” one “innovator” might modify a tale “to his own satisfaction, to his immediate circle of hearers,” but “the narrative is being repeated in its unchanged form at all the rest” (114-115). This explains, according to Donnelly, the baseline similarities as well as the superficial departures of myths from various “primitive” sources.¹² Donnelly contrasts this kind of repetition with “written history,” which brings with it “the utmost contempt...for all legends.” “Philosophers [and] scientists” come to understand the limitations of written history as a repository of “recorded legends...the passions of factions, the hates of sects, or the servility and venality of historians” and go “out into Hindoo villages, into German cottages, into Highland huts, into Indian tepees, in short, into all lands, taking down with the utmost care, accuracy, and respect, the fairy-stories, myths, and legends of the people.” When these recordings were compared, Donnelly continues, they essentially proved that all the various peoples of the world, at some point in the remote past “dwelt together under the same roof-tree and used the same language” (116). “Place a universal legend in the minds of a race, let them repeat it from generation to generation,” he concludes “and time ceases to be an element in the problem,” adding that “legend has one great foe to its perpetuation—civilization” with its “contempt for everything which it cannot understand.” Civilization, as an organizing force either rejects myths or leaves them to the poets as source material and “hence we find the legends of the primitive American Indians adhering quite closely to the events of the past, while the myths that survive at all among the civilized nations of Europe are found in garbled forms, and only

¹² “Primitive,” for Donnelly includes European ethnicities and is distinct only from “civilized,” a matter of technological and economic or ecological *ethos* rather than an indicator of white/non-white inferiority.

among the peasantry of remote districts” (117). Donnelly looks forward to a future in which myth “will be accounted as more reliable, and as reaching farther back in time than many things which we call history” and “thoughtful men will analyze them, despising nothing; like a chemist who resolves some compound object into its original elements—the very combination constituting a history of the object” (117-118). Donnelly doesn’t intend to reject science, but rather protect it from what he sees as the stultifying, overly-skeptical prerogatives of civilization—he wants science to be open to deeper currents of history and imagination.

For Donnelly, it seems, meaning making doesn’t respect the proper demarcations. Readings of Donnelly as a conspiracy theorist or as the bearer of a paranoid or apocalyptic style rely on this assessment but risk missing a larger literary point.¹³ Donnelly endeavors to create a new style of meaning making, one that relies on analogy for its highest level of truth—hence his comment in the introduction to *The Golden Bottle*, that readers ought to know how to differentiate “argument” from “romance.” In the introduction to *Caesar’s Column*, Donnelly likens the social problems of the 1880s and 90s to cancer. Likewise in *The Golden Bottle*, he refers to “the contagion of debt” pages before describing “murdering bacilli” causing Ephraim’s lung ailment (14). These are compact examples of the kind of analogical thinking Donnelly’s texts do in their larger wholes as well—whether through extrapolative science in *Ragnarok* and *Atlantis*, or through proto-science fiction. Even when the stated goal of such a work is to defend

¹³ Edward H. Abrahams defines this “apocalyptic style” with analogy to his decryption of Shakespeare: Donnelly’s analysis of the cipher is long and tortured, involving multiplication, addition, and subtraction of long columns of numbers, but what is significant was his intense conviction that there existed a simple answer, despite its seeming complexity, for a problem he confronted. Later, as a Populist, he insisted with equal vehemence that there was a single, simple solution for America’s ills - the extension of the money supply. (107)

This, for Abrahams, is Donnelly’s apocalyptic style: that the “long and tortured” work of interpretation and extrapolation reveals a simple solution behind or underneath the byzantine detail of modern life.

novel propositions as true while exposing others as false, Donnelly always ends up with imaginative hypotheses that ask us to change the world by looking at it differently.

Democratizing Apocalypse: The Example of Gold

Donnelly's commitment to "free money" ties together his speculations into the past and future, demonstrating the priority of his devotion to confronting sanctioned thought with unsanctioned thought—over and above a commitment to orthodoxies of science/fiction/political writing. In an extended critique of precious metals, Donnelly argues we have been mistaken, if not actively deceived, and goes to great lengths to correct the mistakes he has found as well as to model a method for us to discover such error. Doing this has both scientific and political value for Donnelly, who would certainly agree with Shapin and Schaffer's conclusion that "the problem of generating and protecting knowledge is a problem in politics, and, conversely, that the problem of political order always involves solutions to the problem of knowledge" (21). Like these two do in their critical juxtaposition of Hobbes and Boyle, my reading of Donnelly emphasizes his belief-in-science as a form of social life. For Donnelly, the social form is a genre of speculative minoritarianism—in the face of "what is known," the *established* truth and the *establishment* that upholds it, Donnelly speaks to those who want to imagine something else.

Donnelly wants science used to unveil deceptions and attack the dogma that stand in the way the common good. While Pollack explicates Donnelly's belief in "the need for government to promote human potentiality," I would add that Donnelly thought science, as he understood it, to be the surest tool for achieving such an end (109). Hence his advocacy of "free money" and the demonetization of gold, which might seem one of Donnelly's most prominent obsessions gives another example of his scientific mindset. The push for "an abundant currency...issued by the nation itself" as "full legal tender for all debts...including duties on imports" was central to

Donnelly's various political campaigns (Hicks 96). He even wrote a didactic fiction, *The American People's Money*, to defend this cause.

The sciences that illuminate the murky waters of antiquity will also have something to say about this question, as he explores in a late chapter of *Atlantis* while developing a theory of money. "Every primitive people uses as money those articles upon which they set the highest value," he explains, glossing a table providing examples of "items of utility" also used as money in various ancient societies. Clearly, then

a metal-working people, manufacturing weapons of iron or copper, will seek for the useful metals, and hence we find iron, copper, tin, and lead coming into use as a standard of values—as money; for they can always be converted into articles of use and weapons of war. But when we ask how it chanced that gold and silver came to be used as money, and why it is that gold is regarded as so much more valuable than silver, no answer presents itself. It was impossible to make either of them into pots or pans, swords or spears; they were not necessarily more beautiful than glass or the combinations of tin and copper. Nothing astonished the American races more than the extraordinary value set upon gold and silver by the Spaniards; they could not understand it. (344-45)

Donnelly continues to point out that these same "primitive societies" still remember what our "civilized" societies seem to have forgotten, namely that gold and silver derive their value from ceremonial uses. Donnelly reminds us that in their "immense" European and Asian trade, the Atlantians "doubtless inquired and traded for gold and silver for the adornment of their temples, and they thus produced a demand for and gave a value to the two metals otherwise comparatively useless to man" (347). Then, to illustrate the perpetuation of this bygone value by Western

Civilization, Donnelly indulges in one of his characteristic syntheses involving etymology, archaeology, and comparative mythology, concluding:

Precisely as the physicians of Europe, fifty years ago, practised bleeding, because for thousands of years their savage ancestors had used it to draw away the evil spirits out of the man, so the business of our modern civilization is dependent upon the superstition of a past civilization, and the bankers of the world are to-day perpetuating the adoration of “the tears wept by the sun” which was commenced ages since on the island of Atlantis. And it becomes a grave question—when we remember that the rapidly increasing business of the world, consequent upon an increasing population, and a civilization advancing with giant steps, is measured by the standard of a currency limited by natural laws, decreasing annually in production, and incapable of expanding proportionately to the growth of the world—whether this Atlantean superstition may not yet inflict more incalculable injuries on mankind than those which resulted from the practice of phlebotomy. (347)

Ironically, by relegating Atlantis to the domain of myth, we perpetuate another myth as economic (and therefore scientific) good sense. Donnelly’s application of scientific study to the topic of Atlantis is meant to reverse this irony.

Though monetary policy was one of the great partisan issues of the second half of the nineteenth century, and Donnelly had his commitments, his critiques of obfuscatory traditions, like precious metal currency, go beyond partisan alibi. A two-chapter sequence of *Caesar’s Column* explores how science and learning can be misused, from both above and below, with the elite promoting erroneous distortions and the underclasses rejecting them outright. In the first of these chapters, Gabriel (the protagonist narrator of the novel) attends a meeting of workers where

the discussion turns toward education and then the sciences. A roughly dialectical debate has various speakers, in turn, rejecting education then revaluing it as a revolutionary tool, advocating a return to religion instead of education and rejecting this in favor of a revolutionary, scientific rejection of religion. Gabriel tries to resolve these contradictory impulses, arguing for a “Brotherhood of Justice” that will stay true to the teachings of Christianity while “its altars should be the schools and the ballot-boxes” (197). Though his argument is met with enthusiasm, another speaker argues that it is too late for the kind of progressivism Gabriel preaches, and instead advocates the overthrow and destruction of civilization. This idea is met with greater applause than those of any previous speaker—the dialectic has advanced beyond Gabriel’s position.

With Gabriel disillusioned as to how “men can penetrate farther and farther into nature with their senses, and leave their reasoning faculties behind them,” his benefactor, Maximillian, promises to show Gabriel the other half of the equation on the following day by taking him to a church service of the upper classes (206). On this occasion, Gabriel sees that the “keenly intellectual and highly educated” qualities of the congregation, the office of preacher has only survived, in this material age, on condition that the priest shall gather up, during the week, from the literary and scientific publications of the whole world, the gems of current thought and information, digest them carefully, and pour them forth, in attractive form, for their delectation on Sunday” (212). More to Gabriel’s horror, the thesis of the sermon appears to be that “the plan of Nature necessarily involves cruelty, suffering, injustice, destruction, death” (213). The sermon closes with the pastor reminding his congregation they can “rejoice to think that if, in this ill-governed universe, all cannot be blest, we at least rise above the universal wretchedness and are reserved for happiness” (216). Gabriel again addresses the audience, with similar arguments as

he made to the workers, but this time pointing out that the pastor and his congregation have replaced the humanizing love taught by Christ with the love of materialistic pleasures. The chiasmus drawn by the transition from workingmen to the rich reveals both to be majoritarian blocks resistant, if not totally immune, to the minoritizing arguments of Gabriel. Both sides end up equating education, science, and religion with injustice while Donnelly—in the voice of Gabriel—suggests a radically different synthesis: combining the acuity of the sciences with the human compassion of Christianity, education can be a tool to achieve universal human harmony.

If we read as partisans of the demarcation problem, evaluations of Donnelly's writing as utopian-utilitarian endorsements of science might appear demonstrably erroneous, if not ridiculous. Even before Popper, writers like Newcomb, Clarke, and Jones insist that *jeux d'esprit* and scientific verification ought to be mutually exclusive. For his part, Donnelly saw such an attitude as emblematic of plutocratic elitism, an attitude he criticizes through a newspaper article in *The Golden Bottle*, which refers to Ephraim Benezet, who, with his magical supply of gold, has undertaken to right the economic wrongs of his country, as the "ignorant and brutal peasant barbarian of Kansas." The article impugns his gold as fake, suggesting that

by some accident (*for the fellow has not the first element of scientific acquirement in his composition*) has discovered the art of transmuting the baser metals into something that looks like gold; we say looks like gold, for in the judgment of experts, it is simply an imitation of that metal. (emphasis added; 193)

The journalist's parenthetical further reduces Ephraim from "peasant barbarian" to an object that has a "composition"—and a composition free of "scientific acquirement" at that. In other words, worse than the fact that his gold must be fake, is the fact that he must have discovered it by accident. Having no scientific background, Ephraim would not even be capable of phony

science, let alone real science. The specific reference here also meta-textually impugns the conceit of the novel by comparing it to one of the pseudoscientific *desideratum* of alchemy, that is, converting base metals into gold. Ought we indulge in the fantasy of a miraculous gold-producing populist political salvation? Is such a fantasy applicable to our empirical reality? Can we get from such a fantasy to a (useful) allegory about the demonetization of gold? Is there anything more to this narrative than an infantile fantasy? To include a passage in which a journalist—an emblem of public sentiment, if not consensus—impugns an unsanctioned *novum*¹⁴ through an *ad hominem* attack intensifies the cognitive challenge presented to the reader by the novel as a whole.

Unlike the fictional journalist, or the author's real-life detractors, Donnelly shows a willingness to focus on the extrapolative potential of even objectionable ideas. Seeking to establish the story of Noah and the Flood as the Biblical echo of the downfall of Atlantis, Donnelly relies on a controversial theory of his day, found in Alexander Winchell's *Preadamites; or a Demonstration of the Existence of Man before Adam* (1880) among other writings.¹⁵ Citing Winchell, Donnelly reasons that if “the genealogical table given in the Bible...is not intended to include the true negro races, or the Chinese, the Japanese, the Finns or Lapps, the Australians, or the American red men,” referring only to “the Mediterranean races, the Aryans, the Cushites, the Phoenicians, the Hebrews, and the Egyptians” then “the Deluge could

¹⁴ Suvin uses the terms “novum” and “cognitive innovation” to denote the new thing or idea that motivates a piece of science fiction (63-64).

¹⁵ This text was a fuller treatment of Winchell's theory that humankind began before the Biblical Adam, perhaps fleshed out in vindication of an earlier treatment, in a work titled *Adamites and Preadamites; or, a popular discussion concerning the remote representatives of the human species and their relation to the Biblical Adam* (1878), which also appears to have been lost. Winchell has a post at Vanderbilt University. An anonymous biographer writes in the October 1892 number of *Popular Science Monthly*, that “at the commencement season of Vanderbilt University of 1878, Prof. Winchell was warned that his ‘heterodox’ position in reference to Preadamites and evolution was having an influence adverse to the interests of the university, and was asked to decline a reappointment to his professorship” (“Sketch of Alexander Winchell” 840).

not have been universal” (73). On this basis, for Donnelly, it is not hard to see that what was *internally* represented (by the People of the Book) as the end of the world must have been a narrative coming from the only nation that no longer exists, that is, Atlantis. Here Donnelly and Winchell depart—in more ways than one. Winchell’s command of geology, archaeology, ethnology and related sciences far exceeds that of Donnelly. In fact, Winchell would write a searing critique of Donnelly’s *Ragnarok* for the September 1887 number of the *Forum*. More significantly, though, would be Donnelly’s use of Winchell’s thesis as compared to Winchell’s own use.

Donnelly makes Winchell’s work, originally meant to prove “negro inferiority,” the basis for an ethnology that argues for a greater inclusion and harmony of so-called races. Winchell held that “Negro inferiority...cannot be explained by any appeal to adverse conditions” but is rather proven by “ethnological facts and...co-ordinated circumstances,” which he purports to demonstrate in *Adamites and Preadamites* (24). Donnelly takes Winchell’s pre-Adamite idea and makes it the basis of a greater inclusion, rather than a basis of exclusion, as Winchell intended it. Donnelly’s minoritization of the Biblical flood would become a load bearing piece of evidence in his later claims for the racial diversity of Atlantis, and a distinction between primitivism and civilization that is based on social and geographic determinations rather than race. Donnelly here is easily contrasted with Winchell, a champion of scientific racism, whose work aimed at conclusively proving the total non-relation of the white and black races, along with the inferiority of the latter, going so far as to write a rejection of the “experiment” of universal suffrage on such grounds.¹⁶ Donnelly routinely sights his sources as evidence for the reader’s consideration; Winchell—at least when writing to general audiences—sticks to authoritative (if

¹⁶ In “The Experiment of Universal Suffrage,” Winchell argues that, on the basis of their incompetence, the masses do not deserve power over American government and therefore universal suffrage is a bad idea.

not authoritarian) pronouncements, in the name of “science” and an undefined consensus of “geologists.” Whereas Winchell, the sanctioned geological expert, prefers to deny access (to enfranchisement, to science) to unqualified parties, Donnelly, even if he is writing mere romances, as Winchell charges him of doing,¹⁷ sees scientific knowledge as the ultimate horizon of inclusion.

As suggested by his ironic treatment of the alchemical motif in *The Golden Bottle* and his critique of civilization’s privileging of written history over folklore and mythology, Donnelly shows his concern with what is sanctioned (or unsanctioned) in thought to be equally relevant to what is true (or untrue) in fact. At the same time as he attempts to convince his readers of a new truth he also tries to convince them that an unsanctioned idea is not *ipso facto* an illogical or unreasonable one. Early in *Atlantis*, he points out the lack of fabulous elements in Plato’s story of Atlantis, “a plain and reasonable history of a people who built temples, ships, and canals; who lived by agriculture and commerce” (22). Anticipating the objection that Plato may have invoked Atlantis allegorically, he compares the plainness of Plato’s narrative to the philosophical and moral suppleness of Bacon and More’s utopian treatises. The possibility of Plato’s story has been set aside, he concludes, “because our predecessors, with their limited knowledge of the geological history of the world, did not believe it possible that any large part of the earth’s

¹⁷ In his review of Ragnarok, Winchell finds that Donnelly arrays so much that is true in science, and genuine in legend, and wise in proverb, and excellent in style, that if he means his book for a scientific romance, it is one of the most successful ever set afloat; while, if he means it as a sober argument for a striking theory, it stands by the side of "Paradise Found" as a phenomenal aggregation of varied learning sundered from its conclusions. (106)

For Winchell, this is ultimately inexcusable—Donnelly is essentially lying or disguising the true nature of his work, making the term “romance” more of a poisonous epithet than in its first use above:

One almost feels compunction in stepping forward to interfere with the genial author's harmless play upon the public credulity. But there's the rub. Is it harmless to inculcate fable with such gravity that a majority of readers accept it for fact? Does science receive no prejudice from an exposition as attractive and baseless as a romance, but dressed in the conventional guise of genuine science? Since the author has not seen fit to send forth his lucubration in the character of a romance, let us strip off its disguise and give it a passport for what it is. (106)

surface could have been thus suddenly swallowed up by the sea” and hence the idea of Atlantis became an unsanctioned one, not due to some intrinsic quality but due to the state of social consensus about geology (30).

This early argument for setting aside what Donnelly figures as a social limitation underlies the method of much of the comparative work—and most would agree, some of the greatest flights of pseudoscience—of the text. For example, Donnelly seizes on a much ridiculed (according to Donnelly) detail from Plato’s narrative—that upon sinking into the ocean, Atlantis made the Atlantic Ocean unnavigable for a time by throwing up mud from the depths of the ocean. He finds similar details in legends and myths from both sides of the Atlantic. While readers remain free to dismiss his book’s arguments on other grounds, Donnelly insists that scholars have erred by basing their rejection of Plato’s Atlantis on the grounds of such an incredible detail, since, in the modern epoch, “the explorations of the ship Challenger show that the whole of the submerged ridge of which Atlantis is a part is to this day thickly covered with volcanic débris” and Pompeii and Herculaneum “were covered with such a mass of volcanic ashes...that for seventeen centuries they remained buried at a depth of from fifteen to thirty feet; a new population lived and labored above them” (124). Donnelly often actively reverses sanctioning judgments by refusing to state ideas about Atlantis in a conditional voice. We read that Atlantis “is a part” of “the submerged ridge” and not that it “could be a part.” To this Donnelly adds a catalog of Volcanic eruptions, earthquakes, and other geological phenomena recorded throughout the eighteenth and nineteenth centuries, all of which were reported as causing difficulties for navigation of major waterways. Through such procedures of argumentation, Donnelly emphasizes the potential gap between what has been *accepted* as true and what *is* true. Donnelly leaves a space open for alternative hypotheses that other science

writers—including some of his own cherished authorities—preferred to close. Throughout his writing Donnelly models the confrontation of experts and nonexperts as a potentially liberating, expansive, experience rather than a subjugating and limiting one.

Atlantis need not be just a pseudoscientific urtext (distinguished ancestor to the History Channel's *Ancient Aliens* though it might be); it deserves a reading as speculative text that argues new knowledge about the past necessitates new visions of the present and future. *Ragnarok* is more than a foolhardy amalgamation of misunderstood geological data and folklore; it is a vision of the necessity of cataclysm to human history and a call to human ingenuity, urging readers that the capacity to survive “the End” and rebuild in its wake is a fundamental human trait. And just as *The Great Cryptogram* signals a shift in emphasis toward literary innovation, paranoia notwithstanding, his shift to fiction signals a need to place the confused, conflict-ridden American present within the context of social and scientific histories of truly geological duration.

Rather than develop this confrontation between Donnelly's speculation and the status quo rejection of speculation evoked by Twain, Warner, and company (discussed in the previous chapter) into a full-blown antagonism, chapters four and five turn to modes of belief-in-science based on skepticism rather than endorsement. If Twain and Warner on the one hand and Donnelly on the other appear, respectively, as representatives of success and failure, of the extremes of sobriety and intoxication supported by scientific speculation, then Sarah Orne Jewett and Frances Ellen Watkins Harper are representatives of more nuanced, contemplative, and measured positions. While *The Gilded Age* and the various writings of Ignatius Donnelly place geological belief-in-science at the center of totalizing visions of truth, Jewett and Harper each sustain their own beliefs-in-science while exposing the problematic or disaffecting valences of key speculative engines of social science. In contrast to those like Twain, Warner and Donnelly

who put their versions of “science” at the center of social life, Jewett and Harper advance their own perspectives on the social through critiques, both implicit and explicit, that push certain emerging concepts of science to the periphery.

4. The Value of an Individual: Sarah Orne Jewett as Statistician

Touting the 1873 fund-raiser for the Maine General Hospital, a young Sarah Orne Jewett publishes “Protoplasm and House-Cleaning,” a meditation linking the progress of civilization to the newly-founded hospital. “In all times and acts,” Jewett writes, “there is both a beginning and an ending...a completion, and the germ of something afterwards to be completed...the protoplasms that are to develop more and more through the years to come” (3). Jewett suggests that “the advances that are no longer new things to us, to which we have been familiar from our childhood, and which unless we stop to think seem always to have existed, were by no means made easily” (3). Jewett here actively joins nineteenth century debates about the nature of human social life and treating her accordingly helps restore the less demarcated times in which she and her scientist counterparts wrote.

In this chapter, I modulate Donald Pizer’s caution that, when ideas appear in novels, “criticism...must explicate such passages as complex fictional constructs rather than respond to them solely as ideas” (68). Pizer’s rule, though valuable, has the potential to blind us to the potential that a “complex fictional construct” is itself an idea.¹ Of course, if Jewett invokes Durkheim, as literary critics we should respond to Jewett, not Durkheim. But what if, despite the nonappearance of Durkheim in Jewett, her fiction nonetheless responds to him? I mean to suggest that fiction can itself be read as a counter-theory or counter-method to such “ideas” as might otherwise be considered only as appearing (whether for critical reflection, dramatization, or mere topical detail) in fiction. In this chapter, I argue that Jewett’s fiction joins social-scientific

¹ Similarly, Brad Evans’s *Before Cultures* “offer[s] a prehistory of the culture concept at several sites marked by their failure to deliver the concept as we know it” (3). Evans, too, is implicated in my revisionary argument: even if the denizens of the 1880s (etc.) failed to deliver some “concept as we know it,” I seek to recapture the concepts that motivated so much thought and writing in the era. Literary critics often fail (I use the loaded word supplied by Evans) to view such concepts scientifically, thus turning a blind eye to the successes of the authors they study.

debate about the proper use of description and the role played therein by the conceptualization of individuals as data points. This debate redoubles the catastrophist-gradualist tensions of geological thought, as I will illustrate through a reading of Jewett's regionalist fiction alongside the rise of statistical social science.

Reading Jewett as involved in the scientific debates of her day means to destabilize the tidier boundaries between sciences which produces truths, theories, and concepts and fiction which dramatizes—or in some other way echoes—scientific production. Treating Jewett's writings as a subset of the set of writings about social science restores, however tentatively, the less demarcated, compartmentalized, and disciplinarily ossified times in which she—and her scientist colleagues—wrote. Within this set, however, Jewett's belief-in-science can be read as a kind of gradualist extrapolation. That is, without completely capitulating to the attitudes she nonetheless describes in "Protoplasm and House-Cleaning," her fiction registers the question at the heart of nineteenth century social science: what does it mean to truly describe people? Or, to put it another way, how can people be data and how does that data make truth?

Unlike writing from Donnelly, Twain and Warner, and other's I've scrutinized up to this point—writing that places debate about science at the center of their literary endeavors—Jewett's writing explores social description alongside scientific debate concerning the pre- and descriptive consequences of the mathematization of statistical social science. The epoch of Jewett's *A Country Doctor*, *Deephaven* and *The Country of the Pointed Furs* is also an epoch which sees the disciplinary birth of dozens of departments of social science throughout American academia. At the same time, in scientific and popular publications, social reformers, civil servants, and scholars debate the descriptive and prescriptive techniques of these same sciences. These developments round off a century and more of collaboration and contestation between scientists,

professionals, and bureaucrats as to what value and truth derive from the mathematical methods of statistics. Throughout the historical development of modern science—even late into the nineteenth century—two conflicting schools of thought debated the role of numerical description in the sciences, imagining either accurate description through observation, quantification, and measurement or explanatory theory as the true goal of the sciences.² Combining recent scholarship on literary regionalism with studies of the nineteenth century mathematization of the sciences and simultaneous rise of the social sciences, I continue to limn the intersections and departures of literary regionalism (and realism more broadly) with the sciences of the mid-to-late nineteenth century explosion of professional science in America. Jewett’s fiction becomes another sight of speculation on the conflict between descriptionism (that measures things), theory (that explains them), catastrophism (that expects exceptional events) and gradualism (that expects typical developments). Jewett’s writing actively destabilizes these oppositions along with the prerogatives that drive them, proceeding with its own scientific acumen, testing truths through description. Jewett’s approach, then, contrasts with the dramatization of scientific dogmas to be found in both the writings of Donnelly, in the last analysis a catastrophist, and Twain and Warner, gradualist-descriptivists. To read the canonical writings of Jewett—*A Country Doctor* in particular—as contributing an alternative method of social knowledge (if not social science) will require attending to “Protoplasm and House-Cleaning,” a crucial piece of

² In *Trust in Numbers*, Theodore Porter points out that “measurement and even mathematization were often favored as evasions of theory” For example, “Lavoisier and Laplace...offered the quantitative results of experiments using their ice calorimeter as data upon which researchers of diverse theoretical persuasions could readily agree” thus making it less “necessary to choose between substance and motion theories of heat” (18). Hence, while “in theoretical writings, currents of mathematical realism, tending sometimes to geometrical or numerological mysticism, have run through science since Pythagoras,” still “the view of mathematics as mere description has been no less influential” with scientists, at least since Newton, often using such convictions as a rhetorical—and political—shield. Hence Newton’s famous claim to feign no hypotheses. “Descriptionism” furthermore enables “positivist philosophers and working scientists” “pursuit of control over nature” and thereby, during the unfolding of the eighteenth and nineteenth centuries, affects a dramatic reversal of power in the sciences on this very account, in favor of mathematical describers and away from theoretical explainers (19).

Jewett's correspondence in which the author specifically discusses her literary craft and inspiration, and the development of social science out of what could be called "social theory," a movement which involves the concomitant rise and eventual hegemony of number³ along with that of statistically-driven demography, psychometry, and biometry.

Jewett's fiction shares a significant terrain with the social scientists of her time, who, in one manner of reckoning, don't yet exist. "If, as social scientists, we were...transported to Oxford, the Sorbonne, or Harvard, in, say, 1870, we would find almost nothing familiar," writes Peter T. Manicas. He explains that, at this time, we would find "no 'departments' of 'sociology' or 'psychology'; the research practices of the faculties and the modes of graduate instruction of those institutions would be for the most part alien" (5). The final decades of the nineteenth century and the first decades of the twentieth witness the rapid birth and institutionalization of academic social science. At the same time as academics develop the categories and methods relevant to their proposed social sciences, the regionalist writing of authors like Jewett likewise affects the production of its own regions, as Hsuan L. Hsu has argued.⁴ While the American social scientists eventually align themselves with—and forever transform—a positivist, technocratic, numerically-driven ethos, Jewett's affinities lie with the descriptive prerogatives of travel and nature writing, which themselves stretch back to a style of statistics that was, by the

³ I am thinking of Alain Badiou's pronouncement, that "we live in the era of number's despotism," as evoked by Sarah Wilson in "Black Folk by the Numbers: Quantification in du Bois" (qtd. In Wilson 27). Though I wouldn't go as far as calling it "despotism" (hence my term: hegemony), I agree with Wilson's rationale for citing Badiou. Wilson writes that "numbers have gone without comment"—she is speaking immediately of Du Bois—because until very recently literary scholars have understood numbers as falling outside their domain [...]. Yet, as Alain Badiou has recently claimed, "number must be thought," because "we live in the era of number's despotism," number governing our accounts of the political even in the human sciences. In truth, neither omission nor attack fills the need for a rhetorical analysis of number, for treating number as absolutely different from other languages submits to its "despotism." Such approaches naturalize the divide between quantification and letters, rather than treating it as the constructed and historically specific estrangement that it is. (27-28).

⁴ Regionalist literature is not just literature about regions, its authors "produce, reimagine, and actively restructure regional identities in the minds and hearts of their readers" (Hsu 37).

mid-nineteenth century, if not decades earlier, outmoded by mathematical analysis. This original style, of eighteenth-century German provenance, dealt with descriptions of the myriad *states* of central Europe (hence: *statistik*) and was an almost completely verbal discipline disclosing the products, landforms, boundaries, and other vital characteristics of a given state. Such descriptive habits persist—in both fiction and nonfiction prose—but also in geography and cultural anthropology.

At roughly the same time, an alternative tradition, pioneered in the 1600s in England, was undergoing its own dynamics in both England and France. Originally called “political arithmetic,” this method of measuring and counting populational quantities, qualities and events and consequently making these measurements the basis of probabilistic calculations came to occupy the place of what today we call “statistics” without a second thought. Regionalist writing has nothing in common with this collection of methods—other than the domain to which they are applied, that is, the explication of social life as a phenomenon of circumscribable populations. And this is exactly the point. Framed in the now-classic terms of Raymond Williams: while the political arithmetic style of statistics heads toward dominance in the emergent field of social science, the residual tradition of descriptive *statistik* persists in writers like Jewett. Moreover, if we follow scholars like Hsu, or Mark Storey, such residual tools can be useful for understanding dominant categories from the outside.⁵ For Jewett, a spiritual successor to *statistik*, without some kind of evocative, verbal description, we lose something from the explication of the social. Affinities notwithstanding, Jewett’s telling appeal that we “read one human face aright” still admits the format of the countable, even if we “read”—rather than count—“one human face

⁵ Though they might disagree, if pressed, on the directions and valences of influence, Hsu and Storey both advance readings of regionalist writing, and Jewett in particular, in which they are partially constitutive the reciprocal dynamics of political, sentimental, and physical construction of regional peripheries (or 'the rural,' in Storey's case) and national/urban centers.

aright,” we still encounter “one face” (“Human Documents”).⁶ It will be hard to escape the multifaceted problem of what *counts* as social fact.

Society and the Social Problem Come to America

The drive to understand “the social” lies behind the rise of math-driven descriptionism as well as sociological modes of narrative fiction, like regionalism and realism. For historians of science, like Theodore Porter, understanding these developments requires that we point “the arrow of explanation in the opposite direction” when telling the story of the hegemony of quantification in the hard and social sciences (*Trust in Numbers* viii). In its broadest outlines, mathematically-driven statistical study proceeds from practical, professional endeavors, like actuarial and commercial calculation, its successes in these arenas drawing the attention of economists and bureaucrats, who begin applying it to governmental data-gathering and policy-making. Thus, as Porter concludes, “numbers, graphs, and formulas” assume their power “first of all as strategies of communication”—a power which arrives in science from politics, we might say (viii). In the wake of American Independence and the French Revolution, philosophers, bureaucrats, novelists, and scientists turned their attentions to “questions about society and its opaqueness in place of questions concerning rational people and their judicious choices” as French statistician Alain Desrosières puts it (78). From that point on, in Europe and England—and later, America—two axioms about this “society” were as problematic as they were unassailable: that it formed a coherent whole and that, paradoxically, this whole was more or less opaque, resisting cognition

⁶ Later in this chapter, I deal with the context in which Jewett delivers this plea in these specific terms (her introduction to a regular feature in McClure’s magazine). Here I am thinking again along the lines of Sarah Wilson’s keen deconstruction of number and statistical thinking in Du Bois—the “always already statistical” use of numerical figures (30). Wilson notes this fundamental tension in Du Bois’s use of number, thusly: “Even as he used numbers to evoke a very particular set of social conditions, Du Bois was unwilling to consign number to the limited status of sociological tool” (29). Jewett’s tension with number, and more abstractly, aggregation—how grouping individuals helps express the truth of the social, is just the opposite: delighting in the poetics of statistical thought, Jewett nonetheless does not want to totally dispose of the rhetorical power and privilege it allows.

by those on its inside. Society and “the social problem,” early social theorists concluded, were best studied mathematically—and, of course, this was not to be without its controversies.⁷ Calls like that coming from William G. Sumner, Yale professor who held America’s first sociology professorship, to use number-driven social sciences “to withdraw an immense range of subjects of the first importance from the dominion of a priori speculation and arbitrary dogmatism” appear in professional and popular publications throughout the nineteenth century (303). Various thinkers, like Sumner, set about theorizing the whole from a hypothetical outside, concerned mainly with developing tools adequate to such objective description.

The rise of social theory also anticipates the question of “social construction” as theorists and avowed social scientists debate the “reality” of the thing measured by statistical methods. Contemporary theorists of social construction, like Bruno Latour, argue that to speak of the production of truth is no metaphor: a network of agent-actors (Latour prefers the term “actants”) interact to construct the methods, measurements, and conclusions that make up “science.” Ian Hacking, in *The Social Construction of What?* offers a concise statement of the uses and disadvantages, as it were, of social construction theses in the aftermath of the “science wars” and the Sokal hoax. The back and forth, for Hacking, is simple: “One person argues that scientific results, even in fundamental physics, are social constructs. An opponent, angered, protests that the results are usually discoveries about our world that hold independently of society” (4).

⁷ What Desrosières describes simply as the emergence of the concept of society, Peter T. Manicas treats under the slightly more dramatic name of “the social problem.” In *A History and Philosophy of the Social Sciences*, Manicas chronicles the rise of this “social problem,” which first appears in England during its industrial revolution and engenders the response of the innovators of “political arithmetik.” The 1830s saw the rise of the Manchester Statistical Society and the Statistical Society of London. This latter conceived of four divisions of statistics: economic, political, medical, and “moral and intellectual” statistics. It was this last category that responded to the so-called social problem, indeed making it legible as a problem. These statisticians became alarmed, in short, at the growing rate of social diseases, beyond organic medical ones, such as “ignorance, ‘spiritual destitution,’ ‘impurity,’ pauperism, crime, and intemperance” (196-197). This same social question comes up, in Manicas’s narrative, on the Continent after the 1848 revolutions and in the US after the Civil War.

Despite the seeming impasse of this provocation, Hacking—who also seeks to distance himself from any dogma, pro or con, of social construction, lucidly analyzes its effectiveness in raising social consciousness, at least in “local claims...about the social construction of a specific X” (6). More to the point, “social construction work is critical of the status quo” arguing that “the existence or character of X is not determined by the nature of things. X is not inevitable. X was brought into existence or shaped by social events, forces, history, all of which could well have been different” (6-7). Hacking is still skeptical about more aggressive forms of this thesis that continue to suggest that because of this contingency, X is false or even detrimental to society. Latour, for his part, is clear that the critique offered by science studies, emboldened by the thesis of social construction, has always been of scientific certainty and not of the reliable knowledge and practice that scientific labor has produced.⁸ As with the formalization of the thesis of social

⁸ In *An Inquiry Into Modes of Existence: an Anthropology of the Moderns*, Latour describes science studies as a study “which has been working hard to give a positive meaning to the term ‘scientific institution.’” He continues: Now, in its early days, in the 1980s, this field was perceived by many scientists as a critique of scientific Certainty—which it was—but also of reliable knowledge—which it most certainly was not. We wanted to understand how—with what instruments, what machinery, what material, historical, anthropological conditions—it was possible to produce objectivity. And of course, without appealing to any transcendent Certainty that would have all at once and without discussion raised up Science with a capital S against public opinion. As we saw it, scientific objectivity was too important to be defended solely by what is known by the umbrella term “RATIONALISM [sic],” a term used too often to bring debate to a halt when an accusation of irrationality is hurled against overly insistent adversaries. Well before questions of ecology came to the forefront of politics, we already suspected that the distinction between the rational and the irrational would not suffice to settle the debates over the components of the COMMON WORLD [sic]. As we saw it, the question of the sciences was rather more complicated than that; we sought to investigate the manufacture of objectivity in a new way. And that is why we are always astonished, my colleagues in the history or sociology of the sciences and I, at the hostility of certain researchers toward what they call the “relativism” of our inquiries, whereas we have only been trying to prepare scientists for a finally realistic defense of the objectivity to which we are just as attached as they are—but in a different way. (4-5) I am, in this sense, hoping to add reality to literature (and all the other things with which it is conjoined) in the same manner often and variously described by Bruno Latour, which he never does more concisely than in “Do You Believe in Reality?” *News From the Trenches of the Science Wars*.” In response to the titular question of the essay, Latour writes in his characteristically affable manner:

If science studies has achieved anything...surely it has added reality to science, not withdrawn any from it. Instead of stuffed scientists hanging on the walls of the armchair philosophers of science of the past, we have portrayed lively characters immersed in their laboratories, full of passion, loaded with instruments, steeped in know-how, closely connected to a larger and more vibrant milieu. Instead of the pale and bloodless objectivity of science, we have all shown, it seemed to me, that the many nonhumans mixed into our collective life through laboratory practice have a history, flexibility, culture, blood—in short, all the characteristics that were denied to them by the humanists on the other side of the campus. (2-3)

construction, statistics, as the major mathematical technique behind social-scientific study, gives rise to a paradigmatic conundrum: in what does the reality, or alternatively, the conventional utility, of the thing being measured cohere?

Emile Durkheim famously writes that “The first and most fundamental rule [of Sociology] is: *Consider social facts as things*” (14). As Desrosières points out, so much relies on the construction “consider...as”: does it mean “treat them as if they are” or does it mean “social facts” must be considered as the things they truly are? Today’s statisticians and all those who employ statistics are comfortable with “formalized synthetic concepts” like “averages, standard deviations, probability” and so on—all typically learned as “compact concepts, encapsulated into concise and economical formulas—even though these tools are the result of a historical gestation punctuated by hesitations, retranslations, and conflicting interpretations” (2). Desrosières, though, charges that we must never lose sight of a pragmatic fact: “these techniques are intended to back up scientific and political arguments.” The social construction of knowledge is nowhere more palpable than in the invention of statistics, as Theodore Porter has also demonstrated.⁹

⁹ Here is the pith of Porter’s *The Rise of Statistical Thinking*:

Statists [“only late in the nineteenth century did they assume the title of statisticians”] familiarized the scientific world and the educated public with the use of aggregate numbers and mean values for studying an inherently variable object. Statistical writers persuaded their contemporaries that systems consisting of numerous autonomous individuals can be studied at a higher level than that of the diverse atomic constituents. They taught them that such systems could be presumed to generate large-scale order and regularity which would be virtually unaffected by the caprice that seemed to prevail in the actions of individuals. Since significant changes in the state of the system would appear only as a consequence of proportionately large causes, a science could be formulated using relative frequencies as its elemental data. (5)

The consequent change in the meaning of “determinism” elucidated by Porter ought to become a hallowed excerpt in anthologies of nineteenth century literature and culture:

Determinism was until the mid-nineteenth century a theory of the will—a denial of human freedom—and some dictionaries still give this as its first meaning. Partly as a result of statistical discussion, it assumed during the 1850s and 1860s its modern and more general meaning, by which the future of the world is held to be wholly determined by its present configuration. It differs from fatalism in that it rests on natural laws of cause and effect rather than on some transcendent force. Its opposite, we may note, underwent a similar change. “Indeterminism” now refers to the view that some events in the world are not wholly determined by natural causes, but are, at least to some extent, irreducibly random and stochastic. Indeterminism may be contrasted with probabilism, which implies simply that our knowledge does not permit perfect prediction, though there may be no exceptions to complete causality in the world. (12)

Many scientists and intellectuals throughout the 19th century—most famously Comte and Spencer—imagined social science to be the crowning achievement and final goal of all sciences. Looking back on the nineteenth century in “Fifty Years of American Science,” a feature of September 1898’s *Atlantic Monthly*, W. J. McGee wondered that “Half a century ago a shadow obscured a considerable part of the field of science, seriously obstructing its cultivation; it was the shadow cast by man himself, then held too sacred to serve as suitable subject for scientific research” (318). He goes on to acknowledge the pantheon who achieved “the gradual lifting of the shadow from science, the slow extension of the law of the uniformity of nature to the human organism” (318). Along with Huxley’s *Man’s Place in Nature* and Darwin’s *The Descent of Man*, McGee reminds his readers, “the American Morgan laid the foundation for objective sociology in his work on *Ancient Society* in 1877, while the Frenchman Comte formulated a subjective sociology, and the Briton Spencer pushed forward his imposing folios on *Descriptive Sociology*” (318). Michel Bourdeau writes, of Comte’s conception of sociology, “With its place at the top of the scale, the sociology of *the Cours* [*de philosophie positive*, Comte’s principal work] recapitulates the whole of knowledge, while the sciences that precede it are but one immense introduction to this final science” (“August Comte”).¹⁰ Spencer himself anticipates statistical methodology applied to social science in the opening of his 1851 *Social Statics*, though at least one of his current biographers, Mark Francis, emphasizes the subjectivist, post-

The shifts in such terms and the cognitive icebergs underlying them are profoundly meaningful for my study of Jewett (and Harper in the next chapter). It is, in fact my argument that Jewett and Harper deserve to be read as part of this shift in concert with scientists, mathematicians, pundits, reformers, and politicians.

¹⁰ To quote Comte in English—and for the purposes of a dissertation chapter on literature of American regionalism nonetheless!—is an arduous task. There is no unabridged English translation of the *Cours*, and of her English translation and abridgement, Harriet Martineau writes that “it is more a condensation than an abridgment...my object was to convey the meaning of the original in the clearest way I could” (viii). This “condensation” spans two volumes, each hundreds of pages long, and does not maintain anything like the structure of Comte’s multivolume work. This all goes to defend my reliance on secondary sources to gloss Comte.

metaphysical (and that is not to say anti-metaphysical), anti-Comtean drive of Spencer's thought.¹¹ Whether inspired by Comte, or Spencer, or some other source, a conviction that self-awareness and social control were to be the final goals of all science was likewise expressed as the core of "What We Mean by Science," in an article bearing that title penned by chemist Edward L. Youmans for the first number of Appleton's in 1869.

Noting that the word science is synonymous with knowledge, Youmans reminds his readers "that there are two kinds of knowing; we may know a subject loosely and vaguely, or with clearness and precision" (23). These latter characteristics, recognizably of Cartesian and Comtean heritage, outclass the former such that the term science should, in Youmans's view, signify "to know accurately" (23). Expanding on this, he gives the term its "full breadth of meaning" as "the latest and truest interpretation of the order of the world at which the human mind has arrived (23). It is the perfected mode of thinking in its application to all the phenomena of Nature which can become the subjects of thought" (23). The foregoing requires a definition of

¹¹ Spencer evokes the underlying motives of statistical thought when he writes that

We quickly find that every phenomenon exhibited by an aggregation of men, originates in some quality of man himself. [...] The characteristics exhibited by beings in an associated state cannot arise from the accident of combination, but must be the consequences of certain inherent properties of the beings themselves. True, the gathering together may call out these characteristics; it may make manifest what was before dormant; it may afford the opportunity for undeveloped peculiarities to appear; but it evidently does not create them. No phenomenon can be presented by a corporate body, but what there is a pre-existing capacity in its individual members for producing. (*Social Statics* 16-17)

Mark Francis, for his part, encapsulates Spencer as rejecting Comte as he stoutly attempted to re-establish metaphysics on the foundation of common sense. [...] Common sense no longer naively portrayed faculties that generated instincts of right and wrong. Instead, it had become an investigation of the truth of "universal beliefs" in the real world. These "beliefs" were universal because they were held by everyone; they were intuitions about metaphysical truths. Their purpose was to overturn the skepticism that had denied any possibility of real knowledge. The method used by Spencer in pursuit of these conclusions—which would seem mysterious if he is mistakenly classed with empiricists or positivists—was based on reason rather than experience. (177)

Hence, readers should not mistake Spencer for "a modern philosopher whose chief goal is to achieve greater clarity and rigor" since

his contemporary readership was not composed of professional philosophers, but of questing and earnest amateur intellectuals who were seeking meaning in philosophy and psychology with the same intensity as they did in biology and ethnography. To such minds all of these fields were merely different facets of life whose meaning was self-evident regardless of whether it was subjective or objective. This search was not specifically religious or scientific; it was both together. (184)

nature, which he specifies as “the whole system of appearances—objects and actions—by which we are surrounded in the present state of being” including “the entire realm of existence and activity, material and mental, with all their interconnections and interactions, which constitute the environment of man” (23). Scientific knowledge of the material world is thus “but a part of science”:

Our knowledge of mind and character, of the springs and limits of human action, of the relations of men and the conditions of social welfare, may be either loose and confused, or definite and accurate. This kind of knowledge conforms equally to the conditions of growth, and therefore, has its true scientific aspects. (23)

Nature, in short, is everything –it even includes the human mind. Of course, we can trace the historical and metaphysical unfolding of science, which is not a static or ahistorical affair. Youmans, indeed, sketches this, from “the purely physical sciences” to “more exalted questions of the real nature of man himself, and his true relations to the surrounding world, and to his fellow-men.” There is a lower to higher progression, here, as well, with sciences like physics, chemistry and biology preparing the way for psychology, sociology, economics, and ecology. “The cultivation of scientific, that is, accurate habits of thought,” ultimately aims to accomplish “the best preparation for action in all circumstances of responsibility” (23).¹² Youmans’s conception here describes the same kind of massive, systemic undertaking suggested by Comte’s positivism or Spencer’s system of synthetic philosophy. The ultimate quality of social science—that is, its quality as the final terrain of science—was no mere metaphysical matter. “Clear and

¹² In a happy coincidence, this article is followed immediately by “Adulteration and Its Remedies,” also authored by Youmans, in which the author calls for better public education in chemistry so that consumers will better be able to test and judge the quality of all manner of products. This article, in its turn, anticipates an article published a decade later, by Elisha Harris on “The Public Health.”]

precise” understanding of physical entities and mechanics (mass, velocity) prepared the understanding of less tangible entities (force, psyche, society) always with the goal of regulation.

The need for scientific study and intervention into the social is seen throughout late 19th century print media. In such a context, Jewett’s writing can be productively read as deeply probative, descriptive writing about social contexts and their interrelations, about individual anecdotes and testimonials from these contexts, and about the truths—spiritual and otherwise—that readers and writers encounter through them. In the *North American Review*, throughout the later decades of the nineteenth century, readers come across Elisha Harris’s plea for better public health policy, Alexander Winchell’s anthropological “proof” that universal suffrage will ruin America, and Congressman George W. Julian’s diatribe against social Darwinism, in which he worries that said theory obviates the passionate, innovative, moral spirit of the reformer. In the pages of *Popular Science Monthly* readers were treated to a long-ranging debate over the scientific value of individual testimony with consequences for the study of supernatural phenomena, like spiritualism, but also for ethnology, anthropology, and archaeology. Many of the American practitioners of these latter disciplines were desperately trying to establish the profundity and complexity of Ancient America, which one could read about across the print spectrum, from popular journals like *Harper’s* to specialized academic journals like the *Yale Review*.¹³ Jewett’s fiction, comparably concerned with understanding the social, often appeared in the same pages, as when her “Deephaven Cronies” shared an 1875 number of the *Atlantic Monthly* with “The Sanitary Drainage of Houses and Towns,” by sanitation engineer and animal

¹³ See Winchell, "The Experiment of Universal Suffrage"; "Topics of the Time: The Archaeological Institute of America"; Julian, "Is the Reformer Any Longer Needed"; Higginson, "The First Americans"; Flower, "Aims of the Study of Anthropology"; Carpenter, "On Fallacies of Testimony Respecting the Supernatural"; Beard, "The Scientific Study of Human Testimony I," "The Scientific Study of Human Testimony II," and "The Scientific Study of Human Testimony III"; and Adams, "On the Value of Empirical Generalization."

husbandry expert, George E. Waring Jr. This is not to say that contemporary readers would have recognized Jewett and Waring as of a piece; rather, I mean to emphasize that, whatever the consciousness of readers, editors, and authors, Jewett's writing takes part in a site of social construction (which in this case is actively *constructing the social*) alongside authors and texts that official serve that function.

A robust, clamorous construction site is also not the same as one with a unified cause, point of view, or purpose. Theodore Porter encourages skepticism concerning the well-worn argument which “holds that the social science of the 1890s and 1900s arose from a new sense of interdependence among Americans, and ultimately from the social and economic processes that produced that interdependence” (*Trust in Numbers* 6). For Porter, this argument misrepresents the diversity of social theory of the day. Porter enumerates “a variety of rival forms of explanation” with “most coming from preachers or labor organizers rather than professors” (6). Actual “academic social scientists” were more successful influencing bureaucracies rather than public opinion suggesting that each among the “rival forms of explanation” has its senders and receivers, its partisans and its antagonists (6). Moreover, influence on the public, or whatever amounts to the force or the power that we register when looking back, historically, does not travel directly from a sender to the public, but has to filter through some network of contestation—as Porter suggests when he depicts social scientists sending their messages to a bureaucratic audience under the gaze of elected officials, and only thence to the public. Literature (whether broadly or narrowly conceived) might form another such pathway. We can read Jewett as another “rival form of explanation” for the “sense of interdependence.” But where does she belong: with the preachers or labor organizers or with scientists, philosophers, and

academics? The best response to Porter's skepticism is additional clarity on the grounds of agreement and disagreement among the various forms of explanation.

The palpability of the social—its effective (if nothing else) reality—was a matter of consensus among the arts and sciences, but the relation of parts to whole, individual to social, was not. Whether explanatory tool or subject of scientific control, the power of the social had to be figured in a carefully finessed relation with the individuals that composed it. The descriptive coding of the social involves two distinct procedures, recording and formatting, as described by Desrosières. On one hand, there is “a social procedure of recording and encoding”—someone collects the data, and thus decides what is data and what isn't, and which data belong in which column, or, in the case of fiction, which elements and figures best evoke the local color. Then, on the other hand, there is “a cognitive procedure of formatting that reduces a large quantity to a small number of characteristics.” For a statistician studying frequency, this “formatting” decides the “attributes of the object.” For a policy maker or a sociologist wanting to have epistemic command of the object, the formatting decides “parameters of a model” (Desrosières 11). Such formatting obtains in the writing of fiction as well. Consider the wealth of authorial decisions concerning the description versus the invocation of a given character's accent or dialect in fiction: a given author decides, first, *that* certain accents deserve (or not) representation, and, second, what constitutes “an accent.”¹⁴ The accents of Jewett's Bostonians aren't noted in any

¹⁴ A task which, more or less beyond the purview of this chapter, Gavin Jones undertakes in a book-length study, *Strange Talk: The Politics of Dialect Literature in Gilded Age America*. Jones's central claim is that the vernacular voice was an ambivalent power in late-nineteenth-century America. Dialect had a mixed heritage. It could seem rooted in Anglo-American culture while also registering the effects of ethnic intermixture; it could evoke the ideal stability of America's regional past while also signifying concern over an increasingly unfamiliar and fragmented society. (13)

Regionalism has a central place here, too, since it indicated that

America was acquiring a characteristic literature from voices and places that were strange and varied when compared with the nation's literary heritage. The period's major works of regional fiction reveal the moral complexities that arose from this ambivalent sense that vernacular language could create yet disrupt national identity. (13)

way, though to Chicagoan or Floridian readers of Jewett they might be quite thick, and yet the more authentic an individual representative of Maine is, for Jewett, the more apostrophes and non-standard spellings appear in his or her speech.¹⁵ While as mere readers of fiction, we might be able to take such parameters of a model and attributes of the object for granted, the further we dive into the theorization of social research in the nineteenth century, the less stable the evidence becomes.

For public health experts, like Waring, epidemiology required understandings of biology and physiology—that is, what happens to an individual sufferer of a disease—but also data concerning the populations of cities, that is, where and how people live *en masse*. In the last analysis, control of an epidemiological problem required policy that affected a social solution. Similarly, anthropologists, ethnologists, and archaeologists sought scientifically accurate—testable, adjustable, measurable—ways to connect individual ruins, or bones, or testimonials to the description of social wholes. Otherwise, as Thomas Wentworth Higginson lays out in a *Harper's* article titled “The First Americans,” scientists could only rely on the exaggerated descriptions and erroneous axioms of bygone explorers of Mexico, Central, and South America. Writers of fiction of that same era also probed the connections between individuals and society and—since the 1980s, at least—there has been no shortage of scholars refining our sense of what Amy Kaplan formulated as “the social construction of American realism.” Each of these undertakings eventually arrives at the tension of qualitative versus quantitative description—or “formatting,” in Desrosières’ sense.¹⁶

¹⁵ Josephine Donovan, in her *Sarah Orne Jewett*, holds the depiction of regional dialect to be “one of the distinctions between outsiders and locals in Jewett’s fictional world. The insiders speak in dialect. The visitors do not. Later Jewett persona do not use dialect, which perhaps indicates a shift in her own self-image” (27).

¹⁶ Anthropologist Herbert S. Lewis, for one, holds this tension responsible for the waning of Franz Boas’ reputation in the twentieth century. According to Lewis, his twentieth-century critics found Boas to be insufficiently committed to “the search for regularities, causal relations, and laws” and too willing to place “emphasis on individual

The risk of social thought becomes clear here: rendering individual examples as data might just erase anything that made those individuals, in a word, exemplary. In a mathematical procedure “the individual” might be *recorded* as a numerical instance of what is formatted as a case, rather than *narrated* as an occurrence of what is formatted as an example. Rates of birth, death, and alcoholism depend on counting cases, not familiarizing oneself with life stories. By relying on the basic countability of cases and—more poignantly—the patrician perspective that would dismiss such individual cases as not worth knowing in any other way, individuals come to matter only in larger aggregates. Even when an ethnographer takes interest in a specific case for its exemplary power, this power may begin with the individual’s mere countability as a case. Examples become inescapably *ordinary*: first example, second example, third example. Yet, two of the dominant models for understanding statistical data, that of Quetelet and that of Galton,¹⁷ relied on some sense that the average calculated from a population of individuals itself needed to be an individual, whether existing actually, virtually, or ideally. The quality of individuality never quite disappears and sociological forms of storytelling (can) resist the technology of

phenomena (individuals, specific peoples, and particular histories), human choices, variation, diversity, and chance” (382).

¹⁷ Michael Bulmer, in *Francis Galton: Pioneer of Heredity and Biometry*, points to what historians of science recognize as “a probability revolution” extending from 1830-1930,

which led to the application of probability theory and statistical models to a wide range of problems in the natural and social sciences. The revolution began with the demonstration of statistical regularities in social data by Quetelet, on which he built a science of ‘social physics’; Quetelet’s work inspired both Galton’s statistical theory of heredity and Maxwell’s statistical interpretation of the kinetic theory of gases. This growing range of applications reflects the increasing acceptance of statistical laws as valid scientific explanations. It was accompanied by a reinterpretation of the meaning of probability, from rational degree of belief to relative frequency in the long run. (168)

This revolution eventually led to Galton’s development of regression and correlation, which were more rigorously mathematized by Karl Pearson. On this basis, Galton and Pearson “construct[ed] a statistical theory of heredity” (168-169). The “normal distribution” with a provenance extending from Laplace and Gauss, circa 1810, was central to this theory; Galton likely first read of this technique in Quetelet’s 1846 *Letters on Probabilities*, which received English translation in 1849. By the 1870s, this method, “which states that the sum of a large number of independent random variables of individually small effect follows a normal distribution, almost regardless of their individual distributions,” was being called the “normal distribution” by C.S. Pierce (a term perhaps used for the first time in his “Illustrations of the Science of Logic,” which ran in *Popular Science Monthly* from November of 1877 to August of 1878), Galton, and Wilhelm Lexis (German pioneer of the concept of life-expectancy).

quantification while still accepting its premises: the proper presentation (whether by aggregation or some other method) of individual cases evokes social truth. Another contour of this problem is seen in local color fiction, where individual stories need to evoke the regular, average, summary reality of the locale while at the same time presenting something or someone colorful enough to merit representation. Studying Jewett as a social theorist, then, sheds light on the speculative debates at the heart of this quintessential nineteenth century desideratum of rendering individuals as social data.

Jewett's Regional Fiction: A Social Theory

As it both embraces and problematizes the various formatting techniques (aggregation, description, and objectivity chief among them) that characterize social science, Jewett's fiction can be viewed as another response, or hypothesis, or experiment in the overarching debate about the description and translation of the individual necessary to calculate (or narrate) the social. Jewett stages a conflict of the methods and goals of social science by rendering the individuality of the individual problematic, eventually—with *A Country Doctor*—along the gradualist-catastrophist fault line. Though the problem of the individual appears in fiction generally, as Catherine Gallagher¹⁸ works through in "The Rise of Fictionality," the specific interest of

¹⁸ This problem has been at the center of literary theory at least since the days of Lukács and Auerbach. Auerbach refers, in *Mimesis*, to "the embedding of random persons and events in the general course of contemporary history" (491) and later emphasizes the importance of Stendhal and Balzac, who "took random individuals from daily life in their dependence upon current historical circumstances and made them the subjects of serious, problematic, and even tragic representation" thereby breaking with "the classical rule of distinct levels of style" or decorum, as it might be concisely denoted (554). Lukács, in *Theory of the Novel*, writes likewise of the "essentially biographical" "outward form" of the novel that solves the problem of "exemplary significance" through the production of "a new autonomous life that is, however paradoxically, complete in itself and immanently meaningful: the life of the problematic individual" (78). Hence, also, the fact that the novel "tends to unfold its full epic totality only within that span of life which is essential to it" (81). In addition to Gallagher's essentially prolegomenal work on this issue, recent interdisciplinary studies of science and literature have remarkable findings. Nicolas Pethes, for one, writes, in "Telling Cases: Writing against Genre in Medicine and Literature" of the shift away from *bildungsroman* and "Strange Case of..." tales as literary realism increasingly "mirrors the fact that modern societies do not consider human beings as interesting individual cases anymore but rather as elements of average case series" (40). That is, tales about strange, outlying individuals like a sleep-walker or a bilquist in the novels of Charles Brockden Brown give way to the logic inherent of both Howells's *A Modern Instance* and Crane's *Maggie*, in which the narrator is

regionalist fiction, and therefore Jewett, is its focus on the evidentiary or evocative power of “the individual” in encounters of the American mainstream and its peripheries. For exactly this reason, Philip Joseph wants “to reclaim regionalism as a valuable object of study”—regionalism, like valuable literature “recognizes the limitations of one’s judgments and rethinks them accordingly” (16-17). The best of regionalist fiction achieves, in Joseph’s words, “Self-placement—the process by which a subject defines herself in relation to something other...offering rational assessments of motivation and action only to unsettle those assessments through the introduction of another character or another authorial viewpoint,” which I will further explore in my reading of *Deephaven*, below (17). Jewett, makes the question of the individual palpably problematic, since to be valuable in the regionalist frame, the individual needs to have both regular—statistically ordinary—and evocative—artistically exemplary—qualities.

Where to locate Jewett’s fiction in the critical contexts of her day and ours has been a recurrent question in Jewett studies, at least since the 1980s. Jewett has been read for her responses, explicit and implicit, to feminist, Marxist, psychoanalytic, and ecological questions. However, the tendency to put Jewett on one side of either/or debates (is she feminist or not?) proves unsatisfying to anyone, who, like Louis A. Renza, encounters Jewett’s writing as a minor literature, or a literature of withdrawal.¹⁹ A current permutation of this reading of Jewett focuses

not exclaiming (“How remarkable!”) but explaining (“This is what such people must be like; this is how such instances come about”). These examples are mine, not those of Pethes, who focuses on German fiction.

¹⁹ Renza, in *"A White Heron" and the Question of Minor Literature*, holds that Jewett’s writing frequently "withdraws not only from the social ramifications of the topoi associated with regionalist writing, but also from the region of 'regionalist' writing itself and/or its possible ideological perspectives" (67). Richard Cary anticipates Renza’s assessment when, describing Jewett’s treatment of place, he argues that "more prevalent than any other is the mood of withdrawal" (61). Marjorie Pryse, in "I Was Country When Country Wasn't Cool!: Regionalizing the Modern in Jewett's *A Country Doctor*," reads Nan as a hybrid, in Latour's sense, and *A Country Doctor* as a novel that moves "back and forth across the apparent borders that separate country from city, the regional from the modern, the nineteenth from the twentieth century, but in such a way as to suggest that far from escaping the

on the spinster as a figure in Jewett's fiction that places it outside binary politics.²⁰ Jewett could, in fact, be scoured for other such figures, like the widow, the asexual bachelor, and the aging sailor with tales of supernatural occurrences. As Renza suggests, a most telling element of Jewett's fiction is its frequent insistence, so easily elided, on indefinite articles: "A White Heron," *A Country Doctor* that, as Moretti has suggested in another context, highlights the exceptional, overlooked, or emergent qualities of such a titular figure.²¹ Moving from her earliest writing, such as "Protoplasm and House-Cleaning," through her letters, to her superlative treatment of the individual as document in *A Country Doctor*, we will see that Jewett takes care to meditate on the very curiosity or remarkability of such characters and the knowledge they impart about society as a whole. As Richard Cary writes, Jewett's "insights are products of experience simultaneously felt and objectified;" these insights frequently bear consequences for the subjectivity and objectivity of narrator and narration alike (61).

In "Protoplasm and House-Cleaning," to demonstrate the social wholeness that transcends individual experience, Jewett takes up the position of an outside observer. With a tone

'country,' concepts of the modern themselves owe much to regional constructions" (217). Ideologically kindred to Cary and Renza's assessments, Pryse's reading also makes way for those of Hsu and Storey, mentioned above. Readings in this spirit—of Jewett's both/and, neither/nor contestation of genre and narrative convention—continue in works like Melissa J. Homestead and Terry Heller's "'The Other One': An Unpublished Chapter of Sarah Orne Jewett's *The Country of the Pointed Firs*" which examines the unpublished piece to evidence that Jewett's "deployment of some of the generic and thematic conventions of late nineteenth-century regionalism was neither uncritical nor unresisting" (347). Donovan's indispensable "Jewett and Swedenborg" also deserves mention in this context, though I will return to it later.

²⁰ This is the thesis of Sarah Ensor's "Spinster Ecology: Rachel Carson, Sarah Orne Jewett, and Nonreproductive Futurity."

²¹ Renza's insight complements Franco Moretti's similar reading in "Style, Inc. Reflections on Seven Thousand Titles (British Novels, 1740-1850)," Moretti, glossing Harald Weinrich, argues that titles with definite articles look "backward" to something already familiar while indefinite articles alert the reader to look forward to something unknown, surprising, forthcoming:

A Girton Girl, A Hard Woman, A Mummer's Wife, A Domestic Experiment, A Daughter of Today, A Semi-detached Marriage: what the [indefinite] article says is that we are encountering all these figures for the first time; we think we know what daughters and wives are, but we actually don't, and must understand them afresh. The [indefinite] article announces the novel as a challenge to received knowledge. (154)

at turns sarcastic and philosophical, Jewett considers spring cleaning as a pinnacle of civilizational progress, her title meant to remind the reader of “the wide distance between the two points, of departure and attainment” (3) She comically suggests that those who feel cleaning house to be a burden can run away with the Gypsies and enjoy a life free from pointless domesticity. Critiquing the apparent pointlessness of a social practice is exactly her point, which she then applies to the development of medical science and the building of a hospital: neither are complete, nor will they be complete in the lifetimes of her readers. Realizing as much has relevance to both those who resist change and those who mock change because it doesn’t quite deliver what it promises. To give this argument its mock-philosophical force, Jewett takes up the position of an outside observer, specifically, in this case a historian. She examines spring cleaning as not just another domestic activity, but “the reign of an idea to which every other interest and occupation must bow” (3). And this creates a problem of objectivity for Jewett:

It is reckoned almost useless to attempt writing the history of one’s own age while one is sure to be influenced by some of its conflicting prejudices, and so incapacitated from seeing the whole ground. It is hard, even after centuries have gone by, to be impartial, and avoid the danger of being one-sided. (3)

Thankfully, Jewett will be able to objectively assess this phenomenon since “some of the best histories have been written by men who were foreigners to the country of which they wrote” and, she qualifies as one of these, since, she concludes, “the spring cleaning of my house is over with, and I did not help” (3). Jewett here adopts the stance of a social scientist, if only ironically, since reporting on spring cleaning as a social phenomenon excuses her not taking part.

This sociological gesture takes on an ethnographic prerogative reflected in a shift in Jewett’s prose from narration to description. The broadly sociological gesture takes on a

specifically ethnographic prerogative when she turns her attention to the Gypsies. This encounter ought to appeal to each of us in the spring-cleaning tribe, she explains later, since “each of us has some peculiar grievance” with our domesticity that “would lead us, if more were said, to meditate with interest upon the ancient pastoral life” (3). So we should note the transition from chaotic domesticity to “ancient pastoral life” in this passage:

I was driving to-day, and met a cheerful company of gypsies. I had left the room where my favorite corner is, in a state of chaos that was wholly undesirable. My attention had been called to a stack of my books, and other possessions, waiting for me to carry them away to some less convenient place than my desk or chair, and I fled to the highways. Those lucky gypsies! They live in wagons without springs; they are unenviable in some other particulars; but their years go smoothly round, their housekeeping is uniform, and unbroken by any such catastrophes as are ever looming up before us. There was a woman seated upon a pile of hay and dirty looking bundles, and smoking a long clay pipe; there were two dear little dogs sound asleep at her feet, and a child leaned over the side of the wagon, dragging a forlorn shaker bonnet by its only string. The lord of the wagon-hold was taking gentle exercise by the side of the lazy horse, and some older children ran ahead to a farmhouse with a pail and a basket. That woman had no cellar and no closets; her carpet of green grass sprinkled with dandelions has not needed taking up. (3)

The passage shifts not only from Jewett and her home to the Gypsies, but also from narration to description. At first, Jewett “was driving” because she “had left the room” where her “attention had been called” to a mess and so she “fled,” only to encounter the Gypsies. At this point action-oriented narration gives way to a remarkably more languid description of the wagon folk’s lifestyle. In contrast to the chaotic activity of Jewett, the Gypsy “years go smoothly round,” a

woman lazily smokes, dogs sleep, children “lean” and “drag,” and “the lord of the wagon-hold” does “gentle exercise by the side of the lazy horse.” The contrast, though specifically of a hectic lifestyle to a relaxed one, more generally applies in both directions. That is, apprehending the distinctness—and, more importantly, the succinctness— of the pastoral Gypsy way of life should similarly suggest that we, Jewett’s co-observers, too have a way of life that is distinguishable from others and possessing finite qualities. A Gypsy Jewett would be equally capable of describing us from the outside just as Jewett does with the Gypsies, in which case we will have features (our years don’t go smoothly round) rather than stories (Jewett flees house cleaning).

Any society, at any moment, has these meta-characteristics of distinctness, succinctness, and wholeness that can be compared to that of others to yield insights about social development. Jewett, in fact, clarifies as much for her readers, stating, “here I am thinking of the disadvantages of our position; the general disadvantages, not those of the present state of housekeeping alone” (3). For Jewett, whatever is distinguished by “we” is always more or less—and again, succinctly and distinctly—in the middle. On one hand: “We so much more readily accept the good old things that were established by our predecessors, than the new”; on the other: “who can help feeling we are somewhat defrauded, when he thinks of the greater advantages which will belong to the day of those who will live after us, for which our day is the starting point?” (3). Jewett then pronounces her sociological thesis²²: “in all times and acts there is both a beginning and an

²² What she doesn’t pronounce, but nonetheless lies in the subtext of “Protoplasm,” as it does in much of Jewett’s writing is the sense that an escape—or at least a freedom—from traditional feminine domesticity allows her to become a sociologist, as it allows the traveler-narrators of *Deephaven* and *Country of the Pointed Firs* to become ethnographers and Nan Prince to become the eponymous country doctor. Jean Carwile Masteller, in “The Women Doctors of Howells, Phelps, and Jewett: the Conflict of Marriage and Career,” points to the originality of Jewett’s *A Country Doctor*, despite the closeness of her novel to those of Howells and Phelps:

Jewett created a sympathetic portrait of a strong, capable woman doctor genuinely dedicated to her profession, but, like many reviewers of *A Country Doctor*, Jewett questions the possibility of a woman’s combining her medical profession with married life. Furthermore, she argues that not all women, apparently including herself, are suited for marriage. She does not suggest that just any woman should

ending; there is a completion, and the germ of something afterwards to be completed.” From some protoplasm we have moved on to house cleaning, which will itself one day prove to have been the protoplasm of something else (the periodic defragmentation of physical memory on a hard disk, perhaps).

Some seventeen years later, Jewett considers these matters again, now in the idiom of the ethics and aesthetics of fiction. In a letter to Anne Fields, dated Saturday, October 12, 1890, Jewett responds enthusiastically to Flaubert’s *Madame Bovary*. She writes “about dwelling upon trivialities and commonplaces in life:”

A master writer gives everything weight, and makes you feel the distinction and importance of it, and count it upon the right or the wrong side of a life’s account. That is one reason why writing about simple country people takes time and thought. [...]

Flaubert, who sees so far into the shadows of life, may “dwell” and analyze and reflect as much as he pleases with the trivial things of life; the woes of Hamlet absorb our thoughts no more than the silly wavering gait of this Madame Bovary, who is uninteresting, ill-bred, and without the attraction of rural surroundings. But the very great pathos of the book to me, is not the sin of her, but the thought, all the time, if she could have had a little brightness and prettiness of taste in the dull doctor, if she could have taken what there was in that dull little village! She is such a lesson to dwellers in country towns, who drift out of relation to their surroundings, not only social, but the very companionships of nature, unknown to them. (82-83)

reject marriage and become a professional; but for those women like Nan Prince, whose exceptional talents are repeatedly emphasized, a career is the more appropriate choice. (140-141) Similarly, Baym argues that *A Country Doctor* “presents doctoring as a profession suited to a type of woman who is now appearing in large numbers, as the century wanes and 'civilization' (Jewett's iterated word) advances beyond the need to dedicate all women exclusively to procreative purposes. Contesting stereotypes about womanhood, Jewett shows that this new type, although essentially unsuited for marriage and motherhood, is also an evolutionary advance” (188).

This passage makes a complex connection of “trivialities and commonplaces” to “distinction and importance.” The key word here is dwelling. “Dwelling upon trivialities,” which Flaubert does in such a profound way as to make “the silly wavering gait” of the “uninteresting, ill-bred” Emma Bovary as absorbing as Hamlet, can result in a clear “lesson to dwellers in country towns” of the peril of “drift[ing] out of relation to their surroundings.” Through this example, Jewett relates the moral value of fiction (the “lesson” that ought to “absorb our thoughts”) to the evidentiary value of details, and, moreover, how these details make individual human cases intelligible as exemplars of social contexts: a Madame Bovary can be an example to all country dwellers.

It is this last proposition— that Emma Bovary is “a lesson to dwellers in country towns”—that suggests Jewett’s challenge to the social thought of her time. Even if she valorizes the “outsider” perspective, in both documents, the letter above and “Protoplasm,” Jewett suggests that we need to know ourselves, that depictions of country life would be most instructive to denizens of the country. While Porter reminds us that “objectivity names a set of strategies for dealing with distance and distrust”, Jewett focuses her writerly powers on a similar type of observation to address the growing disassociation of these dwellers from their dwelling places (*Trust in Numbers* ix). This is perhaps the paramount political truth of the use of quantification –in whatever institutional context. That is to say, quantification, is an exercise of power, à la Foucault, that belies both strength and weakness, expressing “a response to conditions of distrust attending the absence of a secure and autonomous community” (xi).²³

²³ Hence, Porter’s reversal of the arrow, referred to above. The rise of quantification was not due to “the attempts of powerful insiders to make better decisions, but rather emerged as a strategy of impersonality in response to their exposure to pressures from outside” (*Trust in Numbers* xi). It is in such a spirit that Nancy Bentley, in *Frantic Panoramas*, points out that Chesnutt used “dialect and...literary representation of the South,” filtered through the frame of a Northern narrator, to achieve “intellectual mastery of the region that was the ‘northern mind’ (192). Or conversely, that women local colorists faced a kind of aesthetic distrust from the literary establishment: The same virtues that earned them the status of artists—their skilled observation of distinct local cultures, their deftness of narrative touch in crafting shorter forms—also permitted the male literary establishment to conceive of their work as belonging to a feminine aesthetic distinguished from a broader literary mastery...the islands of rural

Though scientists, bureaucrats, businessmen, or economists might like to represent quantification as a sign of their disciplinary or practical integrity, it can just as well—perhaps, more accurately, even—be a sign of a science’s permeability, heterogeneity, or need to respond to what lies beyond its boundaries.

Jewett’s confrontation of this “distance and distrust”—but also “interest” and “curiosity”—permeates her writing in the form of “human documents.”²⁴ A subtle philosopher of the value of these human documents, Jewett pens the general introduction, in 1893, to a recurring feature of *McClure’s* magazine bearing the same title. Jewett therein handles the potentially impolite, if not absurd, procedure of turning a human into a document for the purpose of exposing it to “public demand”—problematically, “a sincere man willingly answers any questions, however personal, that are asked out of interest, but instantly resents those that have their impulse in curiosity” (“Human Documents”).²⁵ She assures readers that there will be both

life and the shorter narrative forms that characterize their work set them apart from the realists who wrote with ambitions for large sociological reach. (128)

²⁴ In his study, Cary catalogs Jewett’s reading of Stern, Fielding, Smollett, and Cervantes—all supposedly guided by her father—though “she seemed more amenable to Jane Austen, George Eliot, and Mrs. Oliphant” (21). Cary also lists Milton, Dr. Johnson, Arnold, Tennyson, Emerson, Lowell, Zola, Montaigne, Balzac, Flaubert, Tolstoi, and Turgenev as authors Jewett was familiar with. The language of “human documents” certainly has the ring of a Zolaesque commitment to experimental fiction. Donovan, for her part, finds evidence that Jewett “explicitly rejected the naturalist theory offered by Emile Zola, who carried the notion of artistic objectivity much further than Jewett found acceptable” (“Sarah Orne Jewett’s Critical Theory: Notes toward a Feminine Literary Mode” 215). As evidence, Donovan cites a letter in which, “speaking with enthusiasm...of Thackeray’s *Vanity Fair* (one of her favorite works) Jewett noted how ‘full [it is] of splendid scorn for meanness and wickedness, which the Zola school seems to lack’ (qtd. in Donovan 215). Yet, reading Jewett’s words of introduction to the *McClure’s* feature, a reader certainly wouldn’t be excessive in concluding it was Zola’s lack of judgment rather than his methodology she rejected.

²⁵ Such language might be fruitfully compared to Howells’s reflections on journalistic ethos by way of the exploits of Bartley Hubbard’s writing for the “Solid Men” series of the fictional Boston paper, *The Events*, in *The Rise of Silas Lapham* and *A Modern Instance*. Here is a particularly noteworthy passage from the latter in which the editor, Witherby, and Bartley exchange their views on interviewing:

“Oh, by the way,” said Witherby, “there is one little piece of outside work which I should like you to finish up for us; and we’ll agree upon something extra for it, if you wish. I mean our Solid Men series. I don’t know whether you’ve noticed the series in the Events?”

“Yes,” said Bartley, “I have.”

“Well, then, you know what they are. They consist of interviews—guarded and inoffensive as respects the sanctity of private life—with our leading manufacturers and merchant princes at their places of business

moral and scientific value in the portraits that will appear in the feature, offering a list of all that may be read “in any Human Document”: “the look of race, the look of family, the look that is set like a seal by a man’s occupation, the look of the spirit’s free or hindered life, and success or failure in the pursuit of goodness” (“Human Documents”). “If we could read one human face aright,” she suggests, “the history not only of the man, but of humanity itself, is written there” (“Human Documents”). Her fictions likewise exploit the value and record the problems of human documents, while always aware of the “distance and distrust” of those who might inspect such documents.

How is the individual, taken as an element in a set of data, meaningful? This question touches upon problems for representation, cognition, and representation—or, as in Desrosières account, problems of encoding and formatting. In fiction and nonfiction, Jewett approaches these problems directly, not only at the more esoteric level of symbolic expression. Jewett makes no apparent collaborations, professional or amateur, with the world of nineteenth century science²⁶ and it remains controversial whether the substantial differences between the numerical (if not scientific) treatment of data and the descriptive (if not artistic) treatment of material amount to irreconcilably divided domains of inquiry. In any case, Jewett’s direct treatment of this question should strike us as scientifically relevant, just as the science of her time is relevant to her fiction.

and their residences, and include a description of these, and some account of the lives of the different subjects.”

“Yes, I have seen them,” said Bartley. “I’ve noticed the general plan.”

“You know that Mr. Clayton has been doing them. He made them a popular feature. The parties themselves were very much pleased with them.”

“Oh, people are always tickled to be interviewed,” said Bartley. “I know they put on airs about it, and go round complaining to each other about the violation of confidence, and so on; but they all like it.” (*A Modern Instance* 197)

²⁶ Though it would be hard, following Baym, not to read Jewett as an affiliationist—a women writer of the nineteenth century interested in, but not directly producing, science. Jewett’s role-modelling on her country doctor father, and the impact this was to have on her sense of writing as vocation is well known.

Deephaven (1877)—especially in the Captain Sands episode—depicts the complex intersections of outsider observation, insider experience, and exemplary instances. Jewett’s first published novel, *Deephaven* chronicles two Bostonian friends’ growing comfort and familiarity with the titular sleepy, economically depressed, and—to some—culturally backward Maine fishing village. The two summer visitors from Boston, Helen Denis and Kate Lancaster—both twenty-four years old—take up residence in Kate’s deceased great-aunt’s house. About midway through the narrative, readers (along with Helen and Kate) are treated with the musings of one Captain Sands, who comes upon the girls fishing and offers to take them out to his own preferred fishing spot. As they row, he comments on the weather, making some predictions moving comfortably between technical and rustic terminology, with terms like “apogee” and “perigee” contrast with the more experienced and esoteric seafaring ways understood by Sands and his “gran’ther.” As the day wears on, the tourists learn about Captain Sands’ premonitions of the weather, which, he maintains, are “impressed” on his mind by his wife. “Our house sets high,” he explains, “and she watches the sky” (93). The captain relays a number of such stories in which loved ones transmit or “impress” urgent messages, sometimes across great distances. When Kate asks him flat out if he thinks his wife truly “made [him] know” about a coming storm his answer frames the matter of folk science versus official science: “It ain’t for us to say what we do know or don’t, for there’s nothing sartain, but I made up my mind long ago that there’s something about these p’intns that’s myster’ous” (95). He is certain that ““we’ve got some way of sending our thought like a bullet goes out of a gun” (96).

Captain Sands provides a poignant metaphor for the boundary between the known and the unknown and the potential of the human mind for such paranormal feats:

“It makes me think o’ them little black polliwogs that turns into frogs in the fresh-water puddles in the ma’sh. There’s a time before their tails drop off and their legs have sprouted out, when they don’t get any use o’ their legs, and I dare say they’re in their way consider’ble; but after they get to be frogs they find out what they’re for without no kind of trouble.” (97)

This could be dismissed by our narrator as the backwardness or ignorance or superstition of a rustic. Likewise a reader might wink, knowing that the author offers images of bygone modes of thought to add to the authenticity of her local color. We might sense some tongue in cheek when Helen somewhat dismissively employs a sailing metaphor, reporting that “the captain was under full sail on what we had heard was his pet subject.” And yet, Helen also reports that “it was a great satisfaction to listen to what he had to say.” Moreover:

It loses a great deal in being written, for the old sailor’s voice and gestures and thorough earnestness all carried no little persuasion. And it was impossible not to be sure that he know more than people usually do about these mysteries in which he delighted. (97)

The fact that others have already warned the tourists about Captain Sands’ “pet subject” lends an ironic tinge to the “satisfaction” of listening and the impression of the speaker’s “earnestness.” Yet, Helen can be observed here attempting to dispel the reader’s distance and distrust, along with her own, by way of the richness and vividness of Captain Sands as a human document, hence the apologetic emphasis on the “sailor’s voice and gestures.” The tangled litotes of “impossible not to be sure” would add to the documentary subtext, urging, perhaps, further study—or travel to the country to meet Captain Sands for ourselves. The Jewett of “Human Documents” seems to suggest that any example will do, that to read “one human face aright” would mean to read the whole history of mankind. This seems to be what the Jewett of

“Protoplasm and House Cleaning” does by way of reading “the face,” as it were, of the Gypsy caravan. But the treatment of Captain Sands through the one-step remove of a narrator, whose status herself is liminal, since she is closest friend of one who has family roots in Deephaven, belies something more complicated, perhaps as Cary says: “experience simultaneously felt and objectified” (61). The end of the Captain Sands episode emphasizes the strange fact that there are almost two narrators of *Deephaven*.

Through the different positions of Kate and Helen, Jewett depicts “subjective” and “objective” responses to the “human document.” After Helen’s more or less approving documentation of Captain Sands, the chapter concludes with “a long talk about the captain’s stories and these mysterious powers of which we know so little”—which Helen notes was a particularly memorable talk for her. Kate, for her part, is resolute, saying that ““we have these instincts which defy all our wisdom and for which we never can frame any laws”“ and indicating that ““the mystery of this world may be the commonplace of the next”“ (103). Helen, then, perhaps more discerning in her rhetoric, offers an explanation that recalls Crèvecoeur, Emerson, and perhaps even Swedenborg.²⁷ She says of “simple country people”:

“In their simple life they take their instincts for truths, and perhaps they are not always so far wrong as we imagine. Because they are so instinctive and unreasoning they may have a more complete sympathy with Nature, and may hear her voices when wiser ears are deaf. They have much in common, after all, with the plants which grow up out of the ground and the wild creatures which depend upon their instincts wholly.” (104)

²⁷ Josephine Donovan has made a comprehensive case for the impact of Swedenborg on the life and writing of Jewett, through the mediating figure of Harvard law professor, Theophilus Parsons. This would be a palpable moment of such influence—as is much of the discussion of spiritual calling in *A Country Doctor*. See “Jewett and Swedenborg” additional, but brief, discussion of which will be found below.

Kate, closer to Deephaven, remains comfortable with her more mystical, less scientific formulation, which notably doesn't create an "us" and a "them"—she needs no "human document." Conversely, the "we" to which Helen belongs when she imagines the plant-like simple country folk with their instinctive knowledge is the "we" of Boston, the "we" that might attend college and attain the perspicuity of state-of-the-art empirical science, the "we" who send a hunter in search of a dead white heron in Jewett's most anthologized tale, "A White Heron." Similar ideas will be expressed by rigorously trained and long practicing medical doctors, who reprise a remarkably similar conversation in *A Country Doctor* (1884) to which I will return below. It suffices now to recognize Kate and Helen, in their responses to Captain Sands, at least, as cognate to subjective and objective responses, respectively, to this example, case, human document, or whatever else we may label him.

Jewett's invocation of a subjective/objective split marks Jewett's conceptual participation in the development of statistical social science. Josephine Donovan has compellingly argued that Jewett moves beyond that formal-historical binary of American fiction which figures the replacement of the antebellum Swedenborgian-Emersonian style of metaphor by the postbellum realist use of metonymy as secular, representational, and cartographical tool. Jewett moves beyond this binary with "an animistic theory of nature" in which "the literal or the natural is itself significant; it speaks its own language, which humans must seek to hear—not erase through their own symbolic code" (742). Likewise, Sarah Ensor argues that Jewett proposes a type of "spinster ecology," offering "the figure of the spinster" as "an avuncular form of stewardship, tending the future without contributing directly to it" as a viable alternative to the adversarial binary of heteronormative and queer responses to problems of sustainability and futurity (409). In both of these cases, Jewett figuratively denotes and resolves a problem in

representation. To note Jewett's awareness of the potentially divergent cognitions of her material (again: subjective or objective) means to make the subtlety and innovation central to Jewett's contemporary literary reputation, as evoked by scholars like Donovan and Ensor, active in the realm of fact and science as well as the realm of symbol and art.

People as Social Facts as Things

The rise of data-driven social science in the US is accompanied by dissenting pleas on behalf of activist progressivism—of which I have more to say in the next chapter. The rise of social science, driven by number, is one facet of a larger shift from a theoretical to a descriptive approach to scientific inquiry. Let's return to Durkheim's fundamental rule: "Consider social facts as things." This formulation is a relatively late, turn of the twentieth century reappearance of a much earlier problem among French scientists and mathematicians like Adolphe Quetelet and Claude Bernard, who debated whether the goal of science (and therefore social science) was to merely describe or fully explain phenomena, in the early decades of the nineteenth.²⁸ The consensus that arose from these debates has clear consequences for the understanding of realism in fiction, and—eventually—regionalism in Jewett. While it might be evocative or provocative (take your pick) to venture explanations of natural phenomena, whether through numerical or verbal language, and while verbal descriptions might have usefulness as such, the only objective, communicable, repeatable truths consist of numerical description. In this way, the growth of the social sciences in the nineteenth century contributed to the codification of objectivity, or as Desrosières glosses it, "making things that hold," as an essential component of scientific method (9). For Desrosières, as well as other historians of nineteenth century science, this drive ties together the contemporary (nineteenth century) conflict between "description and management"

²⁸ Straying well into *longue-durée* territory, Desrosières has a detailed account of how the nineteenth century problem is itself reappearance, for mathematicians, of the medieval debate of nominalism.

and today's conflict between the "internalist" view of scientific development that conceives of a linear growth of knowledge and the "externalist" view that gives priority to the social conditions under which knowledge is constructed. In both conflicts, "the development...of technical and social forms" is at stake (8-9).

Debate over the value of human testimony evidences this shift in a way that compliments Jewett's similarly emergent sense (from 1873's "Protoplasm" to 1893's "Human Documents") of how individuals "read aright" exemplify or testify to the realities of social life. "Human testimony comes from the human brain": so pronounces George Miller Beard in his three-part *Popular Science* article, "The Scientific Study of Human Testimony." Consequently, "the scientific study of human testimony is only possible through a knowledge of the human brain in health and disease, and is therefore a department of cerebro-physiology and pathology" (55). Human testimony, he concludes over the course of the study, is only scientifically accurate when coming from an expert, a term which Beard duly qualifies. From this it follows that brain-experts are the only experts fit to give testimony on human testimony itself. Beard's work was likely echoing that of William Benjamin Carpenter, whose essay, "On Fallacies of Testimony Respecting the Supernatural," had been reprinted (from the pages in England's *Contemporary Review*) in *Popular Science* two years before. Both authors sought scientifically disciplined responses to the era's wealth of first-hand testimony on supernatural phenomena. The meticulous conditions for expertise, classification of types of claims, and consequent judgement of adequate quantity and quality of evidence—all laid out by Beard in his essay, and certainly developed by others elsewhere—anticipated the (construction of the) expertise of later decades' social scientists—if, that is, such work didn't actively prepare their appearance.

At the same time as professional scientists were assessing the proper treatment of “human test subjects”—a term that comes up several times in Beard’s essay—policy makers and public intellectuals began to aim scientific expertise at social problems, or, what amounted to the same thing, they redefined social problems in scientific terms, moving from questions of how to collect and aggregate data from individuals toward questions of how to use this data to administer public policy. In “The Public Health,” an 1878 article appearing in the *North American Review*, Elisha Harris, writing in his role as president of the American Public Health Association highlights the role that policy and municipal authority has played and must continue to play in the health of the public. Harris makes an argument for the coherence of the very concept of “public health,” one which today we very much take for granted, but that Harris’s rhetoric admits as provisional (even if he is a confident proponent). A most important datum for Harris is death rate: at least twice, he mentions the enviably low death rate of London. Significantly, data collection is only half of the formula of publicly-administered care he calls for—the other half being policy. A biological agent might be responsible for disease itself, but for Harris lack of public health policy and procedure effectively becomes a social ally of the biological. He argues that “pestilential epidemics” and “excessive death-rates” demonstrate another threat, “the perilous presence of various conditions, both material and governmental or social, which tend to the pauperizing, enfeebling, general harm, and decivilization, of the people” (446-447). So runs Harris’s passionate description of the nexus of epidemiological, administrative, and statistical sciences; as Beniger or Trachtenberg might underscore—and as Jewett herself will critique in *A Country Doctor*, we can see humanist *ministry* disappearing, in favor of bureaucratic *administration*.²⁹

²⁹ Such is central to Baym’s reading of the novel to which I’ve already referred. Baym places high importance on the fact that Jewett’s version of doctoring (by way of Dr. Leslie and protégé Nan Prince) is not that of cutting-edge,

In the 1870s, the US gets its first psychology laboratories (“psychology” would eventually stick as name where Beard’s clunker, “cerebro-physiology and pathology,” didn’t), with a total of eighteen existing by 1882. Columbia starts a graduate program in political science in 1880 and University of Chicago establishes the world’s first sociology department around the same time. Professional associations and journals explode during this period. The social sciences were tools to solve problems conceived by the bourgeoisie and “The United States was ‘bourgeois’ from the beginning”: whether the problem was rapidity and incoherence of urbanization, the broadening and deepening waves of immigration, the dynamics of race, or the waxing specter of class war, there was a broad American consensus that “there was nothing wrong with [the] country’s basic institutions and that, accordingly, ‘problems’ could be dealt with in a piecemeal, ameliorative fashion. But of course, this was exactly the ideology of a technocratic social science” (Manicas 210-211). Problems needed to be solved through exact, scientific study which, in its course, would require that “professionals with legitimate claims to authority and autonomy...mark out their own scientific territory and establish their own system of credentialing.” In short: “they must constitute disciplines” (211). Manicas reminds us of two important caveats here. First, these developments were rapid, but not instantaneous, as this gloss

research-oriented hard science, but rather something like artisanal community healing: "*A Country Doctor* attacks modern medicine as a materialist, competitive, faddish, theory-driven, status-hungry departure from the pastoral ideal of the doctor as counselor, confessor, and spiritual healer," Baym writes (189). This might even mean that Jewett's view of "modern medicine" partakes of Twain and Warner's critique of speculativeness as I present it in chapter two. Jewett, or, at least, her doctors, see modern medicine as relatively unconcerned with deep understanding and disciplined application—and more concerned with speculating upon discovery—what might be achieved, what might be understood, what might lie around the corner. Adventuring with theory is the glitzy, gilded thing, whereas the labor, based on descriptive familiarity, is the base metal that we should rely on. Hence, I don't exactly agree with Baym's final word: "Although she is an advanced variety of the species woman, Nan turns the clock back on scientific medicine" since "she will strengthen the [women's] college and the profession [of medicine] by her high moral purpose, thus restoring values that scientific medicine is abandoning" (191). Of course, steeped in today's concerns about reproductive rights, there is a simple progression to be critiqued here (as Baym does by invoking Dr. Leslie's relief that Nan and fellow students are not growing into abortionists—signified by way of euphemism; Baym would likely prefer a Jewett who provided a hopeful assessment of these same abortionists), I would rather read any “turning back the clock” on Jewett's part as the endorsement of a contemporary alternative. Not retrograde: contemporary.

might make them seem. Furthermore, the above description is not of a cynical movement bent on “depoliticiz[ing] the new problems,” though this was arguably a byproduct of the process. In any case, it was the process that was the intentional movement; tautologically, it was the belief in science as the method by which to address ‘the social question’ that constituted the first flourishing of social science. By such lights, the positivist future prescribed by Comte, even if inflected by way of Spencerian metaphysics, was not far over the horizon. In public forums, experts like Harris were pointing not just to cutting-edge scientific understandings of natural phenomena, like contamination, infection, and disease, they were also pointing to results in the form of numerical data. The ability to do so had—again, provisionally—the effect of reinforcing that broad American consensus of progressive perfection evoked by Manicas. However, not everyone joined this consensus.

Dissenters, like George W. Julian, worried that positivism in social theory replaced an activist sense of “progress” with a passive sense of “development.” Julian finds that the nascent assemblage of social science “tends to confound the distinction between right and wrong” and worse, “it threatens to dethrone conscience, and substitute development for duty” (259). Julian develops a cautionary reading of social Darwinist discourse problematizing its central analogy of biological and social evolution. For the biologist, according to Julian, evolution describes a process that God applies to enact gradual change with a divine and total knowledge of the process, beginning to end (let’s set aside the discussion of whether this is gospel Darwin). Social Darwinism, then, wrongly assigns the knowledge and power of God to human application of similar developmental social intervention (239). In addition to the faulty analogy, Julian also impugns the folly of human actors presuming to abide by divine scales of time. “We cannot...become coadjutors with our Maker,” he scolds, “by folding our hands and waiting upon

evolution, or the cold logic of events.” Rather, we are meant to make our mark “by acting well our appointed part in the fleeting drama of life by plunging into the strifes and struggles of our time, and wisely but fervently toiling for our kind” (240).

To Julian, this perspective implies an erroneous view of history, since “the age we live in is what we find it because of the labors and sacrifices of all the great souls of the past” and “if progress has been evolved, it has also quite as certainly been propagated.” That is, progress is not simply the product of law, but the fruit of human toil and sacrifice, voluntarily embraced for the improvement and regeneration of mankind. Our churches, our educational institutions, our organized charities, our scientific associations, our various special reforms, and that marvelous instrumentality called the press, are all so many testimonies to the power of voluntary efforts purposely employed in the furtherance of human well-being, and so many practical refutations of the theory that social development is dwarfed and deformed by attempts to improve it. (243-244)

Julian, who began with a distinction between evolutionary biology and social Darwinism, eventually strains against that very distinction, decrying the social Darwinist’s condemnation of reformism, lamenting that, according to this view, the reformer “must be put under the training of Science, while Evolution is to have free course and be glorified” (244). Against this apotheosis of science and evolution, Julian offers, enthusiasm, citing Emerson, as “the leaping lightning, not to be measured by the horse-power of the understanding” (244). Julian conjures an image of “real social progress,” driven by “the faculty of imagination” and only ever achieved “by imperfectly aspiring toward a perfect ideal” (244). Anticipating the mechanistic nightmares of literary naturalism (at the time Julian is writing, Frank Norris is eight and Theodore Dreiser only seven years old), Julian warns that “if you destroy this faculty the condition of man will

become as stationary as that of the brutes” (245). Based on Julian’s argument, one could plot all worldviews or theories—whether strictly speaking religious or scientific—on a spectrum from enthusiasm/idealism to understanding/actualism.³⁰ Humanity as such, in Julian’s view, owes its existence to the left side of that spectrum and Julian furthermore suggests that Christianity is the “seed plot” of such enthusiastic idealism, even if there are secular fruitions like the American War of Independence.

While Julian’s plea is polemical, Jewett conducts a calmer exposition of the opposition he invokes between data-driven gradualism and passionate progressivism. For Julian, science, with its calculation, its data, and its gradualism, can perhaps aid development, but it will never lead to moral progress. The latter requires passionate, extraordinary individuals. Jewett, in *A Country Doctor*, looks at a very similar problem, producing the story of one female doctor and her visionary protector-teacher without fully resolving whether it is a novel of social *development* or social *progress*, as Julian might demand of her. Whether the life of Nan Prince is a story, an example, or an experiment—and what the truth value of any of these forms might be—is a conundrum evoked and suspended but never confidently answered by the novel.

Where Do Country Doctors Come From?

Can we do social experiments with individual people? Jewett asks this question with remarkable clarity in *A Country Doctor*. To document this question, the novel follows the precocious Nan Prince from infancy to adulthood. In addition to reporting on Nan as an experiment in the social phenomenon of the female professional/scientist, Jewett’s *A Country Doctor* contemplates the sociologically gradualist frame of “locality.” Nan’s mother flees a failed marriage to collapse and die at her mother’s house, where Nan’s grandmother becomes her guardian. Upon the death of

³⁰ We will see this again when we encounter Anna Julia Cooper’s contribution to the Black Club Movement.

Mrs. Thatcher, a Dr. Leslie takes up the mantle of guardianship as Nan grows into an uncommon intelligence and desire to become a doctor. Nearing adulthood, she visits her paternal aunt and is confronted with the temptation of a suitor and the baseline social disapproval of her prospective career, though she weathers these distractions and follows in Dr. Leslie's footsteps. Treating this novel with Elizabeth Stuart Phelps's *Doctor Zay*, Mark Storey points to various overlaps, intersections, and discontinuities of contending world views, aesthetics, medical philosophies, and geographies evoked by these novels of rural female doctors. While Storey sees the defining tension of such novels as "the need to return to romantic motifs within a literary-historical moment that venerates realism," I find that, for Jewett, the explanatory power of what will come to be called social science is also at question (707).

In a pivotal scene, Dr. Leslie is visited without notice by an old friend, Dr. Ferris, whose itinerant, sea-going lifestyle contrasts to Dr. Leslie's more static country life. The two quickly turn to Nan as a topic of conversation and seemingly take up opposition positions on the social question under consideration: whether women can be doctors. Dr. Leslie lays out his thoughts in a theoretical idiom, as Dr. Ferris is quick to criticize. Dr. Leslie says:

I believe she has grown up as naturally as a plant grows, not having been clipped back or forced in any unnatural direction. If ever a human being were untrammelled and left alone to see what will come of it, it is this child. And I will own I am very much interested to see what will appear later. (212)

Similar to *Deephaven*, this plant metaphor figures Nan as an object of naturalistic, botanical observation—and manipulation, though Leslie claims that lack of gratuitous manipulation is exactly what qualifies Nan for medicine. The self-serving, self-confirming figuration here is not

lost on Dr. Ferris, who responds “with feigned anxiety” by pointing to Leslie’s dilettantish experimentalism:

You surely aren’t going to sacrifice that innocent creature to a theory! I know it’s a theory; last time I was here, you could think of nothing but hypnotism or else the action of belladonna in congestion and inflammation of the brain...I consider it a shocking case of a guardian’s inhumanity. Grown up naturally indeed! I don’t doubt that you supplied her with Bell’s ‘Anatomy’ for a picture-book and made her say over the names of the eight little bones of her wrist, instead of “This little pig went to market.” (212-213)

At this crucial point in the book, when Nan has only just come to live with Dr. Leslie, Dr. Ferris skips past the first order social problem that would seem to be the subject of the novel—whether or not a woman could be called to the medical professional and whether or not such a calling ought to be heeded—to a second order question of social-scientific theory and method. Dr. Ferris implies disbelief in Dr. Leslie’s ability to seek an answer to the first order problem by experiment by calling into question the objective precision of the experiment (was Nan “supplied...with Bell’s ‘Anatomy’ for a picture-book”?).

Remarkably, Dr. Leslie easily satisfies his friend’s methodological objections. The two quickly turn to a third-order social theory, not a question of how to derive social facts, but about how the social as such works, as outlined by Dr. Ferris:

“Most of us are grown in the shapes that society and family preference and prejudice fasten us into, and don’t find out until we are well toward middle life that we should have done a great deal better at something else. Our vocations are likely enough to be illy chosen, since few persons are fit to choose them for us, and we are at the most unreasonable stage of life when we choose them for ourselves. And what the Lord made

some people for, nobody ever can understand; some of us are for use and more are for waste, like the flowers.” (214)

Dr. Ferris continues the plant motif, adding a spiritual angle: on the other-worldly side of the border between knowledge and ignorance is the truth of vocation. This is a hinge point for the conversation—the two doctors take the experiment, Nan, for granted; whether she hears the call or not will be observed by and by—and continue their enthusiastic discourse on “the true gift of doctoring,” which, Ferris observes, Dr. Leslie possesses. Ironically, Ferris praises Dr. Leslie’s commitment to minister to his patients (and this by “intuition”) rather than “investigate a case and treat it as a botanist does a strange flower” (216). Since the conversation has moved on from Nan, the doctors fail to reflect on the botanical treatment she receives. The religious diction continues in ways that very much confirm Donovan’s reading of Jewett as latter-day Swedenborgian:

“You have the true gift for doctoring, you need no medical dictator, and whatever you study and whatever comes to you in the way of instruction simply ministers to your intuition. It grows to be a wonderful second-sight in such a man as you.” (216)

The botanist (above) doesn’t “minister” through “intuition” or “a wonderful second-sight”; he “investigate[s] a case.” Moreover, this botanist does so infrequently and on “strange” (rather than common, salt of the earth, New England) flowers. Dr. Ferris’s crescendo makes all this explicit:

“A man has no right to be a doctor if he doesn’t simply make everything bend to his work of getting sick people well, and of trying to remedy the failures of strength that come from misuse or inheritance or ignorance. The anatomists and the pathologists have their place, but we must look to the living to learn the laws of life, not to the dead.” (216)

The ministerial qualities of the true doctor are emphasized here, and we will learn elsewhere that Dr. Leslie has clergy in his ancestry, so all is in order.

While a number of classic and contemporary (to Jewett, that is) issues of American life are under discussion here—religious sentiment as a frame for authenticity, small town country life as the locus of that authenticity, and the “woman question” as a source of disruption and emblem of modernity—social science, or the amorphous body of social theory that precedes social science, serves as the ultimate frame. Hence the “experiment” or “theory” or “test case” of Nan: if being a doctor is correctly defined as a spiritual calling informed by an organic-intuitive connection to life and healing, and not a matter of collecting facts from books, defining a profession, and attending meetings, investigating cases, and other such urban fare, then her sex is not so problematic.³¹ Nature, or God, calls who it calls. And yet, the allure of the explanatory power of this fallen, post-spiritual science is undeniable, to which one of Dr. Leslie’s concluding metaphors bears witness. “When we let ourselves forget to educate our faith and our spiritual intellects,” he says, “and lose sight of our relation and dependence upon the highest informing strength, we are trying to move our *machinery* by some *inferior motive power*” (218, emphasis added). Though Dr. Leslie’s spiritualizing goes on for a few more paragraphs, he recognizes the fundamental truth value of the language of mechanics and its wholly material world—machines moved by motive power. The two doctors have ended up just where George W. Julian feared they would. In short: Dr. Leslie and Dr. Ferris suggest that, somehow, settling their social

³¹ Pointing to obligatory trips to Boston for the maintenance of Dr. Leslie’s medical expertise, Storey holds that the novel stages an intersection of the rural and the urban in such a way as to challenge this definition of medical practice. I agree that the novel displays this and related ambivalences quite clearly. More significant to me, however, are the framing acts of social description and documentation. See chapter three of Storey’s *Rural Fictions, Urban Realities* for his reading of *A Country Doctor*.

questions in the idiom of science, noting what develops rather than intervening, will settle them best.

Jewett's writing tells stories about the construction of social truth through individual cases—whether these individuals are humans or locales, concerning herself with that which the story of a remarkable individual adds to the construction. Examining Howellsian realism anew, Paul R. Petrie has recently argued that, for Howells, literature was intended to “perform a public role of cultural mediation,” being a “tool for communication across the cultural boundaries” of his day (x). “Aesthetic success” was to be measured “according to the real-world effects of fiction upon...its audience” (x). Petrie reads Jewett as “expand[ing] the range and purposes of Howellsian literary representation” with “an alternative model of reader interaction...that makes room for a spiritualized and mysticized sense of both the bases of local reality and of literary communication” (xii). Petrie himself revives and expands Amy Kaplan's sense of realism's social purpose—“to construct new forms of social cohesiveness” (Kaplan 25). The relation of regionalism and realism remains an unsettled, though not particular divisive, question; more significant is that the social parameters of the two have typically been linked, even as early as Carter's suggestion, in *Howells and the Age of Realism*, that regionalism drives the growth of realism and not the other way around.³² As the case of *Nan Prince* and the case of *A Country Doctor* suggest, Jewett concerns herself with that which *a story about* a remarkable individual actually adds to the “literary communication” of “new forms of social cohesiveness,” if anything at all.

³² See Carter's third chapter, "Towards a Philosophy of Literary Realism," especially pp. 115-117.

Jewett's readers must always be struck by the particularity of the narration, as Renza models at length in his four-fold treatment of "A White Heron." Kate and Helen wind a particular path through *Deephaven*, which Helen, as our narrator, narrates based on her own affective memory rather than the cartographic or chronological qualities of the vacation. The same can be said for the unnamed narrator of *The Country of the Pointed Firs*. Nan Prince, though, is the paradigmatic case—however panoramic the slice of New England life in which her history unfolds, we follow only Nan's path through it. And though the novel's title is *A Country Doctor*, the distinction between two country doctors (Leslie and Prince) will make clear that Nan may not be so much an example as a counter-example. This country doctor may describe what country doctor's may be like, increasingly, from now on, but she is no simple indication of what country doctors "are like" in some static sense.

Perhaps this is what the regionalism within US realism has always indicated: the rich, descriptive study will not leave the region as a static entity, however statistically derived the scene-settings may seem to be. From ephemera like Jewett's "Protoplasm and House-Cleaning," to canonical, anthologized examples of local color like Freeman's "New England Nun" (1891), Harte's "The Luck of Roaring Camp" (1868), and Chesnut's "The Wife of His Youth" (1898), stories of the various regions of the country and the characters to be found therein are typically stories of change, transition, and an internal dynamism that will only appear quaintly static to the superficial reading of outsiders. At the same time, as Jewett indicates in her gloss of *Madame Bovary*, taking these stories in sum will provide a sociological lesson on the meaning of the connection between country "dwellers" and their social life. As Manicas would no doubt remind us, Jewett's most active period, from the late 1870s through the mid-1890s was a time when statistically-derived social theory was more of a speculative future rather than a concrete reality

of scientific accomplishment. Less speculative at first glance—for all the typical Howellsian reasons—Jewett’s regionalist writing points to an acute awareness of the speculative conundrum of finding the truth of a social fabric through the concatenation—or perhaps just concoction—of individual cases. In the next chapter, I will explore how Francis Ellen Watkins Harper, along with other writes of racial uplift, extends this conundrum by contrasting moral and affective certainty with that of science.

5. “Speculation Has Exhausted Itself”: *Iola Leroy*, Social Con/science, and Racial Uplift

In the 1890s, there was plenty to be achieved through involvement in the rise of social science, whether one’s goal was scientific breakthrough, bureaucratic control, professional advancement, or social justice. Motivated by similar concerns, but departing from Jewett’s more agnostic critique of human documentation, Francis Ellen Watkins Harper’s *Iola Leroy* engages the diversity of social thought (scientific and otherwise) inherent in post-Emancipation racial uplift to upset the predominance of a belief-in-science that privileges abstract social aggregates above the lived realities of individuals. While Jewett’s fiction thinks in a basic kind of harmony with social science, offering a critique of “human documentation” from a position favoring something like descriptive objectivity, *Iola Leroy* has a clear intent to upset descriptive social *science* by favoring a social *theory* of uplift and reform heavily inflected by a subjectivist, affective Christian sentimentalism. In *Iola Leroy*, we have one of those “rival forms of explanation...coming from preachers or labor organizers rather than professors” mentioned by Porter in *Trust in Numbers* (6). In fact, *Iola*’s rivalry favors activism in the place of explanation.

African American literature of the 1870s, 80s, and 90s reveals both an internal and an external confrontation with the sciences. The *conversazione* chapter of *Iola Leroy* depicts an internal, multi-perspective debate over the methodologies and aims of African American intellectualism and activism, and promotes a Christian humanist approach to civic achievement in response to those who theorize scientific laws of social life and use them to speculate upon the future of the race. Such internal confrontations with science have received less critical attention than the more exigent and visible confrontation with external scientific racism. Such external conflict, though, is no reason to dismiss the influence of the nascent social sciences on racial uplift discourse. In this chapter, I aim to extend the nuanced, ambidextrous critiques offered by

proponents of black feminist social science, like Patricia Hill Collins and Irma McClaurin, to an earlier period and a different medium, to show, for example, Collins's "outsider within" already at work in the 1890s.¹ By bringing the scientific engagements represented in *Iola Leroy* to the fore and comparing the novel to works of ethnological history and uplift-oriented theories of African-American literature, I contribute a clearer picture of a controversy over the scientific description, measure, and prognostication of social aggregates that has proponents both inside and outside a minority category ("the negro") whose sociopolitical ontology otherwise appears to be imposed upon it from the outside. *Iola Leroy* advances a model, in its titular heroine, of an affective certainty that leads to activism—an activism that connects individual to family to society—and suggests that, for the goal of racial uplift, this affective certainty is more reliable than sociological speculation that would (passively) see the progress of the race as inevitable.²

¹ In *Fighting Words*, Collins gives a genealogy of her use of "outsider within," a term that can denote "the location of people who no longer belong to any one group" or "social locations or border spaces occupied by groups of unequal power" (5). Collins devotes another chapter of her *Fighting Words* to a critique of the construction of objectivity in the sciences and its complicity with racist histories. Yet, she ends the chapter with a caution *against* the implications of Audre Lorde's oft- and too-easily quoted slogan ("The master's tools will never dismantle the master's house" [qtd. in Collins 123]):

Lorde's often-cited quotation tells only part of the story. Although the "master" may have meant for scientific words to be used one way, reclaiming scientific tools and recasting them for different purposes can benefit both science and subordinated groups. Black women's actions within sociology seem to signal such a creative recasting. When it comes to the contributions of sociology to the powerful position that science occupies in the global political economy, relinquishing the "master's tool" of positivist science may be premature and, given the new politics of containment, quite dangerous. (123)

In "Theorizing a Black Feminist Self in Anthropology," McClaurin has a similar critique to offer concerning the postmodern impulse to reject the disciplines thrown into suspicion by deconstructive epistemologies. Rather, McClaurin suggests, black feminism needs the social sciences (in her case, anthropology) to "directly confront...the way in which our identities (always informed by race, class, and gender) are implicated in the research process and in the very way in which we relate to the discipline of anthropology" (57). McClaurin rejects the notion that "the 'native' anthropologist ceases to retain a critical perspective on the hegemonic culture and...loses the ability to identify with the very people from whom she came," instead holding that "[Black feminist anthropologists] construct a complex ethnographic world from our data, our field experiences, our knowledge as 'natives,' halfies, woman, other, that is contradictory, multi-layered, engaged, and as close to representing the social reality of the people we study as we can get" (57).

² *Iola* thus repeats the passionate skepticism, discussed in the previous chapter, of George W. Julian's appeal in "Is the Reformer Any Longer Needed?"—although it is not unthinkable that Julian could have had Harper in mind (among others) when he wrote his 1878 appeal, given that her illustrious career of activism began well before that time.

Since social science was the cutting edge of the sciences at the time of the novel's publication, as has already been explored in the previous chapter, the specific challenge this novel offers to the burgeoning discipline bears exposition. Today's readers need to remember that words like "civilization," "factor," or "measure" are science words in novels written at the time of social science's first flourishing—well before its reclassification as a "soft" science.³ In the postbellum decades, social science acts as both a promise and a kind of trap for racial uplift: to represent, analyze, or in some other way advance a vision of social life out of concern for the individuals who live that life seems to require assent to axioms that distort—or even erase—the integrity of those individuals. While Jewett may evoke this trap in *A Country Doctor* by presenting two contradictory perspectives on Nan Prince (she could be either a natural development or an experimental intervention), the luminaries of the black women's club movement—activist intellectuals like Anna Julia Cooper, Victoria Earle Matthews, and Harper herself—confronted the trap head on, expressing a dissatisfaction with any theory or descriptive science that failed to involve black women as anything other than objects of study lumped in with "the negro" as a social aggregate.⁴ Scientific thought about race in history, ethnology, archaeology, and sociology was productive rather than abhorrent to race workers—it was white supremacist interpretations of this science that were the enemy. At the same time, the most salient fact about the belief-in-science of racial uplift intellectualism, placed in its historical

³ Though I cannot claim the data-crunching prowess of Moretti, a simple "ctrl+f" experiment with the text of *Iola* on Project Gutenberg turns up the following results. "Civilization" appears 25 times throughout the novel, "force" 26 times, and "social," "society," and cognates upwards of 50 times (though this does not rule out potentially misleading cognates like "association"). The term "factor" appears twice, in rapid succession, in the *conversazione* chapter, an appearance which I discuss later in this chapter. Though it might be subtextually deep, "measure," in at least one of its appearances in the text, bears a descriptivist resonance, when Dr. Gresham describes "the negro" as one among many "branch[es] of the human race" who has "outgrown the *measure* of his chains" (my emphasis 225).

⁴ Patricia Hill Collins, surveying a century of the *American Journal of Sociology*, finds "only two articles with titles indicating that they explicitly examine Black women's experiences," one published in 1901, the other in 1973 (98). On a stylistic note brought up by this citation, I will sustain the capitalization and hyphenation of source material when it comes to terms like "black," "African America," "negro," and other terms denoting race.

context, is its staging of the confrontation of Christian humanism with secular science—a long cherished and now repudiated trope of late nineteenth century social experience⁵—as an internal conundrum rather than an external confrontation. To illustrate the internal conundrum, I will highlight the sociological theorizing implicated in *Iola Leroy*, compare this to the scientific parameters of ethnological arguments found in nonfiction by William Wells Brown, Alexander Crummell, and George Washington Williams, and re-situate *Iola* as a fictionalized response to these arguments as well as the arguments for the social power of race literature issued by Cooper and Matthews.

During the flashback sequence that narrates Iola's family history and childhood, Iola's mother—a manumitted slave married to her former owner—laments, “Man is a social being; I've know it to my sorrow” (87). Three years *later* Durkheim will advise prospective sociologists to “consider social facts as things” as the first rule of their method but, as Harper illustrates in her novel, the stubborn thingliness of social facts has long been known to Marie and those in her situation. The flashback further exposit the dissolution of the Leroy family by social forces. The socially deforming effects of Southern plantation life are a continual source of conflict for the Leroy parents, who decide to send young Iola and her brother Harry for education in the North. Marie regrets the fact the children cannot spend vacations at home, lest they compare their isolation in the South to the relative richness of their Northern social lives. For his part, the Leroy patriarch, a white slave-holding farmer “in favor of gradual emancipation,” is buffeted about by “the force of habit, combined with the feebleness of his moral resistance and the nature

⁵ Lisa A. Long, in “Postbellum Physics and Faith in the Work of Elizabeth Stuart Phelps,” dismisses the thesis that a protracted nineteenth century conflict between science and religion lead to the waning of the latter's cultural power as a distortion of that conflict's actual complexity. That there even was such a conflict seems to be the invention of certain noisy pundits and cranky scientists, who began to articulate such a thesis toward the close of the nineteenth century. For a notable American example, we could turn to Cornell University president Andrew Dickson White's *A History of the Warfare of Science with Theology in Christendom* (1896).

of his environment” and, like *Uncle Tom’s Cabin’s* St. Clare, he never acts on time, having “learned to drift where he should have steered, to float with the current instead of nobly breasting the tide.” Leroy is a weak and helpless individual, subjected to the massive, horrible machinations of “a system darkened with the shadow of a million crimes” (86). The children are sent North only to have their father die and their mother’s manumission forfeited. The Civil War breaks out and in its aftermath, Iola joins her efforts to those of so many of the newly emancipated in seeking supportive communities from which to literally reform or reconstruct their families. Iola goes on to be a cherished author and orator of the racial uplift movement. While this is a personal drama for the Leroy family, the social contours of their situation—emancipation, reconstruction, migration—are reflected both in the self-awareness of African-American characters as well as the constant social theorizing from black and white characters alike as to the scientific nature of the phenomena.

The novel expounds sociological theory in a coherent line of argumentation: it simply takes time for a given society to develop from a primitive to a more advanced state. Considering race relations in the light of the Civil War, Dr. Gresham, erstwhile suitor to Iola, holds that “time will bring us changes for the better” despite “the friction of the ligatures which bind...together” white and black Americans (218). He argues to his colleague, Dr. Latrobe, an inveterate racist, that “the negro...is not the only branch of the human race which has been low down in the scale of civilization and freedom, and which has outgrown the measure of his chains,” referring to the “slavery, polygamy, and human sacrifices” “practiced among Europeans in bygone days” (225-226). To those who, like Latrobe, claim that enslavement was necessary to bring Africans out of savagery, Gresham glosses Tyndall’s “Belfast Address”:

Tyndall tells us that out of savages unable to count to the number of their fingers and speaking only a language of nouns and verbs, arise at length our Newtons and Shakespeares, [so] I do not see that the negro could not have learned our language and received our religion without the intervention of ages of slavery. (225)

Several of the male participants in the *conversazione* echo these words. A Mr. Forest marvels “at the slow growth of modern civilization—the ages which have been consumed in reaching our present altitude” and “how we have outgrown slavery, feudalism, and religious persecutions,” basing his optimism for “the future of the race” on this “slow growth” (255). Dr. Latimer, Iola’s eventual husband responds to this, echoing Gresham’s “friction of ligatures,” affirming “the fearful grinding and friction which comes in the course of an adjustment of the new machinery of freedom in the old ruts of slavery” (255). At this point, a difference is introduced: Dr. Latimer’s optimism is specifically Christian. “I am optimistic enough to believe that there will yet be a far higher and better Christian civilization than our country has ever known,” he concludes (255). To emphasize the Christian *ethos*, a Reverend Cantnor ends the conversation, averring that “in that civilization I believe the negro is to be an important factor” (255). As I will show through further attention to the novel and companion texts, this turn to a Christian *ethos* limits the speculative excesses of social science. However scientific may be the role of “factors” in the composition and motion of “civilization,” Christian conviction as both method and goal gives the individual an immediate, active part to play in an arguably more legible drama.

As I’ve already compared her with Durkheim, placing the words of Marie Leroy next to those William Wells Brown further underscores the saliency of social theory that complicates any simple dichotomous antagonism of good humanism and bad science. “Speculation has exhausted itself in trying to account for the Negro’s color, features, and hair, that distinguish him

in such a marked manner from the rest of the human family,” Brown writes, announcing his intent to study “the origin of the African race” (37). In his five-hundred plus page *The Rising Son; Or, the Antecedents and Advancement of the Colored race*, Brown’s framing conviction—and he would be followed by Martin R. Delaney, Alexander Crummell, and George Washington Williams—is that erroneous speculation could only be done away with by producing a “reliable history” constructed from “all the facts” he had “been able to gather upon the subject” (37). To this end, Brown avails himself of a broad spectrum of social science, along with scripture and classical learning—and so today’s readers must not lose sight of the multiple sources of speculation that are often read as one unified viewpoint, scientific racism. In using terms somewhat ambiguously (social “theory” versus social “science”), I want to make the openly problematic gesture of a balance that needs to be struck when reading “the social” in racial uplift.

Racial uplift literature across the second half of the 19th century debates the methodologies and aims of authorship, activism, and social theory to advance a vision of social life and avoid the potential homogenizing, reifying traps of social science. For some, like Brown, who publishes *The Rising Son* in 1874, “the scantiness of materials for a history of the African race” underscores the need for thorough description—Brown “endeavor[s] to give a faithful account of the people and their customs without concealing their faults” (ii). But to Harper, writing at the close of an activist career spanning across four decades, something more is needed than scientific (sociology, ethnological) description: works of literature meant to “awaken in the hearts of our countrymen a stronger sense of justice and a more Christlike humanity” on behalf of a race that “has not had very long to straighten its hands from the hoe, to grasp the pen and wield it as a power for good, and to erect above the ruined auction-block and slave-pen institutions of learning” (282).

“But Iola...what has all this to do with our marriage?”

The novel critiques a series of self-serving exceptions in the (predominantly) white, (overwhelmingly) male field of social theory, as it chronicles the self-empowerment of Iola, which she achieves through a commitment to reform that extends from self to family to community. Though she eventually voices reformist verve on matters of religious devotion and temperance, Iola stands first of all literally for the re-forming of a self, family, and community that has been torn apart by slavery. While she has no problem following the sociological abstractions implied by a history of slavery and reconstruction (decisively punctuated by war), her activism instead subsists on the level of individual, lived reality. There are specific, individual aggressors, racists, family members, and sites involved in her mission to live righteously. One of these individuals, essential as an antagonist in Iola’s empowerment, is Dr. Gresham, a white doctor at a military hospital.

Dr. Gresham, who one chapter title describes as “the mystified doctor,” is “a member of a wealthy and aristocratic family, proud of its lineage, which it could trace through generations of good blood to its ancestral isle” (58). It is likely this good breeding that has him so mystified as he speaks with a colleague, Colonel Robinson, about Iola and her inordinate affection toward black patients. He engages in a flight of vaguely ethnological reasoning, that is the doctor uses social and physical indicators to try to place Iola, and this in order to understand her comportment toward blacks at the hospital:

She is one of the most refined and lady-like women I ever *saw*. I *hear* she is a refugee, but she does not *look like* the other refugees who have come to our camp. Her *accent* is slightly Southern; but her *manner* is Northern. She is self-respecting without being supercilious; quiet, without being dull. Her *voice* is low and sweet, yet at times there are

tones of such passionate tenderness in it that you would think some great sorrow has darkened and overshadowed her life. Without being the least gloomy, *her face* at times is pervaded by an air of inexpressible sadness. *I sometimes watch her* when she is not aware that I am looking at her, and *it seems as if a whole volume was depicted on her countenance*. When she smiles, there is a longing in her eyes which is never satisfied. I cannot understand how a Southern lady, whose education and manners stamp her as a woman of fine culture and good breeding, could consent to occupy the position she so faithfully holds. (57, all emphasis added)

“It is a mystery I cannot solve. Can you?” he finally asks Robinson, who, in turn, has a very simple answer: Iola is a mulatto, and a former slave (57). Harper exploits ironic wordplay in this and many similar passage throughout the novel. Iola, the unsuspected African American still seems like “some great sorrow has darkened and overshadowed her life” and at the same time is not at all “gloomy.” And after hearing of her origins, Gresham will curtly state to Robinson, “What you tell me changes the whole complexion of affairs” (58). Yet, my emphases in the passage point to something that is, we might say, scientifically rather than poetically ironic. The doctor applies a descriptive, observational method to place Iola that can produce nothing but contradictions. Significantly, this is the reader’s introduction to Iola: through a white male gaze baffled by what sees. That bafflement turns to ideological contradiction when Gresham seeks to exclude Iola from their sociological discussion of race relations so that he might marry her.

The probing discussion between Iola and her would-be white suitor brings her self-empowering uplift into tension with his self-serving sociology. This discussion, the first in what deserves to be called a two-part debate over race relations (though the episodes are separated by a hundred pages of novel and corresponding years in the narrative), begins when Gresham

audaciously implies that Iola has been “tried and tempted” by the immorality of slavery. That is, while she may have been raped and seduced, Gresham is completely unlike those who “tried and tempted” her. Iola corrects him directly, explaining that she “was sold from State to State as an article of merchandise” but that she “never fell into the clutches of an owner for whom [she] did not feel the utmost loathing and intensest horror.” More importantly, she requires Gresham to ponder “the vast difference between abasement of condition and degradation of character,” clarifying, “I was abased, but the men who trampled on me were the degraded ones.” Again, Gresham blunders, anticipating the perverse accusations of racism from the #alllivesmatter crowd, pleading, “But, Iola, you must not blame all for what a few have done.” From here they begin to debate the social contours of racism and slavery, Iola holding that “the negro is under a social ban both North and South” and Gresham holding that “slavery drew a line of cleavage in this country” (115).

The question of uplift is not far away, nor is the doctor’s ethnological prognosis, as he urges that African Americans must learn to struggle, labor, and achieve. By facts, not theories, they will be judged in the future. The Anglo-Saxon race is proud, domineering, aggressive, and impatient of a rival, and, as I think, has more capacity for dragging down a weaker race than uplifting it. They have been a conquering and achieving people, marvelous in their triumphs of mind over matter. They have manifested the traits of character which are developed by success and victory. (116)

Iola finds it contradictory that an “achieving people” “has more capacity for dragging down a weaker race than uplifting it” and responds:

I believe the time will come when the civilization of the negro will assume a better phase than you Anglo-Saxons possess. You will prove unworthy of your high vantage ground if you only use your superior ability to victimize feebler races and minister to a selfish greed of gold and a love of domination. (116)

To this, Gresham can only reply, “But, Iola...what has all this to do with our marriage?” (116). She goes on to explain it, of course, but the first bout of the conversation has ended here, since Gresham has demonstrated that his concept of “the social” is abstractly ethnological and hypocritically uninvolved with his conception of himself and Iola as individuals. Or worse: Iola’s sentiments must be verified by Gresham’s sociological preconceptions. In either case, Iola disdains of any self-styled sociologist who can’t deal meaningfully with the social history of the individual who stands before him and talks back.

Some years later, Gresham and Iola, fortuitously reunited, reflect on postbellum political developments. Iola, even less inclined to Gresham’s sociology now, hails the “one remedy by which our nation can recover from the evil entailed upon her by slavery”: “a fuller comprehension of the claims of the Gospel of Jesus Christ, and their application to our national life.” Iola’s uncle, Robert, an interlocutor to this debate, concurs with Iola and quips that “while politicians are...asking what shall we do with the negro...Jesus answered that question nearly two thousand years ago” (216-217). Yet discussion finds its way back to social theory, Iola suggesting the “reckless disregard for human life” of the Jim Crow era, “is more the outgrowth of slavery than any actual hatred of the negro”—a sociological thesis if there ever was one (217). Gresham follows this insight with an unselfconsciously racist one, seemingly blaming blacks for the violence: “The negro came here from the heathenism of Africa; but the young colonies could not take into their early civilization a stream of barbaric blood without being affected by its

influence” (217). He continues after some vague words of assent from Iola and Robert to expound on “the great distinction between savagery and civilization,” that is, “the creation and maintenance of law.” Gresham, for his part, acknowledges “the friction of the ligatures which bind [black and white] together,” but still “hope[s] that the time will speedily come when...both races will unite for the maintenance of law and order and the progress and prosperity of the country” (218). Iola’s mother suggests the need to make this grand theoretical register relevant to the individual, echoing Gresham in a left-handed way: “I hope that time will speedily come...My son is in the South, and I am always anxious for his safety” (218). This group conversation, distinct from the earlier conversation on the same theme between two of its participants (Iola and Gresham) also distinguishes itself by the manner in which the indisputability of Christianity mediates the more speculative sociological question at hand, leading to a synthesis of empirical realities with moral exigencies and social abstraction with individual experience.

This discursive recipe receives two important repetitions toward the end of the novel, in two contrasting, consecutive chapters, one depicting a discussion among colleagues at a medical conference and the other a *conversazione* held by a Mr. Stillman at which various race workers and allies meet to discuss the future of the race. These chapters repeat the thematic conflict evoked in the debate between Iola and Gresham and further divide intellectual pronouncement into two kinds: those which occur “on stage” and those which occur “off stage.” These positions are surprisingly reversed for the reader—prepared speeches in both chapters, which would take place on stage from the perspective of characters in the novel do not take place “in scene” for readers—but poems, impromptu speeches, and *ex parte* conversations that aren’t delivered on stage are fully explicated for the reader. The real action occurs in private conversations (or at least conversations that do not have a ritually public form) while prepared orations are delivered

to the reader in paraphrase only. Hazel Carby has pointed out that Harper incorporated text and ideas from her essays and speeches throughout the novel.⁶ Bolstered by this observation, I suggest that Harper employs the on stage/off stage dichotomy to critique the male- and theory-driven theatricality of advancement, or at least to contrast this discursive spectacle—with the more quotidian yet equally radical (if not more so, due to its pervasiveness) efforts to change one’s immediate circumstances, to raise the consciousness of one’s immediate circle, to actively uplift and to passionately feel uplifted. In this two-chapter sequence, Harper deploys first Dr. Latimer (Iola’s eventual husband), and then Iola herself, as individuals who present, respectively, a “black exception” and then a “female exception” to the gestures of aggregation, abstraction, and ultimately, spectacularization behind theories of civilizational progress.⁷

In the first of these chapters, a white supremacist variant of civilizational sociology confronts a “black exception” as a group of Doctors discuss heredity and environment. This group of primarily white doctors, including Dr. Gresham, with whom readers are already acquainted and Dr. Latrobe, a Southerner, discuss the promise of a younger colleague, Dr. Latimer. Gresham and Latrobe agree on the young doctor’s intelligence, though Latrobe, who

⁶ A large part of the dialogue between Latrobe, Latimer, and Carmicle, for example, “was taken from one of [Harper’s] lectures entitled ‘Duty to Dependent Races,’ delivered in 1891” (*Reconstructing Womanhood* 85). It is exactly on these grounds that Carby concludes that, “far from being Harper’s least successful project”—which was the critical consensus before Carby, Harper’s “incorporation of her essays and speeches into her novel makes *Iola Leroy* the culmination of her career” (*Reconstructing Womanhood* 63).

⁷ Though I am not prepared to fully agree or disagree with him, I do intend to broach the same problems as does Kevin K. Gaines in his remarkable critique of 20th century racial uplift ideology. In *Uplifting the Race: Black Leadership, Politics, and Culture in the Twentieth Century*, Gaines begins with a look at the development of racial uplift ideology in the Reconstruction Era, seeing the ideology and the vexed negotiations of race, class, gender, region, and culture it indexes as an early step in the genealogy of the post-Civil Rights (and especially Reagan-era) obfuscation of racial issues in America. In a chapter on Anna Julia Cooper, who I will also encounter in this chapter, Gaines problematizes oversimplified readings of Cooper’s black feminism, noting her “ideological diversity” and her shifting class, culture, and race-based attitudes especially concerning labor issues. Gaines judges that Cooper “romanticized blacks and women as messianic social groups”—an exceedingly negative judgment given that Gaines characterizes our contemporary moment as one of “spectacle[s] of posthumous black messianic leadership,” that is, “nostalgic mass-media narratives of civil rights” which mobilize “images of a charismatic, messianic leader, invariably male, and usually martyred” (147; xii).

has otherwise enjoyed Latimer's company, admits he "seems to be rather cranky on the negro question" (237). The three had, in fact, been arguing the topic the previous night with Robert (Iola's uncle) and his friend Reverend Carmichael, both black. What Dr. Latrobe doesn't know, despite his avowal that his "practiced" eyes "can always tell" a mulatto from a "true" white, is that Latimer proudly identifies as black, though he can pass—perhaps more easily than any of the other light-skinned characters in the book (229). The group—without Robert and Carmichael—reconvene after Dr. Latimer has delivered a paper on "heredity and environment" (237). Gresham praises the paper and applies it to immigrants and newly-freed blacks, saying "Continental Europe yearly sends to our shores subjects to be developed into citizens. Emancipation has given us millions of new citizens, and to them our influence and example should be a blessing and not a curse," at which Latimer confirms his intention "to go South, and help those who so much need helpers from their own ranks" (238). Returning to the white supremacy of his remarks of the previous evening, Latrobe cautions Latimer against "the folly of equalizing yourself with [negroes]," since "in equalizing yourself with them you drag us down; and our social customs must be kept intact" (238). This is when Latimer reveals his racial affiliation and Latrobe storms off in the polite huff that is the province of the Southerner. The supremacist sociology of the night before, based around Latrobe's conviction that he and other Caucasians "belong to the highest race on earth and the negro to the lowest," debunks itself when its representative, Latrobe, simultaneously fails a test of his avowed empirical powers (he cannot observe that Latimer is black) and his powers of civility (227). In this sense, Latimer *is* the black exception. Additionally, in moving from a public stage, where he presents his paper, to a private stage, where he defends his selfhood and moral vision, Latimer successfully *takes* exception to a

discourse (again: the discourse of civilization progress) that would otherwise dispose of the thorniest problems of individual experience.⁸

In the following chapter, male-dominated sociology (white or black) has a similar confrontation with a “female exception” at the *conversazione*. In this chapter, Iola meets with a group of her peers, for the sake of delivering and discussing something like conference papers. Readers are not treated to much of the content of these papers, which are identified as follows:

Bishop Tunster had prepared a paper on “Negro Emigration.” (246)

The next paper was on “Patriotism,” by Rev. Cantnor. It was a paper in which the white man was extolled as the master race, and spoke as if it were a privilege for the colored man to be linked to his destiny and to live beneath the shadow of his power. He asserted that the white race of this country is the broadest, most Christian, and humane of that branch of the human family. (249)

The next paper was by Miss Iola Leroy, on the “Education of Mothers.” (253)

The closing paper was on the “Moral Progress of the Race,” by Hon. Dugdale. He said: “The moral progress of the race was not all he could desire, yet he could not help feeling that, compared with other races, the outlook was not hopeless. I am so sorry to see, however, that in some States there is an undue proportion of colored people in prisons.” (254)

Attendees discuss the content of the papers, but the above are the only direct descriptions offered of the papers themselves. On the other hand, the full text of a poem read at the event is reproduced, as are lengthy impromptu speeches by Iola and Reverend Carmichael, who arrives

⁸ Here we should remember Desrosières’ explication of the formatting procedures of statistical thought, encountered in the previous chapter, for one method (if not the paradigmatic method) by which a gradualist discourse of social development would dispose of or sidestep questions and details that might present as irreducible individual.

too late to read his intended paper. The content of Iola's extemporization—one might even call it an outburst—further underscores the thematic of the on stage/off stage dichotomy.

Of all the on-stage papers, that is, those that are performed in front of a public, Iola's receives the least discussion—a few lines of pithy, polite ascent compared to the pages of discussion of the male papers. Attentive readers have, of course, heard her plenty—offstage—as she shares ideas with friends and family, here it is as if she has not been heard at all and so Iola punctuates an evening of dialogue dominated by male speakers discussing sociological topics with her own impassioned Christian eloquence. As the group discusses Dugdale's "Moral Progress" paper, she spontaneously overflows with feeling—"My heart...is full of hope for the future," she says—offering a typological comparison of "the negro" with Christ (256). "Has the negro been poor and homeless? The birds of the air had nests and the foxes had holes, but the Son of man had not where to lay His head," she says, as part of an extended comparison that continues for a full page and more. Only one sociological beat appears in her speech, when she refers to "pain and suffering" as "factors in human development," perhaps mocking the dispassionate rhetoric of the academics attending the *conversazione* (256). Such turns of phrase fade into the background as Iola develops her long similitude, bringing the conclusion of the previous *private* discussion with Dr. Gresham—that the "one remedy by which our nation can recover from...slavery" is "a fuller comprehension of the claims of the Gospel of Jesus Christ, and their application to our national life"—into a *public* space (216). Implicitly disputing the value of social science, Iola remains unconvinced by ideas like those of "Professor Gradnor" who "favor[s] missionary efforts...for the redemption of Africa," African Americans having had the "the privilege of using climatic advantages and developing under new conditions" in the

United States (246).⁹ Her Christian rhetoric provides both the call to action and the through-line from individual to family to community to “the social” in its abstract form that scientific discourse, as Iola encounters it, neglects. With these remarks Iola Leroy and Francis Ellen Watkins Harper dispute the value of social science, evoking the qualities by which Lauren Berlant reads Iola as a “Diva citizen,” one who seeks to avenge flaws in the public sphere through a “heroic spectacle” of individual will.¹⁰

Like Berlant, and Russ Castronovo after her, I agree that Iola offers a “challenge to the national style of allegory,” yet I find Iola’s challenge to be less ambiguous and auto-deconstructing than do Berlant and Castronovo (Castronovo 226).¹¹ Taking exception to

⁹ This language closely echoes that of George Washington Williams’s “protecting and restraining influences of congenial climate” cited below (550).

¹⁰ *Iola Leroy* comes up in the final chapter of Berlant’s *The Queen of America Goes to Washington City: Essays on Sex and Citizenship*, alongside Harriet Jacobs and Anita Hill. These women represent the narrative of “a pilgrimage from sexual domination in domestic and laboring spaces where ‘privacy’ names the privileges of the boss and his family, to public sphere renunciations of the nation for the pseudo-democratic promises it makes that still authorize these spaces of privileged exploitation” (24). The kind of citizenship these figures develop through their practical experience, Berlant labels “Diva Citizenship,” which has both practical and utopian resonances—and is not so much an answer to as an image of the very problem Berlant describes throughout her book, in which the Diva citizen is a variant of the infantile citizen:

For if the Diva citizen achieves individually the grand scale of nationality, her or his very success also contributes to the privatization of citizenship by indicating that individual will alone might transform the public sphere and dissolve the hierarchies of exploitation that constitute the material conditions of contemporary national life. (24)

This because of Diva Citizenships’ “potential for generating affect and political action in response to democratic cruelties, its limit as a kind of heroic spectacle” (24).

¹¹ In their ambivalent readings—or readings of the ambivalence—of *Iola Leroy*, Berlant and Castronovo naturally prove themselves to be writing *after* the very intellectual phase change Harper writes *during* and—as I claim—against, that is, the phase change during which society becomes an object of scientific study. (I ignore here a question of the relation of a cultural turn to this phase change—whether the cultural criticism of the Cold War era constitutes a reclaiming, redefinition, or contestation of “the social.” Berlant and Castronovo also bear the marks of this turn of thought.) Berlant links the “infantile” and “Diva” citizen, pointing to a subsumption of a liberating *moment* under a larger (and very problematic) tendency. Likewise, though Castronovo applauds *Iola Leroy* for questioning “citizenship itself, which signals inclusion for some by generating exclusion for others” and rejecting a conception under which “the birth of political personhood often necessitates the death of corporeal, ancestral, and other nonnational bodies” he also points out that the pluralistic cast of characters, in the end, are “subsumed under the moral logic of the United States,” when Harper’s narrator announces that they each “add their quota of good citizenship to the best welfare of the nation” (208; Harper qtd. in Castronovo, 208). My suspicion is that Berlant and Castronovo’s interest in *subsumption* comes from a *post facto* capitulation to the necessity of a positivist, gradualist discourse of the social that lingers from this very sequence of nineteenth century history and thought. The capitulation: any mode of thought that sustains the individual as fundamental, sovereign, or in some other way

planning and theorizing that removes itself from the current context, Iola reasserts the typological obviousness and immediacy of the work to be done, a Christian reconstruction of family and community. To understand this intervention—and how it qualifies as a female exception—will require a survey of an earlier generation of social scientific texts to which characters like Professor Gradnor and their statements might allude. Placing *Iola* among companion texts by early black feminists further clarifies the intervention. By placing *Iola Leroy* within this context, I suggest that Iola, in her typological intervention, wants to do more than spread the message of long-suffering heroism. As Jewett does in her fiction, Iola (and Harper) wants to problematize sociological and statistical reasoning that proceeds by homogenizing social aggregates.

The Sociological Conclusions of “Reliable History”

Several works of history and ethnology, written by black (male) intellectuals in the decades following the Civil War give the emergent social sciences pride of place in racial uplift. Daylanne K. English has made a compelling case for the problematic ubiquity of eugenics in the early decades of the twentieth century. Though it was, in her analysis, simply white supremacy in another guise—scientific racism *au courant*—the discourse was also paradoxically useful for black intellectuals as well as their racist opponents. English explains that “Eugenic ideology was ‘salient’ for so many modern thinkers across political and racial lines because, unlike more general discourses of race, it eased the conflict between individual and collective forms of identity...to improve the collective (race or nation), they simply had to determine which

irreducible in quality *also* neglects the responsibility and coherence of the social thought required to both qualify *and quantify* the vicissitudes of history, politics, and culture.

individuals should breed.”¹² English rightly sees this as a useful basis “to examine often overlooked commonalities—as well as significant disjunctions—among Progressive Era public policy and social science, Harlem Renaissance aesthetic visions and class politics, and American modernist literary experimentation and racial politics”—an excellent, galvanizing statement of why a study of eugenics might be valuable to literary criticism and history of the early decades of the twentieth century. Yet English’s story of science doesn’t involve African American luminaries’ scientism before the advent of eugenics in the early decades of the twentieth century though a palpable belief-in-science presents itself in the discourse of racial uplift, reaching as far back as Frederick Douglass.¹³

A palpable belief-in-science can be witnessed across the nineteenth century discourses of abolition and racial uplift, starting from Douglass and extending, unbroken, to DuBois. Long before Du Bois made his name as a sociologist, a handful of black intellectuals were already taking up the methods and aims of science writing, if not empirical science strictly speaking, to bolster the struggle for equality by the use of “truth” in its scientific signification.¹⁴ William

¹² English’s gloss of eugenics here deserves the additional emphasis, by way of historicization, provided by one of Galton’s biographers. Galtonian eugenics, according to Michael Bulmer in *Francis Galton: Pioneer of Heredity and Biometry*, is poorly understood. First, Galton lamented the long standing dysgenic practices of European civilization, for example, the tendency of the best and brightest to join the intellectual - and celibate - ranks of the clergy. Or, one could point to the “costly tone of society, which discouraged an ambitious and talented man from encumbering himself with domestic expenses until he could afford them” (80). Galton wanted to reverse these tendencies, “improving the human race by encouraging early marriage between talented men and women...suggest[ing] that this objective could be brought about by a system of endowment based on examination results” (80). “Hereditary improvement was necessary because civilization was advancing more rapidly than our ability to cope with it” (80). Though he became more hardened concerning repression of “weaker” characteristics toward the end of his life, Galton - especially after formulating the law of regression - held that selection of small deviations from the racial type (individual differences) would not lead to permanent change since they would be subject to regression back to the central type; only selection of large deviations (sports) would be effective since they represent a new focus of regression. (83) That is to say, there is more eugenic force in promoting the procreation of strength and genius rather than discouraging the procreation of weakness and “feeble-mindedness.” Still, Galton admitted that it would likely be necessary (though problematic) for society to “restrain ill-omened marriages” (qtd. in Bulmer, 83).

¹³ See Ellis.

¹⁴ It is not at all controversial to note that Du Bois was an early figure of American sociology. Dating, contextualizing, and appreciating his contributions, however, raises fewer academic eyebrows than it should.

Wells Brown publishes *The Rising Son* in 1874. In 1880, Martin R. Delaney publishes his *Principia of Ethnology*, a text bearing the impressive, if not intimidating, subtitle *The Origin of Races and Color, with an Archeological Compendium of Ethiopian and Egyptian Civilization, From Years of Careful Examination and Inquiry*. Delaney could, in fact, follow the impressive title with an even more impressive list of British scientific associations to which he belonged. By 1883, these works would be joined by George Washington Williams's massive two-volume study, *A History of the Negro Race in America from 1619 to 1880*. As with the previous two works, its full title gives some hint as to its social-scientific parameters: *Negroes as Slaves. As Soldiers. And As Citizens; Together with a Preliminary Consideration of the Unity of the Human Family, an Historical Sketch of Africa, and an Account of the Negro Governments of Sierra Leone and Liberia*. These works reflect the ambition to uplift the race by providing sweeping, yet comprehensive and detailed, histories consonant with the emerging practices of so-called

Shamoon Zamir, in *Dark Voices*, finds in Du Bois early writing "a constant movement between a typically nineteenth-century affirmation of heroic vitalism and natural law as twin guarantors of a progressive historical progress and a complex description of the fracture of this confidence and of consciousness's struggle to survive the collapse" (4-5). Zamir places Du Bois's "quest as sociologist for a science of society that will reveal universal laws of social causality" under the former heading and *The Philadelphia Negro* - "a positivist defense of scientific objectivity [which] cautions against the kind of idealist philosophizing of the laws of history"—under the latter heading (5). Zamir also points to "a dichotomization"—seen in Emerson (European sepulchers vs. transparent eyeball) and James (American healthy mind vs. European sick soul), which "supports a refusal of the creative and social import of speculative thought and leads to a false separation of action from consciousness, something that George Santayana, who also taught Du Bois, pointed out long ago" (15). Zamir reads Du Bois as a *zeitgeistlich* compatriot of Henry Adams who "seeks to sustain the relationship of creative imagination and speculative thought, not to evade it" (16). Aldon D. Morris offers a more incisive assessment in his recent work, *The Scholar Denied*. Simply put, Morris "offers...a comparison between the Chicago school of sociology and Du Bois's Atlanta school, clearly showing that the latter theorized the novel view that race was a social construct and supported this position with pioneering methodologies and empirical research" (xxii). Morris shows how Du Bois had a coherent research program, even in the mid-1890s, which would come to fruition in Atlanta (ch. 3). By comparison, Chicago enters the game late: in the mid-to-late 1910s, and early 1920s, with the arrival of Robert Ezra Park, who, in Morris's view, connects Chicago sociology with a retrograde kind of social Darwinism (ch. 4). My present argument pushes Aldon's revisionary impulse back a generation further. While certainly not "organized" into "schools" - not even hosted, primarily, by academic institutions, the writing of Brown, Williams, Crummell, and Delany—and the influence it has on Harper, Cooper, and Matthews, pre-dates the late-19th century ascendancy of Du Bois.

scientific historians.¹⁵ Focusing on these figures also fills in a gap in the narrative bookended by recent studies of black scientism, from Britt Rusert's formulation of the antebellum "fugitive science" that sought to refute, on the same theatrical and lecture circuits of their opponents, the performances of scientific racism to Sarah Wilson's perceptive treatment of "quantification in Du Bois."¹⁶ Brown, Crummell and Williams represent a generation of black intellectuals for whom science served as both antagonist and resource. As each figure in turn will show, the stakes of scientific inquiry were abundantly, even gloriously clear, and thus provided an ideal battleground to address race as a social construct and a tool to imagine the amelioration of the social problems its construction creates.

William Wells Brown highlights the need to interrogate known histories to bolster claims of African equality, invoking a broad spectrum of sciences to dispel racist speculation. Brown's history begins with scriptural references to Ethiopia balanced by sources like Homer, whose "poems are well ascertained to be a most faithful mirror of the manners and customs of his times, and the knowledge of his age" (42). We can, according to Brown, "trace the light of Ethiopian

¹⁵ Pointing out the avant-garde sensibilities of George Washington Williams, one of his biographers has even suggested that Williams was ahead of the curve of the scientific historians. Without connection to the rich, privileged, white historians (one of them was Henry Adams) who would launch scientific history in America in the famous history seminars at Harvard and Michigan, Williams pioneered the use of newspaper, ephemera, and oral sources to construct his two-volume history of Afro-America. Williams later work, *A History of the Negro Troops in the War of the Rebellion, 1861-1865*, inspired a 19-year-old W.E.B. DuBois, who reviewed the work for the *Fisk Herald* (Franklin 658; 665). In a similar vein, Carla L. Peterson points to the epochal founding of the American Negro Academy at a March 5, 1897 meeting of several leading black intellectuals as specifically noteworthy because it began with an address by Alexander Crummell and ended with a paper by the young Du Bois. Peterson suggests that the canonization of Du Bois's paper, later published as "The Conservation of Races," "has obscured several facts"—chiefly that the paper derives from a "group effort in which the thinking of other unnamed black intellectuals working across the nineteenth century infused Du Bois's speech" (502). Pursuing these unnamed intellectuals would reveal the maligned caricature of Washington and Du Bois as polar figures to be historically as well as figuratively problematic, since there were "Washingtonians before Washington and Du Boisians before Du Bois" and, moreover, "Crummell had been both" (504). Peterson seeks to recapture the influence of Crummell and similarly forgotten figures on late 19th and 20th century black thought, since several such figures "had placed race in a broad historical and geographic context and conceptualized cosmopolitanism along the lines of today's revisionary critics" (515).

¹⁶ See Britt Rusert, "The Science of Freedom: Counterarchives of Racial Science on the Antebellum Stage" and Sarah Wilson, "Black Folk by the Numbers: Quantification in Du Bois."

civilization first into Egypt, thence into Greece, and Rome, whence, gathering new splendor on its way, it hath been diffusing itself all the world over” (44). Brown seeks to establish African primogeniture for the contemporary world to negate the force of both scientific and scriptural arguments for racial discrimination. Brown intentionally confuses scientific and scriptural historiography to enact this negation, exploiting uncertainty or disregard of the difference between these two registers to point out the overdetermined falsehood of racial discrimination, wrong no matter what archives it draws upon.

The Bible, at first glance, seems to have “but little” to say about “the color of the various races of man, and absolutely nothing as to the time when or the reasons why these varieties were introduced,” so Brown moves on to other sources, noting that “*all reliable history* favors the belief that the Ethiopians descended from Gush, the eldest son of Ham” (44, 45 emphasis added). Brown then refutes the well-traveled “Curse of Ham” argument with some etymology (“Ethiop, in the Greek, means ‘sunburn’”) and an alternative theory of pigmentation based on climatic variation whereby science refutes scripture. Scripture can also supplement science, as when a Biblical allusion pointed us toward “all reliable history,” or when Brown asserts that “the word of God by his servant Paul has settled forever the question of the equal origin of the human races.” We can read in the Bible, Brown reminds us, that “God hath made of one blood all the nations of men for to dwell on all the face of the earth” and so must “insist upon unity, although we see and admit the variety” (46). As with the beginning of his work, Brown again raises the specter of speculation—finding reliable sources, attending to the details that are actually given in them, as well as in scripture, and treating this all within scientific parameters will dispel erroneous theory and speculation. Of course, the racist speculation “falls to the ground”—

anthropology, archaeology, ethnology, and history done correctly, Brown might say, allow us to “see and admit the variety” and reconcile this with appeals to unity.

Like Brown, George Washington Williams foregrounds the role science plays in his history. Even though the “pro-slavery arguments [based] upon biblical ethnology and the curse of Canaan” have been roundly refuted by scientific ethnology, he finds this refutation to bear repeating. He also aims to satisfy as much as possible “a growing desire among the enlightened Negroes in America to learn all that is possible from research concerning the antiquity of the race” (vi). An exhaustive compilation of statistical data rounds out the usefulness of the sciences for Williams’s project, since statistics “are full of comfort and assurance to the Negro as well as to his friends” (viii). Williams dismisses erroneous biblical theories of skin color out of hand before surveying the variety of scientific explanations. Whether based on the theory of humors, on dermatology, or on environmental influence and variation, Williams declines to favor any theory, finding “something plausible” in each while still judging them “verily all speculation” (21). Like many nineteenth century statisticians and social scientists, Williams prefers description—numerical when possible—rather than speculation on causes. Hence the portions of his history dealing with ancient history are tempered with data: descriptions of climate, geographical coordinates, and comparative linguistics. Hundreds of pages later, after the construction of a narrative of US history and the deployment of dozens of tables with import/export balances, lists of black newspapers, census data, military enlistment rates, and so on, Williams can speak of the future of the race in explicitly sociological terms. The African American “is now under the protecting and restraining influences of congenial climate... sociological laws will impart to his offspring the power of reproduction and the ability to maintain an excellent social footing with the other races of the world.” (550). Here is a snatch of

the eugenic thought that English's *Unnatural Selections* locates in the 1890s and beyond, but in the language of environmental inevitability rather than social control.

Such sociological axioms also emerge among the “new ideas” recommended by Alexander Crummell. “The influences and agencies” to regenerate Africa “must come from *external* sources,” Crummell holds, since “civilization is always, in its first outgrowths, among rude peoples, an exotic...it must be transplanted from an old to a new soil” (v). The papers in *Africa and America* were collected under Crummell's direction, ignoring chronology in favor of “the author's conviction of their relative importance to the people to whom they refer” (iii). Hence, the address, “The Need of New Ideas and New Aims for a New Era,” is his most important intervention—not the least because the it met with audience member Frederick Douglass's “emphatic and most earnest protest.” Against “a constant recollection of the slavery of their race and of the wrongs it had brought upon them,” Crummell advocated “the shifting of general thought from past servitude, to duty and service, in the present” (iii-iv). Themes concerning of regenerating agencies, civilization as “exotic,” and the movement beyond a “childhood of knowledge” occupy a central place in this all-important speech.¹⁷

In “New Ideas,” Crummell argues the future of the race depends on the uplift of the family as an institution, the condition of organized black labor as a social aggregate, and the health of black morality while he specifically dismisses the pursuit of political office and aesthetic life as pursuits that will squander the energy of the race. While Crummell makes no claims to develop a rigorous scientific treatment of the problems he evokes, he certainly foregrounds a speculative solution: one needs to deal with an aggregate as a social entity with both an inside and an outside. Crummell holds that “no people can be lifted up by others to grand

¹⁷ Citing Liberia, Crummell recalls “that these settlers—but children in knowledge, were transferred...from the ignorant plantations of America to the wilds of Africa” (vi).

civility. The elevation of a people, their thorough civilization, comes chiefly from internal qualities” (31). Again, in the preface, Crummell says, of the “regeneration” of Africa: “Civilization is always, in its first outgrowths, among rude peoples, an exotic.” In the “New Ideas” address, Crummell contradicts this postulate, arguing that “the primal qualities of a family, a clan, a nation, a race are heritable qualities...[and] remain, notwithstanding the conditions and the changes of rudeness, slavery, civilization and enlightenment.” He concludes: “it is law of moral elevation that you must allow the constant abidance of the essential elements of a people’s character” (35). Crummell evokes an ambivalence about transmission, which he sees as having alternately exotic and endemic agencies or sources.

However conflicted these “new ideas” may be, Crummell charges his audience with their duty in the clearest terms. Philanthropic men and women will need to “go down to the humblest conditions of their race, and carry to their lowly huts and cabins all the resources of science, all the suggestions of domestic, social and political economies, all the appliances of school, and industries” (31). Crummell’s address confidently suggests that the sciences have a role to play in racial uplift due to the sociological parameters of the question. For the intellectuals of this Civil War generation—Crummell, Williams, and Brown—science appears to have been more than just a tool to transform chauvinist rhetoric into scientific error, it was also the method to find the way forward. Despite the occasional (and that is not at all to say *superficial*) reliance on a Christian ethical outlook, the *method* of racial uplift is social science.

Effectively reversing these priorities, *Iola Leroy* expresses a clear ambivalence toward sociological speculation. If, as Hazel Carby famously wrote, *Iola Leroy* “needs to be assessed...as a novel which was written to promote social change, to aid in the uplifting of the race” we will also need to distinguish the novel’s conception of the social from the sociological

thought of Crummell, Williams, and Brown (63). *Iola Leroy* recommends reversing Crummell's conclusion, with Harper admitting occasional reliance on a scientific ethos or worldview but more significantly more invested in a Christian method of community reform. To evaluate this appearance, though, we need to know what Iola, Dr. Latimer, Dr. Gresham, and so many others who debate the subject intend by "social" and how they grasp its dynamics, that is, how *the social can change*.

Leaving the *conversazione*, Iola—again in conversation with a suitor, this time Dr. Latimer—resolves to "to do something of lasting service for the race" by writing a novel, echoing the novel's paratexts and tying the novel to the thought of two other uplift orators (262). Latimer suggests writing a book because "out of the race must come its own thinkers and writers" to supplement "authors belonging to the white race [who] have written good racial books," but fail to completely empathize with Afro-America (263). Iola jokes that Latimer will be the hero of her book while readers know that she, herself, is the hero. This scene echoes the extra-diegetic claims that frame the narrative, concerning the value of its author's literary contribution.¹⁸ Harper's claim at the close of the narrative expresses her hope to inspire current and future generations of African Americans to "embrace every opportunity, develop every faculty, and use every power God has given them to rise in the scale of character and condition, and to add their quota of good citizenship to the best welfare of the nation" (282). The tension of dual idioms, that of religion, with its "embraces" and its God-given things, and that of social

¹⁸ The scene also anticipates an important insight of Kenneth Warren's *What Was African American Literature?* Dismissing the project of organizing a taxonomy, Warren emphasizes a productive tension arising from two functions of African American literary texts: the instrumental (meant to improve the status of African Americans) and the indexical (meant to indicate the accomplishment of African Americans) (10-12). It is noteworthy that, at a broad conceptual level, these functions correspond to diachronic and synchronic temporalities. Instrumental literature works across time to achieve a historical project while indexical literature suggests the high-water mark of the race at a given time. Both functions, anyway, evidence Warren's theme, that "Absent white suspicions of, or commitment to imposing, black inferiority, African American literature would not have existed as a literature" (17).

science with its “scale of character” and “quota of good citizenship,” casts its own shadow over the otherwise confident end of the novel, though not in the way suggested by Castronovo’s reading of this phrase.¹⁹

The preface to the novel displays similar sentiments from William Still, a towering figure of the Underground Railroad, who wrote a famous account of that movement, and—perhaps—the inspiration for Mr. Stillman, convener of the *conversazione*. Still had his “doubts about the matter” as to whether a mere story would afford Harper “the best opportunity for bringing out a work of merit and lasting worth to the race.” “Hearing a good portion of the manuscript read,” though “and a general statement with regard to the object in view,” Still somewhat ambivalently recognizes the value of the book (1). This ambivalence is the place to pause the current analysis of *Iola Leroy* and examine the ideas of two activist-orators whose most celebrated speeches touch upon the same ambivalence in and about black writing of the later decades of the nineteenth century. In public discussion, between individual race workers, and within individual works, the question of “merit and lasting worth” and how to recognize it intersects with the already less-than-comfortable intermingling of scientific and humanistic discourses of uplift. Can the need for advancing the race be demonstrated, constructed, and prosecuted? Or can it only be felt and worked through with the kind of inspired fanaticism we have already seen described by George W. Julian? Anna Julia Cooper and Victoria Earle Matthews will exhibit two crucially opposing attempts to resolve these questions.

The Good Material of Race Literature

Victoria Earle Matthews delivered “The Value of Race Literature” to the First Congress of Colored Women of the United States in 1895, an oration in which she defines “race literature,”

¹⁹ See note 11.

explains its necessary effects for the future of America, and lays out the roles women ought to play in its cultivation. Echoing Crummell, Matthews questions whether a literary tradition can both preserve a history of oppression and evolve its community beyond that oppression. She speculates about the social identity the labors associated with “Race Literature” might produce. These are genetic matters, with seemingly eugenic answers²⁰, as is underscored in no uncertain terms by Matthews’s own conclusion, that “earnest and systematic effort...to *procure and preserve for transmission* to our successors, the records, books and various publications already produced by” black America. Otherwise, “not only will the *sturdy pioneers* who paved the way and laid the foundation for our Race Literature, be robbed of their just due, but an irretrievable wrong will be inflicted upon the *generations* that shall come after us” (185). Transmission of sturdy pioneer material is essential for future generations: when this argument moves from how literary production works to how to make it work *well*, how to make it produce the best future specimens, it moves from genetic to eugenic.

Matthews defines race literature as “a general collection of what has been written by the men and women of that Race,” that is, “the entire results of knowledge and fancy, preserved in writing.” Simple linguistic boundaries are insufficient to denominate “a literature,” for Matthews, since “the conditions which govern the people of African descent in the United States...create a very marked difference in the limitations, characteristics, aspirations, and ambitions of this class of people” (170). Any class or group with a “marked” difference will have to create its own literature for a number of reasons: both to “dissipate the odium” of hierarchical

²⁰ Prime for inclusion in studies like Daylanne K. English’s, as palpable as the biological idiom is, in Matthews and Cooper, these authors are relatively invisible, except to critics in the celebratory tradition of black womanism. Vivian May’s work on Cooper is a paradigmatic example. One remarkable exception to this trend is Stephanie Athey, who’s concept of “Eugenic Feminism” predates the publication of English’s *Unnatural Selections* and inspired my work on Matthews and Cooper. For May’s readings of Cooper see “Thinking from the Margins, Acting at the Intersections: Anna Julia Cooper’s *A Voice from the South*” and “‘By a Black Woman of the South’: Race, Place, and Gender in the Work of Anna Julia Cooper.”

distinctions made by oppressors and to “investigate” the sociology, psychology, history, and culture of the group—something, in the case of Afro-America, white writers are already doing but are doing poorly and with prejudice (171-172). A race literature will also provide a necessary “outlet for the unnaturally suppressed inner lives” of blacks, whose writings, will then serve as “counter-irritants,” “supplying...influential and accurate information” against the type of white writing about blacks criticized by Matthews (173, 177). More provocatively, she states: “What is bright, hopeful and encouraging” in the African American character “is in reality the source of an original school of race literature, of racial psychology, of potent possibilities, an amalgam needed for this great American race of the future” (172). We could interpret this to mean the great *African* American race of the future, but acknowledging her gestures to amalgamation and the generative potential of African American arts and letters, we might wonder if she holds out the possibility of a future in which “American” and “African-American” are synonymous (she does).

Matthews goes on to put America in a universal context: “America is but a patch on the universe: if she ever produces a race out of her cosmopolitan population, that can look beyond mere money-getting to more permanent qualities of true greatness as a nation, it will call this age her unbalanced age” (177). The singular noun deserve emphasis here; Matthews hopes for a progression from a “cosmopolitan population” to one race—not “a negro race” or “races.” A related prediction Matthews makes of “Race Literature” may surprise readers of today: “[it] will undermine and utterly drive out the traditional Negro in dialect,—the subordinate, the servant as the type representing a race whose numbers are now far into the millions.” Matthews seems to indicate that certain types of African American, whether completely real, completely fictional, or

somewhere in between, will disappear to be replaced by a truer, better “high-type Negro” who she invokes in reference to Stowe’s *Dred* (173-174).²¹

If the eugenic register has so far seemed a matter of metaphor or subtext, Matthews at this point clarifies that the rationale for her argument is eugenic: “Each generation by the law of heredity receives the impulse or impression for good or ill from its predecessors, and since this is the law, we must begin to form habits of observation and commence to build a plan for posterity by synthesis, analysis, ourselves aiming and striving after the highest, whether we attain it or not” (182). She reminds her listeners that women’s part, in addition to being “an active singer” is “to receive impressions and transmit them,” to be “the means of producing poets” and to be a “stimulating influence” (184). Dispelling the uncomfortable euphemisms here by a historicizing gesture (Matthews was limited by the discourses of her day), renders Matthew’s argument no less unsettling and profound. The integrity she champions and wishes for on behalf of African American writers will produce a radically different and superior future and while this is still the future of *a* race, if Matthews’ is right, *the* race will be of a much “higher type.” Transformation rather than preservation or uplift seems to be Matthews’ highest goal.

The dramatic qualities of this argument contrast with the earlier argument of Anna Julia Cooper on the same topic. Whether Matthews was directly responding to Cooper, the antagonisms of the two arguments will lead us back to the ambivalence at the heart of *Iola Leroy* and its antagonisms with the ethnologist’s belief-in-science as the discourse that extinguishes

²¹ With such prognostication in mind and remembering the “traditional dialect” used to depict Aunt Lindy and her husband in Matthews’ popular short story, “Aunt Lindy,” one might interpret it as a story about extinction. The protagonists live outside of town, and it is hard to tell whether they are more—or less—exemplary than the black population of the town itself. Their long-lost son, only identified at the end of the story by Lindy’s former owner, “Marse Jeem,” lives in town as its new black minister. The fact that Lindy gains this knowledge by staying true to her Christian duty of care and hospitality toward the former slave owner who comes to her as a gravely injured casualty of a fire in town suggests a concise moral, but Matthews’ own literary theory might suggest a deeper ambiguity in this case.

racist speculation. On the matter of race literature, Matthews looks to a unified future, whereas for Cooper, whose thought relies on a balance of competing forces, amalgamation of any kind is inconceivable. Similarly, Matthews calls for a massive project of historical preservation, inspiration, and artistic procreation, while Cooper demands an arguably smaller quotient of quality literature in which accurate, encouraging portrayal of the Afro-American experience gets its aesthetic due. While Cooper has more of the overt trappings of an academic intellectual, her argument, in the end, is less welcoming of secular sociological reasoning than is Matthews's.

In "One Phase of American Literature," a chapter of Anna Julia Cooper's landmark text, *A Voice from the South*²², a clear definition of literature is of paramount importance. Cooper holds that literature "must contain something characteristic and *sui generis*"—only "trueness to one's habitat," she holds, produces timeless, universal, and true literature (177). Similar to Matthews, Cooper touches upon a biological register with phrases like "trueness to one's habitat." Especially since she uses "habitat" and not "situation" or "society" or "circumstances," such a phrase implies a biologicistic connection between the artist and the environment and moreover argues that trueness to this relationship produces the best art. Cooper performs a "rough classification" of two kinds of authors. First are "those...who simply paint what they see, as naturally, as instinctively, and as irresistibly as the bird sings—with no thought of audience" (181). In this group, she includes Shakespeare, George Eliot, Poe, Bryant, Longfellow and, with a qualification, William Dean Howells. The second group, not nearly as deserving of flowery description, are "the preachers," who write arguments in fiction, or poetry, but for whom the medium is a mere convenience. She places "much of Milton," Carlyle, Whittier, Lowell, Bellamy, and Tourgee as examples of this second group of writers. Cooper suggests that white

²² The Schomburg Library edition of Cooper's *Voice* (a facsimile edition), provides two distinct titles for this chapter. In the table of contents, it is identified as "The Negro as Represented in American Literature."

writers who portray black characters with sympathy will be lost to time because of their tendentiousness while white masters of the written word simply don't know or care enough about black culture and experience. Worst of all, black artists themselves aren't getting proper encouragement. What Cooper wants, then, is neither tendentious writing nor voluminous writing but rather quality imaginative literature by black authors.

Cooper, who would go on to receive a PhD in history from the Sorbonne, develops an extensive sociology of human civilization, eventually turning to the problematic link between determinism and moral value. Her view is that "All through God's universe we see eternal harmony and symmetry as the unvarying result of the equilibrium of opposing forces"; sociocultural attainment of this equilibrium is her avowed goal (150). Ambivalence arises, though, when Cooper takes note of the pessimistic variant of this view, as when she promises that educated women will put an end to "science annihilating personality from the government of the Universe and making of God an ungovernable, unintelligible, blind, often destructive physical force" (58). She reiterates and elaborates this rejection in the final chapter of her work, "The Gain from a Belief," highlighting the propositional necessity (if nothing else) of a benevolent God and demanding we choose between "lofty, unimpassioned agnosticism, that thinks" and "hobbling, blundering, unscientific faith, that works" (297). In this formulation it is tellingly hard to judge whether Cooper means "works" as "toils" or as "functions." In either sense, this "unscientific faith" is clearly opposed to agnostic thinking.

The need to be on the side of "unscientific faith" is absolute, alarmingly so: "The great, the fundamental need of any nation, any race, is for heroism, devotion, sacrifice; and there cannot be heroism, devotion, or sacrifice in a primarily skeptical spirit" (297). This reasoning on the value of faith—never mind the paradox of reasoning that faith is more valuable than

reason—brings Cooper to the conclusion of her work. Here she acknowledges the “nations still in darkness to whom we owe a light” and prods here readers to action, urging that “the world is to be moved one generation forward—whether by us, by blind force, by fate, or by God! If thou believest, all things are possible; and as thou believest, so be it unto thee” (303-304). Her shift to antiquated second-person inflection announces the missionary call to action that specifically invokes scientific thought only to subjugate it to faith-driven action—from which point we can return to *Iola Leroy*’s sympathetic ambivalence about sociological and biogenetic realities (however conjectural those realities may be). In the case of Francis Ellen Watkins Harper’s novel, as with Anna Julia Cooper’s *Voice*, the affirmation of Christian sentimentalism requires the rehearsal of the very science with which the author is uncomfortable.

***Iola Leroy*, or, Many a Slip Betwixt Social Science and Social Conscience**

While social *science* might be a matter of propositional, scientific truth, *Iola Leroy* both depicts and demonstrates a different kind—and perhaps more reliable—certainty to lie in the affective field of social *conscience*. With here sentimentalist plea, Iola herself interrupts the sociological narrative in which the Civil War breaks with the past, placing the United States back on the track of gradually improving civilization. To be an effective interruption, Iola must contend with the parameters of this narrative thrown into relief by the three other elements I’ve dealt with in this chapter: the Civil War generation of scientific histories and ethnologies, the sociological plot of the novel (in which Iola would be a mere instance of a larger movement, rather than, as Badiou might say, the bearer of a truth), and the debate over literary production exemplified by Matthews and Cooper. Compared to the mediation of sociological processes (aggregation in social scientific study, eugenics in literary production), one can feel Christian *immediately*, that is, right away and unquestionably. Along these lines, Lori Robison’s reading of sentimental

rhetoric in *Iola Leroy*, with its focus on the ambivalent racialization of bodies, also goes a long way toward explaining the ambivalence toward scientific discourse in the novel. In Robison's words, the rhetorical strategy is to "erode racism" through feeling—specifically sentimental, sympathetic identification with the emotional lives of characters (459). Science doesn't create feeling, it postulates fact and so one is rightly suspicious whether it can "erode racism"—it certainly seems to preserve "race" as an analytic category and thereby preserves the formal possibility of racist arguments, however compellingly right-minded scientists might dismiss these as false.²³ Comparatively, the sentimental rhetor can be certain that she has made her auditors feel rightly—and hence, in a reversal of roles emotion becomes more "objectively" right (or wrong) than reason can be, since it requires more deliberation. Simply put: false arguments can resemble true arguments while sympathy can hardly be mistaken for antipathy.

The question of "merit and lasting worth" raised by the valuation of humanist, sentimentalist, religious novel writing replaces the debatable truth value of scientific propositions with the immediate and indisputable valence of affective certainty. *Iola Leroy* can be contrasted with *The Gilded Age* and the perspectives of Donnelly and Jewett. The endorsement of scientific professionalism and administration found in *The Gilded Age* would promote the sociologists over the uplift activists, and Donnelly and Jewett both seek to reframe the *objective* position of the human individual. In *Iola Leroy* subjective affirmation produces a certainty more valuable and solid – less speculative – than propositional truth. *Iola Leroy* postulates a reversal of roles for

²³ In his fascinating new book, *Blood Work*, Shawn Salvant adds weight to Robison's argument by pointing to a paradox. While "as a scientific claim, race was born from a discipline whose methodological commitments would ultimately...guarantee its undoing," the poststructuralist critique of race as a social construction has the effect of negating this negation. "Race as a metaphor is here to stay because," Salvant argues, since, "by recasting race as a form of figurative language, critical race theorists and literary critics ultimately conserve race" (2). That is: "the metaphorical conception of race will persist because, as theories of metaphor itself have demonstrated, metaphorical figuration is not only occasional but rather a mode of thought that governs (if not makes possible) the very negotiation of everyday life" (3).

fact and feeling: emotion becomes more objectively right (and wrong) than reason can ever be. Despite the celebrated antagonism between racial equality and scientific racism, and the less-trumpeted black-scientific response (deserving further study in any case), the historical value of *Iola Leroy* is enhanced when we recognize it as a chapter in the birth of social science that records the option of subjecting “scientific knowing” to “activist feeling” (or: the paradox that scientific certainty can be more speculative than activist idealism when viewed from the standpoint of an engaged partisan).

Debates like these, about science and its relation to speculation and truth (as product or spiritual substance), become less visible as twentieth-century disciplines, genres, and niches develop—and continue to do so into the twenty-first. Recapturing these earlier debates can disrupt some of today’s lingering false dilemmas and the sociocultural antagonisms they perpetuate.²⁴ In other words, contemporary scholarship and debate on black activism/intellectualism tends to privilege the term to the left of the slash, group this with “social thought” and political striving, and these in turn are linked to humanist pursuits, divorced and devoid of any “taint” of science, which is typically only conjured as a bogeyman (eugenics, scientific racism) or in its safest, most inert—and, not for nothing, politically malleable—form, statistical demographics. What is more or less invisible, certainly in contemporary news media and web culture, but also to be captured in the results from a database search on African-American literature: until at least the era of the World Wars, to muck about in “the social” meant to enter into scientific terrain, whether one was writing a novel, a historical tome, or delivering

²⁴ Some of these dilemmas are, in fact, not so false. In *Breathing Race into the Machine*, Lundy Braun begins with a controversial legal appeal made, in 1999, by the Owens Corning company in an asbestos lawsuit. Black complainants would need to meet a different standard of disability than whites. Braun shockingly points out that “the idea of racial difference in lung capacity cannot be dismissed as ‘pseudo,’ ‘junk,’ or ‘bad’ science, or as the work of scientists with explicitly racist intent” since the consensus view after decades of research and medical practice—held by both the American Thoracic Society and the American Medical Association is that “blacks have lower lung function than whites” (xv).

an oration to a Woman's temperance club. What might be labeled "speculation" in a negative sense in an era when professional science busies itself exorcising non-descriptive, non-mathematizable intellection, becomes more acceptable and negotiable when placed under the interconnecting headings of rhetoric, cultural production, and politics.²⁵ Hence, again, the sloganeering of the era of the Black Club Movement and beyond need not appeal to "exact science," in Newcomb's nineteenth century sense of the term, when it can appeal to rhetoric, ethics, politics, or sentiment. But writers as diverse as Harper, Crummell, Williams, and Cooper, to whatever extent their writings and utterances were ethically just, politically progressive, and rhetorically clever, they were also simultaneously, if not preeminently, aware of the force to be found in scientific acumen and cognitive clarity. The racial uplift movement, as a whole, often used a scientific idiom when it spoke truth to power; that it would have done so reveals much about the currency of belief-in-science in the final decades of the nineteenth century.

²⁵ As Manicas and Lewis seem to suggest, this is likely why the social sciences come to resemble humanities more than "hard" sciences through the course of the twentieth century—with exceptions like archaeology and physical anthropology.

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