

**The Epistemic Stance and the Rhetorical Stance: A Frequency Analysis of Modal Verb  
Usage and Rhetorical Technique in Expert Witness Testimony**

Joshua Eskew

A dissertation

submitted in partial fulfillment of the

requirements for the degree of

Doctor of Philosophy

University of Washington

2022

Reading Committee:

Gail Stygall, Chair

Candice Rai

Leah Ceccarelli

Program Authorized to Offer Degree:  
English

©Copyright 2022  
Joshua Eskew

University of Washington

**Abstract**

The Epistemic Stance and the Rhetorical Stance: A Frequency Analysis of Modal Verb Usage and Rhetorical Technique in Expert Witness Testimony

Joshua Eskew

Chair of the Supervisory Committee:

Gail Stygall

Department of English

To some Americans, the recent movements against Critical Race Theory, masks, and vaccine mandates might seem like unprecedented attacks on expertise. To those familiar with the discourse of the anti-evolution, creation science, and intelligent design movements, however, these three ongoing disputes represent only the latest episodes in Americans' century-long public dispute over the increasing role of experts in setting the terms of public discourse. In this dissertation, I offer a word frequency analysis of epistemic modal verb usage in expert witness testimony in *Scopes v. Tennessee*, *McLean v. Arkansas*, and *Kitzmiller v. Dover*, three legal cases born out of the century-long conflict over the role of evolution, anti-evolutionism, creation science, and intelligent design in public school science classrooms. In doing so, I synthesize recent research in rhetoric, philosophy, and linguistics with the concept of the "rhetorical stance" and illustrate how modal verbs, as a grammatical feature of English, contribute to the construction of what I call the "anti-expert," "counter-expert," and "para-expert" rhetorical stances. As I will show, each of these three stances deploy modal verbs to modulate rhetors' expressed level of certainty in their statements, helping them to establish their own expertise or attack that of others.

## **Dedications**

If I have achieved anything with this work, I have done so because of the support of Emma, the *sine qua non* of my happiness. Pepper and Pinky, two of the great cats of history, also made valuable contributions.

## Table of Contents

<b>I.</b>	<b>Chapter One.....</b>	1-90
<b>II.</b>	<b>Chapter Two.....</b>	91-113
<b>III.</b>	<b>Chapter Three.....</b>	114-176
<b>IV.</b>	<b>Chapter Four.....</b>	177-247
<b>V.</b>	<b>Chapter Five.....</b>	248-297
<b>VI.</b>	<b>Conclusion.....</b>	298-305
<b>VII.</b>	<b>References.....</b>	306-318

## Chapter One

### Rhetoric and Epistemic Authority

To some Americans, the proliferation of online clips depicting such scenes as “warrior moms” loudly protesting the vagaries of Critical Race Theory to their local school board, compounded by the increasing public volume of climate change denialists, anti-vaxxers, and election fraud claimants, might represent a frightening new era in which people reject the authority of scientists, historians, and other experts.<sup>1</sup> To those familiar with the discourse of the anti-evolution, creation science, and intelligent design movements, however, the recent anti-CRT, climate change denial, and anti-vaccine movements represent just the latest episodes in Americans’ century-long public dispute over the increasing role of experts in managing different aspects of public and even private life. Comparing the anti-CRT movement to the Scopes Trial, widely presented in American history textbooks as the height of the anti-evolution movement of the 1920s, historian Charles Holden observes that “anti-Critical Race Theory laws... are not just aimed to push back against the heightened awareness of the nation’s history of racial injustice. They are also attacks on educators – and on expertise itself.”<sup>2</sup> This analogy has also been made by journalists,<sup>3</sup> and it is not certainly refuted when television hosts such as Tucker Carlson regularly attack scientific, historic, legal, religious, and other experts.<sup>4</sup> Indeed, that the so-called architect of the anti-CRT movement, who frequently appears on Carlson’s show, formerly

---

<sup>1</sup> “Warrior Mom Fights Back Against Teaching Critical Race Theory.” <https://michaelsavage.com/watch-warrior-mom-fights-back-against-teaching-critical-race-theory/>.

<sup>2</sup> Charles Holden, “Experts Beware: Is America Headed for a Scopes Moment over Critical Race Theory?,” *History News Network*, June 20 2021, <https://historynewsnetwork.org/article/180483>. See also Holden’s discussion of this analogy on the radio program “Keeping Democracy Alive,” <http://keepingdemocracyalive.com/critical-race-theory-scopes-trial-redux/>.

<sup>3</sup> Virginia Heffernan, “How to Stop Worrying that CRT Will Corrupt Your Kids,” *The Los Angeles Times*, August 20, 2021, <https://www.latimes.com/opinion/story/2021-08-20/critical-race-theory-parents-school-boards-teachers>.

<sup>4</sup> See for example Carlson’s broadcast on September 27<sup>th</sup>, 2021, which excoriated National Institutes of Health Director Anthony Fauci and suggested that people who get vaccines and follow mask mandates are turning Fauci into an object of religious worship.

worked for The Discovery Institute, the main institutional proponent of intelligent design, makes this analogy especially convincing.<sup>5</sup> Hence, although the anti-evolution, creation science, and intelligent design movements were all ultimately defeated – at least in the courtroom – studying the rhetorical and linguistic dynamics of the anti-expert stance that these movements articulated offers a means to understand – and ultimately combat – the anti-expert stance now so widely prevalent in American public discourse.

These observations, which correlate racist and other regressive political attitudes with a generally oppositional stance toward expertise, seem consonant with a recent survey of over 2,000 Americans that has found that an individual’s acceptance of scientific consensus on specific issues like evolution and global warming to be a “powerful, and sometimes the most powerful, predictor of conforming to expert consensus on scientific issues”<sup>6</sup> in general despite “decades of opposition from the scientific community in educational and legal arenas” to the many variations of creationism, through which evolution opponents typically articulate their resistance.<sup>7</sup> Specifically, belief that *no* scientific consensus on evolution exists has been found to positively correlate with both rejection of the actual scientific consensus on evolution and the scientific consensus on other issues.<sup>8</sup> However, while more than enough scholarly and popular work has focused on directly responding to the anti-intellectual claims of right-wing activists and politicians, this dissertation studies how the rhetoric of the anti-evolution, creation science, and

---

<sup>5</sup> See Sarah Jones, “How to Manufacture a Moral Panic,” <https://nymag.com/intelligencer/2021/07/christopher-rufo-and-the-critical-race-theory-moral-panic.html>, for a discussion of the relationship between the ID movement and the anti-CRT movement.

<sup>6</sup> Joshua Tom. “Social Origins of Scientific Deviance: Examining Creationism and Global Warming Skepticism,” *Sociological Perspectives* 61, no. 3 (2018): 342.

<sup>7</sup> *Ibid*, 344.

<sup>8</sup> *Ibid*, 351.

intelligent design movements innovated the anti-expert rhetorical stance now so prominent in American discourse.

These movements demand attention not only because they innovated many of the tropes and argumentative frames now observable in anti-expert rhetoric, but also because they have persisted and changed even as the word “evolution” has seemingly gained much cultural ground since the anti-evolution heydays of the 1920s. In the 2020s, evolutionary concepts and metaphors prevail in American technical, popular, and political discourse to such an extent that they go practically unnoticed. “The idea of evolution,” as rhetorical theorist Thomas Lessl puts it, “is tied up with the very idea of science” in contemporary American society to such a degree that the promotion of the former constitutes promotion of the latter and, conversely, attack on the former constitutes attack on the latter.<sup>9</sup> This contention is supported by recent discourse analysis of American press coverage of the clash between proponents of intelligent design and Darwinian evolution,<sup>10</sup> which reveals how “through metonymic linking, an attack on evolution is often also construed as an attack on science.”<sup>11</sup> Despite scientists function as the archetypical “experts” to educated and uneducated people alike and the numerous legal victories attained by evolution’s proponents over the last century, recent work on the debate over evolution’s role in American public schools reveals that, when experts’ opinions contradict public opinion as it does with respect to evolution’s role in the biology curriculum, expert opinion does not achieve the same monopoly over the components of state curricula as when expert opinion and public opinion

---

<sup>9</sup> See Thomas Lessl, *Rhetorical Darwinism: Religion, Evolution, and the Scientific Identity*, (Baylor University Press: Waco, TX 2012), 3 for a discussion of this issue that connects it to the competition for patronage between scientific and religious institutions.

<sup>10</sup> Shala Barczewska. *Conceptualizing Evolution Education: A Corpus-Based Analysis of US Press Discourse*. (Cambridge Scholars Publisher: Newcastle upon Tyne, UK, 2017): 220.

<sup>11</sup> *Ibid*, 299.

concur.<sup>12</sup> In making room for public opinion in the curriculum, antievolution and creation science movements have constructed a “conspiracy-populist frame and a revealer stance” in order to “sketch a lifeworld that envisions elitist “secular” actors suppressing scriptural authority and creationists as humble, clear-eyed people exposing the conspiracy through scriptural fidelity.”<sup>13</sup> By studying the historical and contemporary legal discourses of antievolutionism, creation science, and intelligent design, then, I investigate both the general questions associated with the rhetoric and discourse of expertise and how a specifically anti-expert discourse strategy can contribute to a movement’s historical and contemporary success.

In doing so, I unite rhetorical questions with linguistic methodologies, specifically those of discourse analysis. Although it has been nearly sixty years since Wayne Booth’s *College Composition and Communication* address calling on scholars to begin studying the relationship between linguistic concepts and rhetorical functions, work pursuing such goals remains far from the norm.<sup>14</sup> Fortunately, outside of rhetorical studies significant work has been on the linguistic concept of modality and the philosophical conceptualization and argumentative function of expertise, experts, and the appeal to expertise, with particular attention paid to the role that expert witnesses play in American courts. More recently, James Hikins and Richard Cherwitz have encouraged “citizen-scholars” to investigate the “critical junctures...[where] academic specialties and particular communities and stakeholders meet and invite transdisciplinary

---

<sup>12</sup> See Michael Berkman and Eric Plutzer. “Scientific Expertise and the Culture War: Public Opinion and the Teaching of Evolution in the American States.” *Perspectives on Politics* 7, no. 3 (2009): 493 for a discussion of this discrepancy’s impact on state-level education policy and more general public discourse.

<sup>13</sup> James S. Bielo, ““Particles-to-People. . .Molecules-to- Man”: Creationist Poetics in Public Debates,” *Journal of Linguistic Anthropology* 29 no. 1 (2019): 6.

<sup>14</sup> Wayne Booth, “The Rhetorical Stance,” *College Composition and Communication*, 13, no. 3 (October: 1963): 140.

solutions.”<sup>15</sup> In this study, I respond to both of these calls, bringing the rhetorical stance together with what linguists have recently called the “epistemic stance.”

I write this dissertation to investigate the relationship between what Booth called “the rhetorical stance,” defined as “a proper balance among the three elements that are at work in any communicative effort: the available arguments about the subject itself, the interests and peculiarities of the audience, and the voice, the implied character, of the speaker”<sup>16</sup> and what been more recently identified as the “epistemic stance.” Although Booth used the concept primarily in a normative sense, in this dissertation, I develop the rhetorical stance as a descriptive concept by studying how expressions of epistemic modality contribute to the development of what recent linguists have called the “epistemic stance,” defined as “the degree of certainty concerning the object of discussion” expressed by a speaker.”<sup>17</sup> In this word frequency analysis of expert witness legal testimony in *Scopes v. Tennessee*, *McLean v. Arkansas*, and *Kitzmiller v. Dover*, three American legal cases concerned with controversies over teaching Darwinian evolution, creation science, and intelligent design in public schools, I articulate the epistemic stance as a component of the rhetorical stance. Particularly, I show how the speaker’s implied character, what Booth somewhat fuzzily called the speaker’s “voice,” can be understood as, at least in part, a function of the speaker’s apparent epistemic stance. In doing so, I not only seek to fulfill Booth’s long under heeded call to study the relationship between linguistic concepts and rhetorical functions, I also seek to contribute to recent discussions in rhetoric, linguistics, and

---

<sup>15</sup> James Hikins and Richard Cherwitz. “On the Ontological and Epistemological Dimensions of Expertise: Why ‘Reality’ and ‘Truth’ Matter and How We Might Find Them.” *Social Epistemology* 25, no. 3 (2011): 304.

<sup>16</sup> *Ibid.*, 141.

<sup>17</sup> See Massimo Chindamo, Jens Allwood, and Elisabeth Ahlsen, “Some Suggestions for the Study of Stance in Communication,” *2012 International Conference on Privacy, Security, Risk and Trust and 2012 International Conference on Social Computing* (2012), 619 for a review of some of the different general definitions of stance along with some of the different specific definitions of epistemic stance that have been offered throughout the last forty years of the linguistic literature.

philosophy dealing with the nature of expert authority, the role of experts of in argumentation, and, most specifically, the ways in which non-experts adjudicate between the testimony of competing experts. More particularly, I argue that the controversy often alleged to be at the heart of these three cases and that has formed the typical frame of scholarly discussion of these three cases, the supposed conflict between science and religion—a frame known as the “conflict thesis”—can be reimagined as a conflict not between the concepts of science and religion, but as an rhetorical conflict between competing frames in which rhetors conceptualize and perform expertise, forms that are often embodied in institutions, such as courts, churches, and universities, that are themselves frequently at odds socially, politically, and economically.

### **The Status and Power of Experts in the 21<sup>st</sup> Century**

Although scholars and journalists alike have recently proclaimed the present era the age of fake news and alternative facts, the priestly class of rhetors that English speakers call “experts,” continues to regulate, dictate, and subordinate the lives of virtually every person on the planet. In public and private, political, and professional life, people respond to and depend upon the recommendations of trained professionals to whom, on account of their specialized training, knowledge, and skill, virtually every society and government has urged special deference be given. Scientific experts, perhaps owing to the widespread presumption that “science” equals “progress,”<sup>18</sup> display what Lessl somewhat paradoxically calls a “priestly ethos,” a mediating role between the knowledge that makes modern life possible and the mass of non-scientists who depend on them. “Cultures,” as he puts it, “elevate certain individuals as priests because they regard them as uniquely equipped to receive and interpret sacred signs,

---

<sup>18</sup> See Richard Weaver, *The Ethics of Rhetoric*, (Routledge: New York, 2009): 215-216 for an early discussion of how “progress” and “science” have been linked and hypostatized.

messages thought to emanate from the source of all being and value.”<sup>19</sup> Even a highly industrialized, scientific culture like ours needs individuals to fulfill this function. Indeed, that may be the point, “for a culture strongly under the spell of naturalism, in which there is no being that is not identical with the reality of the natural universe, science is likely to assume this role simply because it assumes such authority once the natural world has moved into the position vacated by God.”<sup>20</sup> In other words, one might not implausibly argue that science enjoys in the 21<sup>st</sup> century prestige roughly analogous to that enjoyed by theology in the 13<sup>th</sup> century.

Though it might be tempting, not to mention justifying of many aspects of contemporary social arrangements, to view this apparent role reversal as an inevitable outcome of the scientific revolution, such a view requires ignoring significant developments in the history of science. The growth of expert authority in general and scientific expertise in particular, both of which seems only to be growing despite the 21<sup>st</sup> century challenges they face, has roots in the 18<sup>th</sup> and 19<sup>th</sup> century movements toward specialization in various fields, especially those in chemistry, physics, and biology. As “increasingly opaque and impenetrable boundaries around science interrupted its continuity with other realms,” says historian of science Daniel Patrick Thurs, “the cultural prestige of science flowed more and more from its comparisons and contrasts with other sorts of information about the world.”<sup>21</sup> Significantly, the trend toward specialization and the increasing separation of technical, scientific discourse corresponded with the emergence and development of Darwin’s theory of evolution throughout the 1860s and 70s.<sup>22</sup> At the same time, distinctions between “those who pursued science and other kinds of individuals and groups”

---

<sup>19</sup> Lessl, *Rhetorical Darwinism*, 16.

<sup>20</sup> Ibid.

<sup>21</sup> See Daniel Patrick Thurs. *Science Talk: Changing Notions of Science in American Popular Culture*, (Rutgers University Press, 2007): 4.

<sup>22</sup> Ibid, 81.

began to emerge.<sup>23</sup> By the 20<sup>th</sup> century, science's contributions to technology, medicine, and industry, not to mention general knowledge, had hoisted its relevant fields to a nearly impregnable position the top of the disciplinary and epistemological hierarchy.

As the 21<sup>st</sup> century enters its second decade, experts spanning the whole range of recognized academic fields, even spilling out into those fields of more dubious reputation, pontificate on the nightly news, make policy recommendations to legislative bodies, and testify in court with such frequency that their omnipresent authority in public discourse often feels as natural as the sunshine of a spring day. Few experts, however, enjoy as much authority as scientific experts, though even their role has increasingly faced scrutiny and criticism inside and outside academia, which the ongoing controversy over COVID-19 policies has put into stark relief.<sup>24</sup> Indeed, the presence of scientific experts draws explicit attention most particularly when experts fail to accurately predict something, disagree among themselves, or face scrutiny by some civic or, more rarely, media institution.

Examples of the increasing attention—and criticism—paid to scientific experts and the notion of scientific expertise around the world and in the United States have abounded throughout the last decade. In 2012, for example, an Italian judge drew international criticism, including condemnation from The American Association for the Advancement of Science, after a group of six scientists along and a civil defense official were convicted of manslaughter following what was purported to be their failure to accurately predict an earthquake in L'Aquila,

---

<sup>23</sup> Ibid, 5.

<sup>24</sup> See for instance, Gary Saul Morrison, "Partisan Science in America," *The Wall Street Journal*, October 11, 2021, <https://www.wsj.com/articles/partisan-science-antiscience-facts-misrepresentation-fauci-lancet-lab-leak-11633960740> for a recent criticism of the scientific establishment's supposed role in "silencing dissent" over the origins of COVID-19.

Italy, a trial that has been covered both by the popular press and by rhetoricians of expertise.<sup>25</sup> Similarly, the failure of experts of all kinds to predict the results of the 2016 United States Presidential election has caused some to question whether we live in a “post-truth” or “post-fact” era, a trend that raises fundamental questions about what counts as and, more importantly, who decides what gets counted as knowledge. Recent public health controversies such the Ebola panic of 2014 or the ongoing COVID-19 pandemic, meanwhile, raise important questions not only about how experts communicate with non-experts and about how people compare the ideas of competing experts to one another, but also about the very legitimacy of expert opinion in contemporary social, political, and economic life.<sup>26</sup> But what makes an expert an expert in the first place? How can and should people facing what Lloyd Bitzer, one of the most prominent America rhetoricians of the 20<sup>th</sup> century, calls an exigence, an “imperfection marked by urgency” determine which experts to trust and when to trust them?<sup>27</sup> Furthermore, how do experts themselves attempt to persuade non-experts and their colleagues when faced with questions for which no consensus exists, but for which a decision must be made?

These questions, which would be interesting in less polemical times, seem especially urgent in the wake of the recent surfeit of popular and scholarly literature challenging “the rule

---

<sup>25</sup> David Ropeik, “The L Aquila Verdict: A Judgment Not against Science, but against a Failure of Science Communication,” *Scientific American*, October 22, 2012, <https://blogs.scientificamerican.com/guest-blog/the-laquila-verdict-a-judgment-not-against-science-but-against-a-failure-of-science-communication/>. See also Daniele DeVasto, “Being Expert: L’Aquila and Issues of Inclusion in Science-Policy Decision Making,” *Social Epistemology* 30, no. 4, (August 2016): 372-397 for a scholarly analysis of the perception of expertise in the L’Aquila trial.

<sup>26</sup> Carrie Miller, “Why Don’t Americans Trust Experts?,” *The Daily Circuit*, Minnesota Public Radio, October 19, 2014, <https://www.mprnews.org/story/2014/10/20/daily-circuit-trusting-experts>. In the time of COVID-19, this discussion has been even more consequential, as right-wing news sources routinely sowing doubt in established experts. See, for instance, James Freeman, “The Limits of Anthony Fauci’s Expertise,” *The Wall Street Journal*, May 13, 2020, Opinion, <https://www.wsj.com/articles/the-limits-of-anthony-faucis-expertise-11589392347>.

<sup>27</sup> Lloyd Bitzer, “The Rhetorical Situation,” *Philosophy and Rhetoric* 1, no. 1 (Jan 1968): 6, <https://www.jstor.org/stable/40236733>.

of experts, in which monopoly experts decide for non-experts”<sup>28</sup> alongside the more general intellectual and political populism ascendant recently in The United States and other countries around the world.<sup>29</sup> Such works posit that certain kinds of expertise, such as the expertise of scientists, social workers, and others — perhaps not coincidentally associated with designing government (usually Federal) policy — constitute a monopoly on an intellectual market that, ideally, would be open to other experts and even the opinion of non-experts. In short, these works begin by assuming that there is no such thing as *neutral* expertise and that the presentation of expertise as such is just one of the many rhetorical conceits associated with the concept. As the competence, authority, and power of doctors, scientists, lawyers, social workers, and teachers — to name just a few professions — face increasing scrutiny, scholars as much as anyone risk their own social capital if they neglect the philosophical, linguistic, and rhetorical questions clustered around the concept of expertise and the figure of the expert. Responding to these challenges requires the thoroughgoing examination of the rhetorical, philosophical, and linguistic dimensions of expertise which, although previously considered separately by scholars across these three respective fields, have only tangentially been considered as a whole.

This dissertation attempts such a synthesis by exploring how expert witnesses, who are a relatively recent arrival to Common Law courts,<sup>30</sup> strategically negotiate the difference between the categories of certainty and uncertainty, possibility and necessity, in their use of English

---

<sup>28</sup> Roger Koppl, *Expert Failure* (Cambridge: Cambridge University Press, 2018): 6.

<sup>29</sup> See David Freeman, *Wrong: Why Experts Keep Failing Us—and How to Know When Not to Trust Them*, New York: Little, Brown and Co., 2010 for a journalistic take on this perspective.

<sup>30</sup> Tal Golan, *Laws of Men and Laws of Nature*, (Cambridge: Harvard University Press, 2004), 5-7, traces the first appearance of what would today be called expert witness in English-speaking courts to the 1782 civil case of *Folkes v. Chadd*, in which scientists were called by litigants to testify as to the causes of a harbor’s degradation. This is not an uncontroversial dating, though. In the rest of this monograph Golan discusses how, throughout the 19<sup>th</sup> century, the role of the expert witness, the scope of his authority, and the scrutiny received all grew commensurately as experts helped to settled disputes in chemistry, patent law, and other technical subjects that had developed along the burgeoning natural sciences.

modal verbs, words like “can,” “may,” and “will” that can qualify a speaker’s stance toward the content of their statements.<sup>31</sup> Specifically, I examine how experts’ use of modal verbs has changed over roughly the last century as they have gone to court on various occasions to debate the role of Darwinian evolution, creation science, and intelligent design in American public schools. These controversies, which have in the last century changed as much as the role of experts in American public life and expert witnesses in American courtrooms have changed, offers a useful case study in the linguistic, philosophical, rhetorical, dimensions of expertise because they reveal how specific grammatical categories contribute to how experts construct their “epistemic stance” on the witness stand.

On account of the first case that I examine, 1925’s *Scopes v. Tennessee*, many Americans now view the general relationship between science and religion through what scholars have called “the conflict thesis,” which posits that a fundamental conceptual antagonism exists between “science and religion,” broadly construed. The second case examined here, 1981’s *Mclean v. Arkansas*, not only turned the legal tides definitively against anti-Darwinians and their allies in the “creation science” movement, it also established, via the oft-cited ruling of its judge, William T. Overton, a “legal definition” of science informed by the testimony of expert witnesses, specifically philosophers of science. Significantly, Overton’s definition was later employed by Judge John E. Jones in 2005’s *Kitzmiller v. Dover*, the final case examined here, to determine that intelligent design, a more contemporary offshoot of creation science, does not

---

<sup>31</sup> See Frank Palmer, *Modality and the English Modals*, (New York: Longman, Inc., 1990) for a foundational monograph on the relationship between these logical categories and the grammar of the English modals. See especially chapter three of the same volume for a useful discussion of epistemic modality and the grammar of the epistemic modals.

meet the definition of science required to be taught in public schools. In all three of these cases, the presence, absence, and constitution of expert testimony played a major role in determining the outcome of the case, and, consequently, the kind of educations students attending American public high schools have received and will receive. Furthermore, while these cases present interesting problems for the scientist and the jurist, they present equally interesting problems for the philosopher, linguist, and rhetorician, highlighting as they do the general epistemic problem of testimony, the semantic ambiguity of modal verbs, and the persuasive appeal of expert authority.

For the last forty years, scholars across rhetoric, linguistics, philosophy, and law have devoted their various conceptual and methodological resources to defining, theorizing, and investigating the problems entailed by the contemporary cult of expertise.<sup>32</sup> At the same time, changes in the evidential standards governing the admission of expert witness testimony American courtrooms, compounded by the increasingly rapid pace of scientific and technological advancement around the world, have raised new and difficult linguistic, rhetorical, and philosophical questions.<sup>33</sup> What distinguishes the sciences from other fields? Should judges or scholars determine whether or not a given idea merits recognition as “science”? How does the adversarial atmosphere of the American courtroom reinforce the myth that scientists speak with

---

<sup>32</sup> See John Hardwig, “Epistemic Dependence,” *The Journal of Philosophy* 82, no. 7 (Jul 1985): 335 – 349, <https://www.jstor.org/stable/2026523> for an early look at the basic philosophical problem associated with trusting experts.

<sup>33</sup> In particular, *Daubert v. Merrell Dow Pharmaceuticals*, 509 U.S. 579 (1993), *General Electric Co. v. Joiner*, 522 U.S. 136 (1997), and *Kumho Tire Co. v. Carmichael*, 526 U.S. 137 (1999), collectively known as “the Daubert Trilogy,” transformed the Federal standards of evidence regarding the admission of expert witness testimony from the long held to Frye rule to the Daubert Standard, the set of rules that prevail to this day.

absolute certainty? These questions merely broach the issue. Although rhetoricians, linguists, philosophers, lawyers, journalists, and other professionals have all greatly contributed to how scholars understand the problems entailed by contemporary American culture's dependence on expertise, no work has brought together their various questions, concerns, and methodologies. The present work proposes to fill this gap by borrowing questions from philosophy, concepts from rhetoric, and methods from linguistics to investigate how these questions have manifested themselves across the nearly century-long legal battle waged over the teaching of evolution in American public schools. Focusing on the philosophical, linguistic, and rhetorical problems of the three cases mentioned earlier, this dissertation likewise hopes to highlight intersections of these fields with the domains of science and the law and to argue that scholarship broadly interdisciplinary in its scope while narrowly focused in its methods – scholarship such as the present dissertation – offers the ability to answer questions as puzzling and concerning to citizens as to scholars.

By comparing how scientific expert witnesses use English epistemic modals to modify their claims in the construction of their epistemic stance, I connect the sentence-level linguistic features of English with discourse-level rhetorical strategies.<sup>34</sup> Accordingly, I unite the concept of the rhetorical stance with that of the epistemic stance in order to ask the following questions: 1) How do changes in the use of modals create the various “epistemic stances” that witnesses take toward the questions of their respective academic fields and how those fields inform the arguments which experts make in courts? 2) How does the epistemic stance of an expert witness

---

<sup>34</sup> A number of studies in the last twenty years have prefigured what I have attempted to do here. See Gail Stygall, “A Different Class of Witnesses: Experts in the Courtroom,” *Discourse Studies: An Interdisciplinary Journal for the Study of Text and Talk* 3, no. 3, (2001): 327-349 for an early study of the rhetorical effects of expert testimony, specifically as applied to the famous trial of OJ Simpson.

function as a rhetorical stance? 3) What does the rhetorical function of the epistemic stance reveal about the relationship between epistemic stance, English modal verbs, and discourse strategies? Envisioning the courtroom as just one of the many scenes of contemporary life in which scholars may observe the problems posed by our dependence on experts, I use these questions to explore the more general relationship between rhetoric, linguistics, philosophy, and the law, a relationship which philosophers and rhetoricians alike have characterized as tense ever since Socrates first sat down with Gorgias.

To answer these questions, this dissertation offers a type-token analysis of expert witness testimony in three cases famous both for their role in shaping the science curriculum of American public schools and for their role in shaping Americans' perceptions of the general relationship between science and religion. First, in 1925's *Scopes v. Tennessee*, ominously labeled by contemporary high school history books as "The Scopes Trial," the State of Tennessee successfully fined high school biology teacher John. T. Scopes \$100, then a sizable sum, for teaching Darwin's theory of evolution to his high school class. Although this case has entered history books as an emblem of the inherent conflict between science and religion the documentary history and testimony of the case presents a far more complicated story.<sup>35</sup> In the second case, 1981's *McLean v. Arkansas*, fundamentalists embittered by their receding cultural influence sought to legislate "equal time" for Darwinian evolution and so-called "creation science," a theory first promulgated in the 1960's that purported to explain human origins in simultaneously creationist and naturalistic terms. This case remains especially notable because, in his decision, Judge William Overton drew upon expert witness testimony to construct a five-

---

<sup>35</sup> Alan Brinkley, *The Unfinished Nation: A Concise History of the American People*, (New York: McGraw-Hill Education, 2016), 558 for one example of a currently used American history textbook that promotes this narrative. This is the textbook currently used by the Bellevue School District in Washington State.

pronged “definition” of science to which judges continue to appeal today. Finally, 2005’s *Kitzmiller v. Dover*, the Court of the Middle District of Pennsylvania, directly citing Overton’s definition of science, ruled in favor of a group of parents who had sued the Kitzmiller Area School District for introducing the controversial notion of “intelligent design,” whose proponents claim that life “began abruptly through an intelligent agency with their distinct features intact,” into its biology curriculum. With the parents contending that the school district had violated the Establishment Clause, the case drew national attention because, in order to arrive at its ruling, the Court had to determine the boundaries between the sciences and other disciplines.<sup>36</sup> Expert witness testimony played a major evidentiary role in all three cases. Consequently, studying the testimony offered in each case allows us to observe not only how experts have constructed their authority in general, but also how the strategies experts use to construct their legal authority has *changed*, particularly in the days since The Daubert Rule, the current standard of expert testimony in the Federal courts, has replaced the older Frye Rule, first adopted in 1923, which held force in both State and Federal courts throughout most of the 20th century. Drawing on contemporary principles and methods of corpus linguistic analysis, this dissertation compares the ways in which expert witnesses in these cases used the eight epistemic modal verbs of English to modify their epistemic stances, and thereby their rhetorical stances, in their testimony.<sup>37</sup> Specifically, it investigates how shifts in their “epistemic stance,” the degree of relative commitment they evince relative to a given statement, constitute changes in their “rhetorical stance,” the speaker’s overall attitude and position in the discourse. Thinking of testimony as a

---

<sup>36</sup> The Establishment Clause of the United States Constitution prohibits Congress from “respecting an establishment of religion.” Significantly, it was not until more than twenty years after the Scopes Trial that the Establishment Clause was “incorporated,” or made binding, on state law in addition to Federal law.

<sup>37</sup> For principles of corpus construction, cleaning, and analysis, including instruction on how to use the corpus-analysis tool AntConc, I consulted Martin Weisser, *Practical Corpus Linguistics: An Introduction to Corpus-Based Language Analysis*, (Oxford: Wiley Blackwell, 2016).

“speech act” in the sense described by Austin and Searle, I investigate how the *performance* of degrees of certainty impacts both the success of a given expert’s side of litigation and the more general problem that all citizens face when they encounter the often daunting dictates of experts: whom should you trust, to what degree should you should trust them, and why?<sup>38</sup> Moreover, these three cases offer not only general consonance with the philosophical, legal, and rhetorical problems of expertise but also insight into a problem at once very old and very new: how can we reconcile the fact of what Hardwig calls “epistemic dependence,” which so structures our lives that any pretense to individual epistemic autonomy collapses under its weight, our desire for epistemic independence? To wit, consider how many contemporary Americans talk about coders and computers much in the same way that medieval persons might have thought about wizards and magic. If, as members of a democratic republican polity and an advanced consumer society, Americans wish to become “informed,” however one defines that dubious category, then both the general and the particular role of experts in our lives demands the kind of scrutiny that this dissertation provides.

### **Defining Expertise and Becoming an Expert**

While different disciplines may share questions, scholars from disparate fields each bring their own motives, assumptions, and methods for studying the problems of expertise. Indeed, a scholar new to the study of expertise will encounter, perhaps before anything, a literature on expertise and experts that includes not only philosophy, linguistics, rhetoric, and law, but also economics, forensic science, sociology, and psychology, to name just a few fields whose

---

<sup>38</sup> See J.L Austin, *How To Do Things with Words*, (London: Oxford University Press, 1961) and John Searle, *Speech Acts: An Essay in the Philosophy of Language*, (Cambridge: Cambridge University Press, 1969). It also seems appropriate to think of testimony in this sense because those who have studied modal verb use in corpora have likewise construed modal verb use in terms of speech acts. See, for instance, Palmer, *Modality and the English Modals*, 7 and 22.

practitioners have concerned themselves with the problems of expertise.<sup>39</sup> While scholars have sought to define *expertise* as a general concept and *the expert* as a social actor, few have attempted to bring the general and the particular together to study the linguistic and rhetorical problems inherent in the privileged social position experts occupy when acting in their “official” capacities. Before yoking philosophy, linguistics, rhetoric, and the law together, then, an overview of the psychological, sociological, and economic literature on expertise will illustrate not only the challenges inherent in articulating a general definition of expertise but also the significance of approaching communicating expert knowledge as one of the problems entailed by some of the most basic problems in philosophy, rhetoric, and linguistics. Indeed, some of these problems involve debates that have been ongoing since these disciplines were first practiced.

The psychological attempt to define expertise begins with the readily available observation that people with specialized knowledge of a given subject think, talk, and behave differently than people lacking specialized knowledge of that subject. A person playing chess or golf for the first time, for instance, will apprehend, verbalize, and perform the task at hand in ways substantially different from those deployed by people with even only a few hours of formal training and practice. The psychological study of expertise, which emerged as a subfield of the general study of intelligence, began with this observation. From the 1950s to the 1980s, developments in artificial intelligence and cognitive science combined with the demands of designing instruction for the mass-education system of industrial nations like The United States led psychologists to develop general theories of expertise and experts.<sup>40</sup> The earliest researchers,

---

<sup>39</sup> The same fact that creates this problem, though, also suggests the need for a broad, interdisciplinary study of expertise. Scholars in various fields have, on their own, isolated a number of interesting lines of investigation, including how long it takes someone to become an “expert,” why people trust so-called experts, and what role experts play in human decision-making (the point at which the question becomes rhetorical).

<sup>40</sup> See Feltovich, Paul J., Michael J. Prietula, and K. Anders Ericsson, "Studies of Expertise from Psychological Perspectives: Historical Foundations and Recurrent Themes" in *Cambridge Handbook of Expertise and Expert*

utilizing what psychologists now call the “expert-novice” approach, attempted to understand how the performance of an expert, defined through such features as credentials, formal training, and years of experience, differs from novices similarly defined through their absence of credentials and training.

Researchers utilizing the more recent “expert performance” approach pioneered in 1991 by K. Anders Ericsson, however, focus on understanding the “reproducibly superior performance on representative tasks that capture expertise in a domain,” such as making a move in chess or swinging a golf club. Anderson and subsequent others found that the primary difference between the “most expert” performers of these representative tasks was not some generalizable intelligence as measured by something like IQ, but the amount of time spent in deliberate practice of the relevant tasks.<sup>41</sup> Without allowing us to dismiss the role played by such factors as aptitude, Ericsson’s work suggests that Quintillian’s old dictum that “repetition is the mother of memory” holds as true for contemporary Americans as it did for imperial Romans. More importantly, this work suggests expertise to be a far more fluid, malleable concept than that suggested by the “expert novice” approach, which assumes that expertise, once attained, places almost impermeable barriers between the expert and the novice.

### **Debates about the Authority of Experts and the Rising Power of Epistemic Populism**

Just as psychologists have studied the cognitive nature of expertise, prominent failures of experts combined with the global rise of populist political programs have given rise to

---

*Performance*, edited by K. Anders Ericsson, Robert R. Hoffman, and Aaron Kozbelt. 2nd ed. Cambridge University Press, 2018.

<sup>41</sup> See K. Anders Ericsson and Jacqui Smith *Toward a General Theory of Expertise: Prospects and Limits*. Cambridge; New York: Cambridge University Press, 1991 for the first wave of studies utilizing the expert performance approach. Since this initial study, however, Ericsson’s approach has become the most typical perspective used in research on expertise such that most work on the subject today takes his work for granted.

a body of literature alternatively seeking to attack or defend the sociological role played by expertise and experts. Consequently, the social role of experts has been both seriously scrutinized and vigorously defended. Some contend that giving experts the power to make decisions at such a broad scale necessarily results in the erosion the individual freedom necessary to a functioning democratic society. Others argue that the worldwide technological and epistemic changes wrought by technologies such as the Internet have made people in greater need of expert opinion than ever before. Both attacks on and defenses of experts and expertise, though, are articulated as responses to the rise of epistemic and political populism, one of the signatures of 21<sup>st</sup> century discourse in the United States.

Throughout the last decade in particular, journalists and scholars alike have attempted to attack or defend the deference afforded to experts. Laying blame for the breakdown in expert authority on such typical sources as universities, the Internet, and the media, defenders of experts and expertise contend that barriers between experts and novices function as important, even life-saving controls on the quality of knowledge employed by political, cultural, or other economic actors in making decisions for the people whom such experts represent. Some lament that “Americans now believe that having equal rights in a political system means that each person’s opinion about anything must be accepted as equal to anyone else’s” and even link distrust or antagonism toward experts as a threat to civilization itself.<sup>42</sup> On the other side of this debate, meanwhile, focus on the potential of experts to abuse their power over individuals, create monopolies on knowledge, and unduly influence public policy.<sup>43</sup> Recounting horror stories, such

---

<sup>42</sup> See Thomas Nichols, *The Death of Expertise: The Campaign Against Established Knowledge and Why It Matters*, (New York: Oxford University Press, 2017), 5 for a contemporary articulation of this view. In particular, Nichols on p. 3 of the same book complains that the United States faces a “Google-fueled, Wikipedia-based, blog-sodden collapse of any division between professionals and laypeople.” This somewhat histrionic depiction of the problem, though, does lend itself to easy caricature.

<sup>43</sup> Roger Koppl, *Expert Failure*, articulates this view. Drawing on what he calls “information choice theory,” Koppl discusses the problem of experts from the perspective of a consumer seeking to maximize the reliability of expert

as those of children unjustly removed from parental custody by social workers or of judges taking kickbacks from private prisons, critics of experts and expertise, who might define an expert loosely and broadly as a person “who is paid for their opinion,” depict expertise as an amorphous concept and experts as self-interested economic actors.<sup>44</sup> Staking out these extreme positions, defenders and critics of experts both come armed and ready with numerous anecdotes of death, destruction, and chaos caused by affording either *too little* or *too much* authority to experts.

Such attacks on and defense of expertise have emerged even as the stance of “epistemic populism” have been articulated along the more recent worldwide ascension of political regimes that deploy populist rhetoric in such countries as Brazil, Turkey, and, of course, the United States. While the term populism has long been used to refer to a broad range of political ideologies that schematize the world as a conflict between “the common people” and “elites,” the term “epistemic populism” refers to the more recently observed phenomenon of people rejecting the advice and legitimacy of established experts and institutions on a large scale. Trust in expert advice and established institutions is replaced in favor of either epistemic individualism, wherein each person is posited as equally capable of adjudicating technical disputes “for one’s self” or, perhaps the more prominent manifestation of epistemic populism, conspiracy theories in which the morally pure people uncover the hidden machinations of the elites, whichever form those

---

advice while minimizing the amount of control that experts have over their lives. Koppl divides views on the relationship between experts and non-experts into four basic categories: reliable-powerless, reliable-empowered, unreliable-powerless, and unreliable-empowered. Through this taxonomy, he characterizes the views of scholars as diverse as Plato, Frederik Hayek, and Michel Foucault. Koppl views competition among experts as a good thing and the opinions offered by experts as one of many goods that consumers must choose between. Consequently, Koppl does not necessarily view the rejection of expert advice as quite the threat to civilization that Nichols sees it as.

<sup>44</sup> Ibid, 2-3.

groups happen to take.<sup>45</sup> Populist rhetorical, political, and epistemic themes played a prominent role in *Scopes v. Tennessee*, *McLean v. Arkansas*, and *Kitzmiller v. Dover*, the three cases studied in this dissertation, and, consequently, they offer a way to examine the long-term development of the rhetoric of populist movements, particular with respect to how they position themselves epistemically. As Taner Edis observes, while many look to the rise of the Nazis in Germany or the Fascists in Italy to understand contemporary right-wing populist movements, anti-evolutionism, creation science, and intelligent design might offer better examples because these movements better embody “a populist revolt against secular expertise, aiming to delegitimize liberal elites, that draws on and supports religiously-colored pseudosciences” than do the extremely easy-to-caricature comparisons to the Nazis and Fascists frequently made by critics of right-wing populist movements.<sup>46</sup> Indeed, because these movements and the legal controversies they generated offer especially compelling examples of cases in which “fact claims also become markers personal identity and belonging,” it is not enough for defenders of expertise to deploy “an academic style of critique.”<sup>47</sup> In other words, viewing the antievolution, creation science, and intelligent design movements as early iterations of conflicts between established expertise and epistemic populism helps to explain why, when dealing with the present critics of expertise, it is not enough to simply state what the real facts are and move on.

While expertise and experts present general problems for all people involved in a democratic society, expertise and experts also present more technical problems for philosophers,

---

<sup>45</sup> See Sven Engesser, Nayla Fawzi and Anders Olof Larsson, “Populist Online Communication,” *Information, Communication, and Society* 20, no. 9, (2017): 1279-1292 for a look at the online communication strategies used to facilitate populist political movements.

<sup>46</sup> Taner Edis, “A Revolt Against Expertise: Pseudoscience, Right-Wing Populism, and Post-Trust Politics,” *Disputatio* 9, no. 13, (2020): 8. This article offers a general way to view the creationism debate embodied in the anti- evolution, creation science, and intelligent design movements as a dispute about *who* can be called experts and *in which* fields one can be expert.

<sup>47</sup> *Ibid*, 12.

linguists, and rhetoricians to consider. While philosophers, for example, have dealt with questions of expertise as a problem in epistemology, linguists have dealt with these questions as problems entailed by the speech acts of *hedging* and the ways in which languages mark *evidentiality*. Rhetoricians, meanwhile, have dealt with expertise as a problem of constructing *ethos*, the time-honored Aristotelian category roughly corresponding to personal credibility. Meanwhile, lawyers and judges have dealt with the more practical implications of these questions, drawing upon these debates to adjudicate disputes and evaluate legislation seeking to establish rules by which Americans can outsource their epistemic judgment to experts without needing to worry about being deceived. The courtroom brings all of these different fields together; therefore, after reviewing how each individual field has considered the problems associated with expertise, I offer a brief legal history not only of the problem of expertise, but also of the last century of legal conflict concerned with teaching evolution. Finally, I conclude this opening chapter by sketching the method that I will use to investigate each case and outlining the remaining four chapters.

### **The Philosophical Problems of Expertise**

For more than two thousand years, philosophers have debated basic problems such as the definition of knowledge and how a claim may be justified, if at all. The general problems associated with testimony and the specific issues entailed by the appeal to expert testimony can best be understood within the parameters of these more basic problems. Like many of the problems grappled with by philosophers of rhetoricians, the contemporary discussions have emerged from parameters initially laid out by disputes in the classical era. Philosophers and rhetoricians alike, of course, will be familiar with the antagonism between Plato and the Sophists, so only a brief restatement of that dispute seems necessary here.

For Plato, the basic problems of epistemology are entailed in the attempt to define the concept of knowledge and the attempt to articulate a theory of justification. In his *Theatetus*, he attempts to deal with both problems. Offering a formulation that has remained a standard according to which other philosophers have defined their positions, Plato defines knowledge as “justified true belief.” In order to count as knowledge, a statement must not only be true and believed by a person, but that same person must also possess “an account” that adequately explains how that statement can be known.<sup>48</sup> Especially appropriate for the present purpose, Plato, speaking through Socrates, illustrates his point with an example drawn from the Athenian courtroom. Asking his friend Theatetus to imagine a jury, Socrates ponders how its members could be “justly persuaded of some matter which only an eye-witness could know, and which cannot otherwise be known; suppose they come to their decision upon hearsay, forming a true judgment: then they have decided the case without knowledge, but, granted they did their job well, being correctly persuaded?”<sup>49</sup> Put more simply, Socrates wants Theatetus to consider the difference between having *the right* answer to a question and having *the right* reasons for believing that answer. Since people can easily imagine a situation in which they have arrived at the right answer for *the wrong reason*, knowledge requires more than *just* true belief – it requires justification. It is significant, then, that for Plato, knowledge is something possessed by *individuals*. It is, additionally, significant that most of the other problems associated with the study of expertise are also anticipated by Plato.<sup>50</sup>

---

<sup>48</sup> Plato, “Theatetus” in John Cooper and DS Hutchinson, *Complete Works of Plato*, Indianapolis: Hackett Publishing Company, 1997, 223.

<sup>49</sup> *Ibid*, 224.

<sup>50</sup> See Jörg Hardy, “Seeking Truth and Taking Care for Common Goods—Plato on Expertise and Recognizing Experts”, *Episteme* 7, no. 1, (2010): 7-22 for a thorough look at Plato’s philosophy of expertise, including how Plato handles the problem of epistemic dependence and the problem of experts transferring their authority to other fields. If one wanted to argue that the philosophy of expertise consisted of footnotes to Plato, Hardy’s article would help one to do so.

Of course, pointing out the need for justification only points out the real source of the problem, the sources of human knowledge themselves. Along with intuition, observation, and deduction, testimony is one of the most basic sources that people rely on for knowledge. If, as pretty much everyone has experienced at one time or another, it is often difficult to rely on the accounts of others in the general course of life, as people can be mistaken of the truth, ignorant of it, or indeed, deliberately misconstrue it in their speech or writing, how much greater does that problem seem when a person is asked to rely upon the testimony of another for *specialized* information? Such is the basic epistemological problem posed by expert witness testimony.

This problem would not have surprised Plato's philosophical antagonists, the Sophists, who made the designation of knowledge an essentially rhetorical task, a social task. The Sophists believed that language determined people's perceptions, the sign the things signified, and so on. This view found advocates in early Sophists such as Corax and Tisias and had a particular impact on Athenian society through the famous teacher Protagoras. Though none of his writings survive, his contemporaries famously attributed to him the position that "man is the measure of all things," a statement as much about rhetoric as about epistemology. Despite the paucity of primary sources covering the early Sophists, one text, the anonymous *Dissoi Logoi*, illustrates their skeptical position well in its refrain "as the name differs, so likewise does the reality."<sup>51</sup> This amounts to a denial to several of Plato's key definitions and distinctions—his definition of knowledge, for instance, and especially his distinction between knowledge, belief, and justification. For the Sophists, there was nothing but *belief*. Instead of the dialectical power of justification, they offered the rhetorical power of *persuasion*.

---

<sup>51</sup> Anonymous, "Dissoi Logoi," in Patricia Bizzel and Bruce Herzberg, *The Rhetorical Tradition* 2<sup>nd</sup> edition, (Boston: Bedford/St. Martin's, 2001), 49.

Although the Sophist's position enjoyed brief prominence in the 5<sup>th</sup> century Athens that gave Protagoras and his descendants, such as Gorgias, fame, wealth, and suspicion in great measure, the Sophist's position would soon wither under the attacks of their enemies, especially those of Plato, Aristotle, and the Academic and Peripatetic schools that grew up around them. Although the Sophist's position did find a mirror in the Hellenistic school known as Pyrrhonian skepticism, other Hellenistic schools, such as the Epicureans and the Stoics, largely embraced variations of the Platonic or Aristotelian positions. Even Early Modern philosophers such as Bacon, Locke, Descartes, Berkeley, and Hume articulated their positions as confirmations of or deviations from Plato's theories of knowledge and justification.

The classical dispute between Plato and the Sophists set up the basic parameters through which contemporary philosophers debate issues such as the definition of knowledge, the problem of justification, and the appeal to expert testimony. Dealing with more the more specialized problems of testimony and, particularly, expert testimony, contemporary philosophers must grapple with the problem of epistemic dependence, distinguishing the expert from the lay person, and how expert testimony functions as a source of epistemic justification. Some, arguing from more-or-less Platonic concepts of knowledge, argue for discrete concepts of expertise, clear distinctions between experts and laypeople, and, ultimately, contend that expert testimony offers a reliable means for adjudicating the truth of claims. Others, arguing from assumptions more like those of the Sophist's, argue that the concept of expertise cannot be clearly defined and, consequently, that clear distinctions between experts and laypeople cannot be drawn or that such distinctions are mere social fabrications. According to this view, expert witness testimony falls victim to the same problems that other sources of justification fall victim to and, consequently, no more produces knowledge in the Platonic sense than those other sources.

Most of the problems associated with expert testimony stem from the basic problem of epistemic dependence. Put simply, pretty much everyone has beliefs for which they do not, *as individuals*, possess sufficient evidence to meet the Platonic standard of “justified true belief.” All individuals, even if they possess specialized knowledge in one field of knowledge, must defer to those with specialized knowledge in particular areas.<sup>52</sup> The ongoing dispute over getting the COVID-19 vaccine exemplifies this problem in a palpable, practical way.<sup>53</sup> Because the majority of Americans lack the specialized training to evaluate medical evidence and, even within biology and medicine no one individual has time or resources to *actually* evaluate all of the available evidence (even if a person who could potentially do so can be imagined), every American must, to some degree or another, choose whether or not to defer to the doctors, public health officials, and others who are encouraging Americans to get vaccinated. In choosing to defer or not to defer to these experts, Americans are effectively deciding whether or not to give these experts power over their lives. Therein lies the sting of epistemic dependence. To the extent that a person cedes epistemic autonomy to experts, that same person cedes, to one degree or another, a certain amount of power over their behavior. Consequently, epistemic dependence entails a certain degree of social dependence.

The degree to which philosophers consider this social dependence to be a problem depends largely on whether and how the distinction between the expert and the layperson is drawn. This distinction creates further problems, though, because an expert in one field will

---

<sup>52</sup> John Hardwig, “Epistemic Dependence”, 335, puts the impossibility of individually verifying our beliefs pretty plainly, saying: “I cannot imagine being able to do this for all of my beliefs. I believe too much; there is too much relevant evidence (much of it available only after extensive, specialized training); intellect is too small and life too short.”

<sup>53</sup> Which experts Americans trust, for example, seems to be a function of political party. See a summary of a recent Pew Research Center study in Margot Sanger-Katz, “On Coronavirus, Americans Still Trust the Experts,” *The New York Times*, June 30, 2020, The Upshot, <https://www.nytimes.com/2020/06/27/upshot/coronavirus-americans-trust-experts.html>.

necessarily be a lay person in another field, a fact reflective of the opportunity cost entailed by investing the time required to acquire expertise. While some make this distinction according to the relationship of an individual to a given domain of knowledge, others contend that expertise functions primarily as a social category, a label conferred upon an individual by society, a question, to return to a distinction drawn earlier, of *appearance* as much as if not more than reality. Goldman, for instance, distinguishes experts from lay people according to three criteria that relate an individual expert to the subject of their field. He points first to experts' knowledge relative to a specific domain of propositions, second to their willingness to deploy that knowledge within that domain, and third to their awareness of the primary and secondary issues pursuant to that domain of knowledge. Accordingly, he defines an expert as "someone who possesses an extensive fund of knowledge (true beliefs) and a set of skills or methods for apt and successful deployment of this knowledge to new questions in the domain." Similarly, he notes that "anyone purporting to be a[n]...expert in a given domain will claim to have such a fund and set of methods, and will claim to have true answers to the question(s) under dispute because he has applied his fund and his methods to the question(s)."<sup>54</sup> Fuller, meanwhile, argues that the designation "expert" serves principally to identify that one has achieved a given status within a social community. He contends that experts' disciplinary power follows less from their actual knowledge than from their ability to convince others that they possess knowledge. Looking at things from this view, the label expert functions primarily as a rhetorical category. Fuller identifies four ways by which he recognizes expertise as "a constitutively social phenomenon."<sup>55</sup> He notes not only that "the skills associated with an expertise are the product of specialized

---

<sup>54</sup> Alvin Goldman, "Experts: Which Ones Should You Trust?", in Evan Selinger and Robert P. Crease, *The Philosophy of Expertise*, (New York: Columbia University Press, 2006), 20.

<sup>55</sup> Steve Fuller, "The Constitutively Social Character of Expertise", in Selinger and Crease, *The Philosophy of Expertise*, 344.

training” but also that “both experts and the lay public recognize that expertise is relevant only on certain occasions.” Similarly, Fuller postulates that “the disposition of expertise is dependent on the collegial patterns of the relevant experts” and “the cognitive significance of an expertise is affected by the availability of expert training and judgment” as two further criteria of expertise.<sup>56</sup> Put simply, one does not embody so much as one performs expertise. Of particular import to this project, Fuller himself served as one of the expert witnesses arguing on behalf of the defense in *Kitzmiller v. Dover*, a role for which he attracted much criticism during the trial and in subsequent discussion of it. In separately defining the expert and his relationship to his field, Goldman and Fuller would seem to reiterate the old debate between Plato and the Sophists – that is, were the multiplicity of contemporary academic disciplines truly best served by discussing knowledge and expertise in such general terms as they do.

Indeed, seeking to define the expertise of particular disciplines further problematizes endeavors to postulate a general definition of expertise. One need not go in for all of Foucault to recognize that he had a point when he noted that “in order to be part of a discipline, a proposition has to be able to be inscribed on a certain type of theoretical horizon” a horizon which the practitioners within a field contest among themselves.”<sup>57</sup> Consequently, scholars in a number of fields have articulated specific defenses of their own fields’ disciplinarity and, consequently, their own capacity to be experts in those fields and speak publicly with authority. In philosophy, for example, scholars have disputed whether one can be an expert in philosophy in the same way one can be an expert in the natural sciences. Singer, for example, has argued for the expertise of moral philosophers, suggesting that their “general training as a philosopher should make him

---

<sup>56</sup> Ibid.

<sup>57</sup> Michel Foucault, “The Order of Discourse” in in Patricia Bizzel and Bruce Herzberg, *The Rhetorical Tradition*, 1442.

more than ordinarily competent in argument and the detection of invalid inferences.”<sup>58</sup>

Furthermore, Singer continues, the moral philosopher’s “specific experience in moral philosophy gives him an understanding of moral concepts and of the logic of moral arguments” and

“can...think full time about moral issues, while most other people have some occupation to pursue which interferes with such reflection.”<sup>59</sup> In work more directly related to this dissertation,

Solan has argued both for the discipline-specific expertise of linguists and for their particular ability to illuminate disputes about meaning in the courtroom by suggesting that they possess a unique capacity to “analyze and explain generalizations in the structure and use of language.”<sup>60</sup>

Scholars in numerous other fields have likewise attempted to define expertise pursuant not only to their own fields but also relative to their particular role in the courtroom. Social workers, for

instance, have had their expertise in human behavior questioned or rejected by courtrooms on account of the authority associated with a credential like an MD or a PhD.<sup>61</sup> Others note that,

however expertise in a particular field is conceptualized, not all fields are equally assessable by the layperson. Some fields might constitute “cognitive islands,” or “domains in which

successfully identifying and assessing expertise requires that one already has expertise in that domain.”<sup>62</sup> Consequently, such fields, by virtue of their inaccessibility to the layperson, might

not be considered fields in which one can have “real” expertise at all. Despite their differences in

---

<sup>58</sup> Peter Singer, “Moral Experts,” *Analysis* 32, no. 4, (1974): 117.

<sup>59</sup> *Ibid.*

<sup>60</sup> Peter Solan, “Can the Legal System Use Experts on Meaning?,” *Tennessee Law Review* 66, no. 4, (1999): 1169.

<sup>61</sup> Israela Meyerstein and James Todd, “On the Witness Stand: The Family Therapist and Expert Testimony,” *The American Journal of Family Therapy* 8, no. 4 (1980): 45.

<sup>62</sup> See C. Thi Nguyen, “Cognitive Islands and Runaway Echo Chambers: Problems for Epistemic Dependence on Experts,” *Synthese* 197, no. 7, (2020): 2804. This article offers a useful discussion of the differences in the appeal to expert opinion entailed by different fields. While some fields have *obvious* tests that a layperson can comprehend at will, others have *subtle* tests that require esoteric knowledge of the field. Those fields with obvious tests, then, typically carry more epistemic authority. Those with subtle tests, meanwhile, might be challenged as not even being “real” disciplines at all. Moral philosophy, literary criticism, and art appreciation are held up as examples of fields whose subtle tests of expertise might make them suspect, though, obviously, such views can track with political orientation, a pattern that Nguyen insightfully discusses.

disciplinary focus, all of these attempts to define a particular expertise move by sketching the specific domain of knowledge over which an individual has authority, placing most scholars much more in line with Goldman's than with Fuller's general definition of expertise. Though perhaps frustrating, it will not surprise us to note that in distinguishing the expert from the lay person and expertise in one field, the problem of epistemic justification returns again and again. For, indeed, the main difference *in practice* between the expert and the lay person, regardless of the field, lies in how the expert and lay person separately justify the conclusions that they reach with respect to conclusions informed by a specific field. The field-specific competencies attributed to training in particular disciplines merely compounds the general problems of justification.<sup>63</sup>

Regardless of how they define expertise or the scope of experts' authority, scholars working on this issue must all contend with the justificatory problems that lay-people encounter when trying to evaluate the claims which purported experts make. Laypeople seeking to evaluate the claims of experts must navigate around the very thing that the expert has but that they lack. According to the most widely views, what lay people simply lack the specialized knowledge experts possess' pursuant to a given domain of knowledge. Viewing the problem more like Fuller, one might contend that lay people simply lack the social sanctions associated with experts and the consequent confidence in judgement that follows. Regardless of how they identify the problem, philosophers do agree that one exists. Hardwig refers to this issue as the problem of "epistemic dependence." As he puts it, "appeals to the authority of experts often provide

---

<sup>63</sup> Consider, for example, the problem of evaluating the claims of competing experts. This problem is difficult for the person with no particular expertise, the generic layperson (if such persons actually exist), but it becomes even trickier when people *with* particular forms of expertise are brought into the equation. A biologist, for example, might not be as competent at judging the claims of competing chemists as a fellow chemist might be, but a biologist's general training in natural science will probably make him a more competent judge of the claims of competing chemists than, say, a literary critic.

justification for claims to know, as well as grounding rational belief.”<sup>64</sup> This justificatory function, however, creates even further problems. As he puts it, “the epistemic superiority of the expert to the layman implies rational authority over the layman, undermining the intellectual autonomy of the individual and forcing a reexamination of our notion of rationality.”<sup>65</sup> In other words, while the claims of experts provide *justification* for beliefs, laypeople by definition lack the domain-specific knowledge they would need to possess if the expert who has asked them to accept a claim really has the knowledge he or she claims to have. Consequently, subsequent debate has focused on whether and, if so, *how* individuals can evaluate experts’ claims to knowledge, especially when faced with competing opinions and situations, such as a court case, that require a decision outside the normal timetable of the peer review process. In other words, if you’re not an expert, how can you possibly know whether the person claiming expertise and its consequent authority over your decision making is an expert? Furthermore, if two so-called experts disagree, what procedures, if any, exist for the discriminating lay person who wants to responsibly distinguish between the claims of competing experts? Faced with this problem, one can easily imagine why so many Americans, who already find themselves constantly assaulted with claims to their time, attention, and money, might lose their resolve or focus. We can easily imagine why some simply wouldn’t care and adopt a Sophistic perspective – if not in theory, at least in practice. The amount of time it would take for a single individual hoping to adjudicate between the number of epistemically dependent claims he encounters in even one day makes the task unappealing to try at all, much less adopt as an intellectual virtue or practice.

Unsurprisingly, our acknowledged epistemic dependence seems to have attracted almost as many competing views as competing interlocutors. Some assert that laypeople can evaluate

---

<sup>64</sup> John Hardwig, “Epistemic Dependence”, 335.

<sup>65</sup> *Ibid*, 336.

the claims of competing experts, and that arguing the contrary denies the very concept of expertise, for even experts within a field have to rely on other experts within their field at some point. If the lay person lacks the ability to discriminate between the claims of experts, then so must the expert for, with respect to other fields and even other sub-fields within his field, he occupies the same position of the lay person with respect to him. Consequently, according to this view, the concept of expertise, understood as Goldman defines it, at least, entails affording the layperson this power. Thus, Goldman offers five ways by which laypeople can distinguish reliable from unreliable expert claims. By considering “the arguments presented by contending experts to support their own views and critique their rivals views, agreement from additional putative experts on one side or the other, appraisals by ‘meta-experts of the experts’ expertise, evidence of the experts’ interests and biases, [and] evidence of the experts’ past ‘track-records,’” lay people may successfully evaluate the reliability of an expert’s claims.<sup>66</sup> Hardwig even goes so far as to contend that “unless we maintain that most of our scientific scholarship could *never*, because of the cooperative methodology of the enterprise, result in knowledge,” then we must commit ourselves to the proposition that lay people can discriminate between the competing claims of experts.<sup>67</sup> In other words, the ability to speak of disciplines in a coherent way *at all* demands that we at least assert our ability to discern between the competing claims of experts in addition to the frequent necessity of doing so.

Confident as they are, Hardwig and Goldman seem not to acknowledge, or to prematurely think they have dispensed with, those scholars who wish precisely for what they Goldman and Hardwig decry as the consequence of opposing their view: to disrupt the conceptual integrity of such socially, politically, and intellectually dominant fields as the natural

---

<sup>66</sup> Goldman, “Experts: Which Ones Should You Trust?”, 21.

<sup>67</sup> Hardwig, “Epistemic Dependence,” 348-349.

sciences. These scholars contend that lay people can never be said to have knowledge based on the claims of an expert because all knowledge functions as a form of power and that accepting epistemic dependence in the sense that Hardwig and Goldman discuss involves assenting to that power. Feyerabend, rejecting the Popperian criterion of “falsification” as a line of demarcation between “scientific” and “non-scientific” views, argues that all claims to scientific expertise merely obscure the political function of scientists, who themselves legitimize the broader power of the state and capitalist values in the production, distribution, and regulation of knowledge.<sup>68</sup> According to this conception of expertise, the non-expert’s decision between competing experts becomes a problem not in discerning whose claim is the truest but whose ideology he or she most prefers. By this view, epistemic justification, like expertise itself, involves a relationship not so much between a disputable proposition and reality, but between a self-contained, tautological set of self-reinforcing propositions, none of which refers to anything in reality so much as to other propositions within that set. By implication, apparent technical disputes between experts and, especially, between experts and the lay public, are in reality stealth wars for cultural and institutional power. Insofar as one group gains too much of a monopoly on such power, then, society as a whole is disadvantaged. Alluding to the fundamentalist controversies that will form the focus of this dissertation’s later chapters, Feyerabend jokes, “Three cheers to the fundamentalists in California who succeeded in having a dogmatic formulation of the theory of evolution removed from the textbooks and an account of Genesis included (But I know that they would become as chauvinistic and totalitarian as scientists are today when given the chance to run society all by themselves.”<sup>69</sup> In Feyerabend’s final analysis, *any* form of intellectual

---

<sup>68</sup> Paul Feyerabend, “How to Defend Society Against Science,” in Sellinger and Crease, *The Philosophy of Expertise*.

<sup>69</sup> *Ibid*, 365.

monopoly, even a regime of “truth,” is ultimately bad for society because it requires the layperson to defer too much to the expert, deference for which he ultimately not only does not but *could* not acquire rational justification.

Considering the relationship between expertise and epistemic justification speaks to the relationship between knowledge and power because of the particular role that an expert’s recommendation plays in the epistemic justification of non-experts. Indeed, the function of expertise to both imbue and to reflect one’s location within a particular discourse community forms the main line against which philosophers struggle to define expertise. Turner suggests that “if experts are the source of the public’s knowledge, and this knowledge is not essentially superior to unaided public opinion, not genuinely expert, the ‘public’ itself is presently merely less competent than the experts but is more or less under the cultural or intellectual control of the experts.”<sup>70</sup> Members of the “non-expert” public have both the right and, in some cases, the obligation, then, to refuse deference to expert rule.

So much, then, for the concept of expertise. As a speech act, testimony surrounds us to such a degree that we base fundamental knowledge of our identities on it. We recognize, for instance, photos of ourselves as infants on the basis of our parents’ testimony. As a source of knowledge, testimony highlights and sharpens the epistemic challenges associated with justification. Even though everyone has told at least one lie, for instance, we feel insulted when someone lies to us, and the fear of believing a lie functions as a primary motivator for us to scrutinize the testimony of others. As a form of legal evidence, testimony offers some of the simultaneously most contestable and evincible evidence available. While lawyers frequently challenge and discount the eyewitness testimony of laypeople, for instance, the testimony of

---

<sup>70</sup> Stephen Turner, “What’s the Matter with Experts,” in Sellinger and Crease, *The Philosophy of Expertise*, 125.

experts has the power to convict even in the absence of other evidence. What can account for such schizophrenic attitudes and behaviors with respect to testimony? How does the English language offer unique resources for modifying testimony so as to surpass these epistemic, linguistic, and rhetorical barriers?

### **The Philosophical Problems of Testimony**

While experts have many means through which they can report claims to their colleagues and to non-experts, testimony remains both one of the most common means through which experts engage with each other and non-experts and also one of the most discussed philosophical problems associated with the concept of expertise. The challenges associated with defining and distinguishing testimony as a speech act and explaining its role in epistemic justification have, like the problems associated with expertise, concerned philosophers since at least the days of Plato. In general, testimony is broadly construed as a form of speech act. Contemporary philosophers differ, however, in *whether* and *how* testimony can act as a source of knowledge with respect to epistemic justification. Positions on testimony are broadly divided into *reductionist* and *anti-reductionist* views. Reductionists, who can be further divided into *global* or *local* reductionists, share the view that testimony does not constitute a basic source of knowledge and, consequently, must be reduced to some other, more basic source of knowledge, such as perception or memory. While global reductionists argue that all testimony is reducible to more basic sources of knowledge, local reductionists contend that only some testimony is thus reducible. Anti-reductionists, meanwhile, argue in various ways that testimony *can* function as a basic source of knowledge, on par with memory, perception, and the like. Surveying the literature of both positions on testimony, however, takes one to the Enlightenment-era disputes between David Hume and his principal rival, Thomas Reid.

Philosophers seeking to offer robust definitions of testimony have begun by distinguishing testimony from other forms of speech acts. Second, they differentiated testimony from other sources of knowledge. Speech act theory not only helps us to distinguish testimony from other kinds of utterances but also provides the primary theoretical link between the legal, linguistic, rhetorical, and philosophical problems entailed by expert witness testimony. Since testimony itself acts as *the* primary concept linking these fields for my purposes, these definitions and distinctions demand no small amount of attention. J.L. Austin, the legal philosopher most typically associated with speech act theory, contends that “many utterances which look like statements are either not intended at all, or only intended in part, to record or impart straightforward information about the facts” in order to distinguish between the content of a statement and the performance of that statement.<sup>71</sup> Furthermore, he elaborates upon the “illocutionary force” of a statement by considering the paradigmatic example of speech-act theory: the promise.<sup>72</sup> When someone says “I promise to do x,” the act of having made the statement, not the particular words of the statement, creates the social obligation to follow through on what one has promised to do – and the social consequences for failing to do so. While Austin does not explicitly theorize testimony as a speech act, Searle notes that testimony serves two primary functions that constitute the “illocutionary force” of a particular act of testimony, the distinction between what the words of an utterance *are* saying and what the words of an utterance *are* doing. First, testimony asserts a proposition or set of propositions and second, testimony asserts the speaker’s belief in the propositional content of the sentence through which he or she has conveyed these propositions.<sup>73</sup> In other words, the speaker not only that something

---

<sup>71</sup> Austin, 1.

<sup>72</sup> Ibid, 101.

<sup>73</sup> Searle, 54-72.

is the case, but that he or she also *believes this to be the case*. Following the discussion of Plato and the Sophists from earlier in this chapter, this distinction should seem quite clear. Searle's second function of testimony points to the significance of testimony in our daily lives and highlights the value of investigating the epistemic problems associated with evaluating it both in general and when it comes from experts. Whether we routinely look to experts or not, we all communicate information to others and typically assume that when other people speak to us, they at least *believe* that what they are saying is true, regardless of whether or not they have presented good reasons or, for that matter, any reasons. Take away this assumption, and we end up in a pragmatic *reduction ad absurdum*, incapable of acting because we are incapable of trusting. Since nobody would live this way – sheer boredom would eventually drive even the most suspicious misanthrope to trust another person out of curiosity alone – investigations of testimony tend to assume that simply not trusting people does not constitute a reasonable option, nor does it constitute an especially interesting problem.

Some have contended that testimony presents so many problems that it cannot justify belief on its own because it cannot function as a basic source of evidence. Recalling Socrates's reference to the Athenian jurist in *Theatetus*, Plato himself asked whether testimony can ever serve as appropriate justification such that we can attribute the acquisition of knowledge to having heard some piece of testimony or another. According to proponents of the reductionist view articulated by Hume, testimony cannot serve as a basic source of evidence because it does not amount to direct experience of events. Whether or not one is justified in believing testimony, then, depends on whether the person conveying testimony has good reasons to believe the content of their testimony. In order to determine that, though, *other* reasons for believing that person's testimony must be supplied. As Hume puts it, "no objects have any discoverable

connexion together...and all the inferences, which we can draw from one to another, are founded merely on our experience of their constant and regular conjunction; it is evident, that we ought not to make an exception in favor of human testimony, whose connexion with an event seems, in itself, as little necessary as any other.”<sup>74</sup> In other words, people are entitled to believe testimony for the same reason they are entitled to believe anything else—because they have seen, through repeated experience, that it can at least *sometimes* be relied upon. Significantly, this view puts the burden of proof *one the testifier* and *on the contents of the testimony* (this, too, is one of the ways in which the reductionist view differs in application from the anti-reductionist view). Hume’s reductionism enables him to explain the difference between reliable and unreliable testimony. When the content of testimony is reliable, it is analogous in justificatory force to direct perception or memory.

This view has important implications for how Hume weighs different sources of evidence. Compared to more basic sources of evidence, testimony offers inherently less reliability and, thus, is afforded less evidential weight than direct experience. When testimony contradicts what has been directly experienced again and again, then, one is justified in rejecting the contents of that testimony.<sup>75</sup> From these premises, Hume rejects the testimonial evidence of religious assertions such as miracles. For more contemporary reductionists, this view enables one to reject, for example, the testimonial evidence of divine revelation.

Twentieth and twenty-first century philosophers disagree about testimony primarily in the degree to which they regard it as a fundamental source of epistemic justification, not whether it *can* serve as a source of justification. According to the *reductionist* view advocated by thinkers such as Elizabeth Fricker, testimony functions as an epistemic warrant because *true* testimony

---

<sup>74</sup> David Hume, *An Enquiry Concerning Human Understanding*, (Indianapolis: Hackett, 1993), 74.

<sup>75</sup> *Ibid*, 75; 77.

functions analogously to direct perception with one's own eyes or other senses.<sup>76</sup> Fricker, rejecting the antireductionist presumption that people have the right to believe testimony unless they have reasons to reject it, contends that testimony cannot function as a basic source of evidence. She makes her case by arguing against the "Negative Claim" of the antireductionist position, which asserts that confirmation of a given testifier's trustworthiness through non-testimonial evidence, one of the key tenets of Hume's reductionism, is generally not possible, and so people must have a *presumptive right* to believe the testimony they encounter.<sup>77</sup> This, Fricker suggests, is tantamount to endorsing gullibility because, in fact, in many particular cases of testimony, a person *can* verify the contents of testimony independently. Consequently, Fricker argues, it need not be shown that instances of testimony can in all cases or in general be independently verified in order for her to be justified in rejecting the Negative Claim and articulating what she calls *local reductionism*.<sup>78</sup> In this argument, Fricker would seem to sidestep one of the major objections to Hume's theory first made by Thomas Reid, not only a major proponent of the antireductionist position but also, along with Francis Bacon, one of the major philosophical influences on the Antievolution, Creation Science, and Intelligent Design theorists with which I will be concerned later.

Proponents of the *anti-reductionist* position contend that testimony can function as an independent source of epistemic justification because testimony can, in some if not all conditions, function as a basic source of evidence. This view originated in the "common sense" philosophy of Hume's most prominent rival Thomas Reid. Reid argues that "artificial language,"

---

<sup>76</sup> Elizabeth Fricker, "Against Credulity", in Bimal Matilal and Arindam Chakrabarti, *Knowing From Words: Western and Indian Philosophical Analysis of Understanding and Testimony*, (Boston: Kluwer Academic Publishers, 1994): 125-160.

<sup>77</sup> *Ibid*, 127-128.

<sup>78</sup> *Ibid*, 157-158.

his term for human languages, functions analogously to the “natural language” of gesture, pitch, intonation, and the like. “Nature,” he contends, “hath established a real connection between these signs, and the thoughts and dispositions of the mind which are signified by them; and nature hath taught us the interpretation of these signs; so that, previous to experience, the sign suggests the thing signified, and creates the belief of it.”<sup>79</sup> In other words, humans possess an *innate* capacity to understand each other through these physical signs. Written and spoken language act the same way, so that there is a word for a thing *is not* independent of the thing that it signifies.

Indeed, considering the problems inherent in acquiring a language leads Reid naturally to the problems of testimony. A child learning a language, for example, might be able to imitate the sounds she has heard others make but without knowing the meanings of the words. How does a child, then, learn to assign a particular meaning to a particular word? “There is,” he goes on, “in the human mind an early anticipation, neither derived from experience, nor from reason, nor from any compact or promise, that our fellow-creatures will use the same signs in language, when they have the same sentiments.”<sup>80</sup> For Reid, this is because “The wise and beneficent Author of Nature, who intended that we should be social creatures, and that we should receive the greatest and most important part of our knowledge by the information of others, hath, for these purposes, implanted in our natures two principles that tally with each other.”<sup>81</sup> Reid calls the first of these two principles, a natural human “propensity to speak truth,” the *principle of veracity*. Reid uses the principle of veracity along with a human “disposition to confide in the veracity of others,” which he calls *the principle of credulity*, to explain why testimony ultimately offers a rational warrant for belief. Because people have a natural tendency to tell the truth and to

---

<sup>79</sup> Thomas Reid, *Inquiry into the Human Mind*, (Edinburgh: Edinburgh University Press, 1997), 190.

<sup>80</sup> *Ibid.*, 193.

<sup>81</sup> *Ibid.*

believe others, it is contrary to human nature to disbelieve testimony on principle. In the final estimate, Reid believes that testimony must be accepted as a basic source of knowledge because, without it, we wouldn't be able to form *any* beliefs at all.

More contemporary antireductionists, focusing on establishing that testimony has to be accepted as a basic source of knowledge and on problems with the reductionist account of perception, have continued along these lines. Beliefs about past events that an individual did not take part in, for example, cannot be plausibly said to be reducible to either memory or perception.<sup>82</sup> More importantly, the assumption that perception is a fundamentally more basic form of knowledge than testimony is has some more basic flaws. As Coady points out, “when I believe unhesitatingly that there is a tomato on the table in front of me on the basis of visually perceiving it, I would normally be conceded the right to know this directly.”<sup>83</sup> Nevertheless, Coady goes on, “its knowledge status rests upon the truth of such propositions as that the lighting is normal, that no one has recently entered the room and placed a plastic copy of a tomato on the table...My knowledge rests on the truth of these and many other propositions but it is normally no requirement of my knowing that I have established their truth.”<sup>84</sup> In ordinary life and discourse, people typically take their senses to be reliable unless their knowledge of some impediment, such as a hallucination or being drunk, for example, gives them reason to doubt the veracity of their senses. Extending that same consideration to testimony, then, Coady contends that “we do not have to establish the many propositions which, if false, would invalidate our ready assent to what we are told, unless there is already some reason to believe that their truth is in jeopardy.”<sup>85</sup> This view of testimony, then, helps in a further way to explain all the

---

<sup>82</sup> C.A.J. Coady, *Testimony: A Philosophical Study*, (New York: Oxford University Press, 1992), 142.

<sup>83</sup> *Ibid*, 144.

<sup>84</sup> *Ibid*.

<sup>85</sup> *Ibid*, 145.

philosophical wrangling over expert testimony: if the condition of epistemic dependence discussed earlier does not count as such an impediment to “ready assent,” then it is hard to imagine what would. For the lay person evaluating expert testimony, both Fricker and Coady raise important concerns, for just as no one wants to gullibly believe a quack, so too no one wants to waste time skeptically trying to verify the testimony of an expert whose word could have been reasonably believed without further investigation.

More recent work has shifted the focus away from the beliefs of the testifier relative to his or her testimony and toward the words of testimony themselves. Lackey (2006) goes a step further than Coady by contending that words themselves, not the beliefs of the testifier relative to the words, justify testimony. As she argues, “a speaker offers a statement to a hearer, along with the epistemic properties *it* possess, and a hearer forms the corresponding belief on the basis of understand and accepting the statement in question. Statements are not, therefore, merely vehicles for expressing beliefs but, rather, they are the central bearers of epistemic significance themselves.”<sup>86</sup> Despite positing testimony as a primary source of knowledge, Lackey’s view departs from Coady’s in a significant way. According to Coady’s view of testimony, a speaker must believe his or her statement. Lackey renders the testifier’s belief relative to the statement so irrelevant that he or she could *believe* that he or she is lying yet still, by virtue of believing the wrong things about his or her own statement, communicate knowledge. The precise distinction between an individual’s motive for testifying and the ability of his or her statements to serve a justificatory role in the beliefs of others, however, most justifies studying the convergence of philosophical problems of expertise and testimony when we consider how expert witness testimony provokes these problems in American courtrooms.

---

<sup>86</sup> Jennifer Lackey, *Learning From Words: Testimony as a Source of Knowledge*, (New York: Oxford University Press, 2008), 93.

### A Brief History of Expert Witness Testimony in the United States

Legally speaking, expert witnesses and lay witnesses differ in that while expert witnesses can express an opinion, a lay witness cannot. This makes expert witness testimony, despite the philosophical problems associated with the concept of expertise or the act of testifying, a powerful, often decisive, component of a set of legal arguments.<sup>87</sup> Something like expert witnesses have been testifying in the courts of English-speaking peoples for a very long time. Learned Hand suggests that the practice of hearing what would now be called expert witness testimony can be traced to two practices dating from “times before trial by jury was much developed.”<sup>88</sup> In observing the first of these practices, persons “as were by experience especially fitted to know the class of facts which were before them” were selected to act as jurymen.<sup>89</sup> In cases, for example, in which a person had been sold “putrid meat” or “bad wine,” a mayor would “summon persons of the trade of the man accused, as being well acquainted with the facts, and their verdict would decide and the mayor direct the sentence accordingly.”<sup>90</sup> The second practice, which Learned Hand dates to as early as 1345, involved a court summoning “the advice of certain skilled persons to help it out of its difficulties.”<sup>91</sup> Thereafter, he notes a number of cases wherein a court would summon grammarians, merchants, doctors, and others possessing specialized knowledge; significantly, however, such courts were not bound by the advice of the testifying experts.

Legal scholars disagree, however, about precisely *when* the first “modern” expert witnesses first began testifying in in Anglo-American courts because they disagree about how to

---

<sup>87</sup> Roger Park, David Leonard, Aviva Orenstein, and Steven Goldberg, *Evidence Law: A Student’s Guide to the Law of Evidence as Applied in American Trials*, (St. Paul: West Academic Publishing, 2011), 530.

<sup>88</sup> Learned Hand, “Historical and Practical Considerations Regarding Expert Testimony,” *Harvard Law Review* 15, no. 1, (May, 1901): 40.

<sup>89</sup> *Ibid.*

<sup>90</sup> *Ibid.*, 41-42.

<sup>91</sup> *Ibid.*, 42.

define the difference between an expert witness and an ordinary witness, a distinction surely as important if not exactly analogous to the more general distinction between the expert and the lay person.<sup>92</sup> For Learned Hand, the essential characteristic here is that an expert witness is not bound by the rule forbidding witnesses from expressing an opinion. Consequently, he dates the first appearance of the modern expert witness to the 1619 English case of *Alsop v. Bowtrell*, in which physicians testified about how long after the death of a husband a pregnant woman might be said to be carrying a legitimate child.<sup>93</sup> Offering a later date, James Thayer and Stephan Landsman date the first appearance of the modern expert witness to the 1782 case of *Folkes v. Chadd*, in which engineers testified about the causes of a well's decay.<sup>94</sup> For Landsman, the important distinction is that expert witnesses, *like other witnesses*, are called by parties and that those same witnesses face cross examination.<sup>95</sup>

However the distinction between expert and lay witnesses is defined and however the first appearance of expert witnesses is dated, discussion of expert witnesses in legal textbooks began, historically speaking, only relatively recently – in 1795 with the fourth edition of Lord Gilbert's *Laws of Evidence*. Throughout the 19<sup>th</sup> century, the appearances of expert witnesses, who piggybacked on the general authority afforded to the natural sciences and their practitioners, grew immensely. Rather than enhance the authority of expert witness testimony as a *species of evidence*, though, the voluminous amounts of expert witnesses, for whom legal mechanisms of “quality control” had not yet been adequately developed, actually diminished the authority of expert witness testimony because so many dubious, disreputable, or outright fraudulent witnesses

---

<sup>92</sup> I say that the philosophical and legal categories are not exactly analogous because while the philosophical distinction between the expert and the lay person is largely conceptual and nebulous, the legal distinction is more empirical and, if not perfectly delimited, at least not quite so ambiguous as the philosophical one.

<sup>93</sup> *Ibid*, 45.

<sup>94</sup> James Thayer, *Select Case on Evidence at the Common Law*, (Cambridge: Charles W. Sever, 1892), 666.

<sup>95</sup> Stephen Landsman, “Of Witches, Madmen, and Product Liability: An Historical Survey of the Use of Expert Testimony,” *Behavioral Science and Law*, 13, no. 2 (1995): 141.

were allowed to testify. As Golan puts it, “while the volume of expert testimony was constantly increasing throughout the nineteenth century, the respect paid to it by the courts was constantly diminishing.”<sup>96</sup> At an 1866 meeting of the American Society of Arts and Sciences, for instance, Judge Emory Washburn, also a teacher of law at Harvard, denounced expert witness testimony, suggested that it advanced the self-interest of litigants more than the impartial dispensation of justice.<sup>97</sup> This problem was compounded by the prohibitions present in most states on judge’s giving specific instructions on expert witness testimony to juries, who were more often than not left to themselves to determine the veracity of a given expert’s testimony. Although attempts to stem the tide of unreliable expert testimony by controlling the laws of evidence were made, “late-nineteenth-century America saw the problem of scientific expert testimony reaching a crisis.”<sup>98</sup> It was not until the 1920s that this crisis was addressed in something approach a way that was adequate to the legal community.

A viable standard seemed to emerge in 1923 with the ruling by the Court of Appeal of the District of Columbia in *Frye v. United States*. This case concerned the murder conviction of James Frye, a young African American man who had confessed to the murder of a prominent Washington DC physician before retracting his confession and offering an alibi for his whereabouts during the murder shortly before his trial. Unable to find a witness to support Frye’s alibi or to get Frye’s confession excluded from evidence, Richard Mattingly, Frye’s attorney, sought to introduce the results of the “deception test” newly developed by a physician, William Marston. Marston’s test monitored changes in systolic blood pressure such that changes in blood

---

<sup>96</sup> Golan, *Laws of Men and Laws of Nature*, 54.

<sup>97</sup> *Ibid*, 135-136.

<sup>98</sup> *Ibid*, 143. Golan offers, in 140-143, a detailed discussion of the attempts made to deal with the problems created by expert witness, which included prohibiting experts from testifying on the “ultimate issue” of fact before the jury and the “hypothetical question doctrine,” by which an expert might testify on whether some general, analogous cause *may* have caused some particular effect but was prohibited from testifying as to a case’s particulars.

pressure could be correlated with attempts at deception. According to Marston's test, Frye's original confession had been a lie, but his alibi was completely true.<sup>99</sup> The trial judge, however, insisted that the probabilistic nature of Marston's results rendered them inadmissible. Indeed, the judge went so far as to contend that until such tests could offer "infallible" evidence of deception, they would remain inadmissible. Frye, consequently, was convicted of second-degree murder.

The judge's insistence on "infallibility" formed the foundation of Frye's appeal. Since Marston's deception test enjoyed probabilities of success similar to the results of ballistics, handwriting, and other experts commonly admitted to the courts, infallibility could not function as a reasonable evidentiary standard.<sup>100</sup> If it wanted to exclude Marston's deception test, the Court of Appeal of the District of Columbia would have to articulate a better reason than that given by the trial judge. Responding to this demand, the DC Court of Appeal articulated what has to be known, alternatively, as the General Acceptance Standard or the *Frye Rule*:

Just when a scientific principle or discovery crosses the line between the experimental and the demonstrable stages is difficult to define. Somewhere in this twilight zone the evidential force of the principle must be recognized, and while courts will go a long way in admitting expert testimony deduced from a well recognized scientific principle or discovery, the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field to which it belongs.<sup>101</sup>

On these grounds, Marston's deception test was rejected, and Frye's conviction was upheld. Throughout much of the 20<sup>th</sup> century, the Frye Rule offered an imperfect but generally workable solution to many of the problems that had been identified at the turn of the century.

---

<sup>99</sup> Ibid, 246. Golan offers a detailed discussion of Frye's trial and the role that the exclusion of Marston's test played in Frye's conviction and the subsequent development of the "Frye Test."

<sup>100</sup> Ibid, 248.

<sup>101</sup> *Frye v. United States*, 293 F. 1013 D.C. Cir. (1923).

Indeed, “by the early 1950s, *Frye* was already proclaimed in the legal literature as the main criterion for the admissibility of novel types of scientific evidence.”<sup>102</sup> Being widely adopted by both Federal and State courts, the Frye Rule, by the 1970s, seemed to put to rest main of the past century’s disputes.

Then, in 1975, the codification of the *Federal Rules of Evidence* (FRE), which completely ignore the Frye Standard and gave judges wide discretion over what kind of expert witness testimony to allow, reignited the controversy over expert witnesses in American courts.<sup>103</sup> For nearly two more decades, the evidentiary role of expert witness testimony was in flux yet again. In a trio of cases throughout the 1990’s, the Supreme Court settled the question in the affirmative: the FRE *did* supersede the Frye Rule. Furthermore, Federal judges were given the discretion to determine whether or not to classify a given expert’s testimony as scientific. In the cornerstone of the trio, 1993’s *Daubert v. Merrell Dow Pharmaceuticals*, the Supreme Court established that the 1975 adoption of the Federal Rules of Evidence, which afford judges individual discretion with respect to scientific expert witness testimony, superseded the Frye Rule. In addition to affording Federal judges the power to determine the relevance of a given piece of evidence to a case, the *Daubert* opinion also held that the term “science,” for purposes of evidence, refers specifically to what we call the “scientific method,” which includes such standards as falsifiability and peer review.<sup>104</sup> Going beyond *Daubert*, the Court’s 1997 ruling in *Joiner* afforded District Court judges the power to determine whether the studies upon which experts base their testimony support the conclusions that they draw. Two years later, the Court generalized the power of judges relative to expert testimony by concluding in *Carmichael* that

---

<sup>102</sup> Golan, *Laws of Man and Laws of Nature*, 260.

<sup>103</sup> Park, 536 - 537.

<sup>104</sup> *Daubert v. Merrell Dow Pharmaceuticals*.

the judge's "gatekeeping" function applied not only to the testimony of scientists, but to all testimony based on specialized or technical knowledge. Today, these principles are expressed in FRE 702 and 703 which, in their most recent forms, require that "the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence" and that experts rely "on sufficient facts or data...[and] the product of reliable principles and methods." Interestingly enough, while American society in general was affording more power to experts, the Supreme Court was taking power away from them.

Far from settling the problems associated with expert witness testimony, however, the Court's ruling in *Daubert*, through which Justice Blackmun imported the theory of scientific demarcation developed by Karl Popper, whose philosophy of science was one of the most influential of the 20<sup>th</sup> century. In particular, Justice Blackmun took up Popper's views on what philosophers call "the problem of demarcation," or the act of distinguishing scientific from non-scientific propositions.<sup>105</sup> According to Popper's view, which, although prominent, did not go unchallenged throughout the 20<sup>th</sup> century,<sup>106</sup> scientific propositions are distinguished from non-scientific propositions by their capacity to be "falsified."<sup>107</sup> Beginning by noting Hume's old problem of the impossibility of ever proving a statement *inductively*, Popper contends that "the logical form of a conclusion "must be such that it can be singled out, by means of empirical tests, in a negative sense."<sup>108</sup> In other words, while statements cannot be proven *true*, they *can* be shown to be *false*. By postulating the falsifiability criterion, Popper hopes to solve the demarcation problem and provide a clear means for distinguishing scientific fields from non-

---

<sup>105</sup> Significantly, the problem of demarcation features, to varying degrees of significance, in *Scopes*, *McLean*, and *Kitzmiller*.

<sup>106</sup> Specifically, the works of Thomas Kuhn, Paul Feyerabend, and Imre Lakatos offer different views on the problem of demarcation, the field-specific debates over which it would be impractical to spend much time on here.

<sup>107</sup> Karl Popper, *The Logic of Scientific Discovery*, (London: Routledge Classics, 2002).

<sup>108</sup> *Ibid*, 18.

scientific fields, an especially important *practical* issue when the prestige and authority of science are taken into account.

As anyone familiar with the history of expert witness testimony might have predicted, the Daubert Rule has not settled disputes about expert witness testimony among either jurists or philosophers. Scott Brewer, for example, has argued that all the Daubert Standard is rework the way that the problems of epistemic dependence appear in the court room. Given the gatekeeping role imposed on judges by Daubert, how is a judge, who may be an expert in the law but who lacks any number of specific scientific competencies, to determine *which* scientific expert's testimony to admit into evidence? Neither relying a judge's "epistemically substantive judgment" about the expert's testimony nor "general canons of rational evidentiary support" may, Brewer argues, rationally justify deference to expert witness testimony. In the first case, "many judges would be led to convert what is on the surface a substantive inquiry by nonexpert judges...into a form of deference based on demeanor and credentials," which Brewer also rejects as warrants for non-expert epistemic deference.<sup>109</sup> Resorting to general canons of rational evidentiary support, meanwhile, fails because "failures of rational coherence in an expert's testimony will most often be closer to the *obscure* end of the spectrum than to the nonobscure end," requiring for coherent understanding of claims knowledge of the discipline that, by definition, the nonexpert lacks.<sup>110</sup>

Other critics of the Daubert Standard have argued that it incoherently synthesizes Popper's falsifiability criterion, which is itself inherently flawed, with incompatible concepts from other philosophers of science. Susan Haack, for instance, contends that the Daubert Standard fundamentally misinterprets the falsifiability criterion, which she rejects anyway.

---

<sup>109</sup> Ibid, 136.

<sup>110</sup> Ibid, 138.

Tracing through the legal literature how the Court came to render the falsifiability criterion as “a claim that has been tested but not falsified is thereby confirmed, i.e. shown to be probably, valid, warranted, or reliable,” Haack observes that this version of falsifiability is, however, one that “he [Popper] repeatedly and emphatically denied.”<sup>111</sup> Furthermore, notes that the Daubert decision seems to merge Popper’s falsifiability criterion with the confirmationist position of Carl Gustav Hempel, who argued that inductive confirmation, not falsification, provided the line of demarcation between scientific and non-scientific statements. By doing this, the court confuses the assessment of whether a given expert’s testimony should be classified as scientific with whether it is actually reliable, not-so-implicitly suggesting that the former implies the latter.<sup>112</sup> Noting that Popper himself explicitly identified Hempel’s position as incompatible with his own, Haack observes that, “though Hempel’s philosophy of science *is* more positive than Popper’s, it isn’t much more help with the question of reliability” because “the confirmation of generalizations by positive inference that preoccupies Hempel is far too simplified to apply to the complex congeries of epidemiological, toxicological, etc., evidence” and “what Hempel offered was an account of supportiveness of evidence.”<sup>113</sup> So, even if the falsifiability criterion were *itself* an appropriate place to draw the line of demarcation, the Court’s synthesis of it with an incompatible idea renders it incoherent in application.

Ultimately, though, the falsifiability criterion itself, Haack argues, fails to provide an actual solution to the demarcation problem while simultaneously offering little in the way of a

---

<sup>111</sup> Susan Haack, “Federal Philosophy of Science: A Deconstruction—and a Reconstruction,” in *Evidence Matters: Science, Proof, and Truth in the Law*, (New York: Cambridge University Press, 2014), 134. Haack ultimately traces Justice Blackmun’s representation of Popper’s ideas to a law review article cited by Blackmun in the Daubert decision, an article that she criticizes pretty intensely, even going so far as to suggest that its author might not even have read Popper. See 138-140 of the same for Haack’s discussion of this problem. If she is right, then it would seem that the Federal philosophy of science rests, essentially, on some pretty sloppy work.

<sup>112</sup> Susan Haack, “Trial and Error: Two Confusions in *Daubert*” in *Evidence Matters*, 106.

<sup>113</sup> *Ibid*, 110-111.

useful test of an expert witness's reliability. Because Popper views induction as "wholly unjustifiable, there can be no reason to believe that a theory that passed a certain test today would pass the same test tomorrow."<sup>114</sup> Furthermore, she continues, "the acceptance of basic statements is not justified by scientists' observations, but is purely a matter of decision on the part of the scientific community."<sup>115</sup> In other words, the axioms or starting points of inquiry cannot be inductively ascertained. The falsifiability criterion fails, then, because "if Popper's account were true, there would be no way to recognize reliable scientific testimony."<sup>116</sup> In the end, Haack wants the Federal court system to stop wrangling with the problem of demarcating scientific from non-scientific testimony, which she does not think it is really equipped to do, and to focus instead on establishing practical standards of scientific reliability.<sup>117</sup>

It could be argued, however, that critiques such as those of Brewer and Haack aspire for the legal system to operate in more ideal, Platonic terms than it is actually capable of operating. Danielle Achaya takes this position, arguing that Haack simply assumes "that science is a more legitimate inquiry into truth compared to law, and underemphasizes the legitimacy of legal inquiry."<sup>118</sup> While "science seeks to arrive at some empirical truth,"<sup>119</sup> the law achieves its legitimacy by means of its "consistent adherence to legal procedure."<sup>120</sup> While the law may not arrive at "truth" conceived according to the strict standards of empirical science, it still operates more or less consistently with respect to established "legal facts." Haack, Achaya argues,

---

<sup>114</sup> Haack, "Federal Philosophy of Science," 129.

<sup>115</sup> *Ibid.*

<sup>116</sup> *Ibid.*, 124.

<sup>117</sup> Haack offers a thorough set of suggestions for reformation of the way in which the legal system deals with the logical distinctions between the scientific and non-scientific fields. In the interest of staying "in my lane," though, I will simply direct the reader to pp 149 - 154 of Haack's essay and leave it at that.

<sup>118</sup> Nayha Acharya, "Law's Treatment of Science: From Idealization to Understanding," *Dalhousie Law Journal* 36, no. 1, (2013): 15.

<sup>119</sup> *Ibid.*

<sup>120</sup> *Ibid.*, 20.

“compares science and law without mentioning that the internal legitimacy of the legal process is premised on the law’s internal definition of legal facts and proof,” an essentially coherentist position.<sup>121</sup> The law, according to this view, has “idealized” science in its own effort to borrow the legitimacy of science and simultaneously ignored an important distinction between their respective domains and methods of inquiry. While “science seeks to understand empirical realities” even as it “cannot prove truths with absolute certainty,” the law “seeks to establish legal facts, which are defined in the substantive law.”<sup>122</sup> While Haack would probably respond by noting that Achaya’s critique entails the same problem of starting axioms entailed by Popper’s falsifiability criterion, it is worth noting that this debate looks, in its form if not its content, an awful lot like a rehashing of the old debate between Plato and the Sophists.

### **Epistemic Dependence, Disciplinary Conflict, and Bad Science in the Courtroom**

While each judge possesses legal expertise and each juror may possess their own disciplinary expertise, no single individual can possess expertise in all fields. Consequently, every judge and every juror stands, at least in some respect, in a position of epistemic dependence with respect to the expert witness. Three distinct problems follow from the position of epistemic dependence in which judges and juries find themselves. First, jurors lack familiarity with the legal process and sometimes lack the knowledge to accurately distinguish between reliable and unreliable expert witness testimony. Second, the particular legal expertise of judges, combined with the ultimate political and social authority that the law holds over science in the courtroom, creates a clash between competing domains of expertise. Finally, the discrepancy between the legal system’s attempt to combat the influence of “junk science” and its often less-than-successful results draws attention to the rhetorical nature of evidentiary rules. Taken

---

<sup>121</sup> Ibid.

<sup>122</sup> Ibid, 37.

together, these specific problems with expert witness testimony enable the very abuse of it that I will discuss before considering how rhetoricians and linguists have grappled with the problems of expert witness testimony. In many ways, this problem returns us to the old debate between Plato and the Sophists, to the dichotomy between *being true* and *seeming true*.

Research into the anthropology of the courtroom has revealed how this problem plays out on the juror's end. Since the government randomly selects jurors from among citizens eligible for jury duty, the position of jurors relative to experts in the courtroom resembles but also complicates the position of the hypothetical layperson which philosophers have posited in their thought experiments. Jurors, after all, occupy their own professions, and many may themselves possess expertise in one or more scientific or other disciplines. Conley and O'Barr note that whereas lawyers and judges necessarily make their determinations according to the logic of the law, jurors, especially jurors who lack higher education, may operate within totally different paradigms, often evaluating not only the actors within the legal system but also the decisions it asks them to make according to more interpersonal standards of trust. In particular, such potential and actual jurors have displayed particular sensitive to how they perceive themselves being treated.<sup>123</sup> More recent writers such as Krauss and Sales suggest that mock juries evaluate the expert witness testimony of psychologists, for example, by evaluating the degree to which an attorney presents them with opposition to their testimony rather than the content of that opposition. When an attorney makes any challenge at all to the scientific veracity of a witness's claim, regardless of validity of that challenge, mock jurors will rate a given expert's testimony as less reliable.<sup>124</sup> The problems that jurors encounter with expert testimony take on an added

---

<sup>123</sup> John Conley and William O'Barr, *Just Words: Law, Language, and Power*, (Chicago: University of Chicago Press, 1998).

<sup>124</sup> Daniel Krauss and Bruce Sales, "The Effects of Clinical and Scientific Expert Testimony in Juror Decision Making in Capital Sentencing," *Psychology, Public Policy, and Law* 7, no. 2, (2001): 304.

weight when juxtaposed with the specific interdisciplinary clash created by the authority which judges have to admit or not admit expert witness testimony according to their own discretion. While scientists evaluate arguments according to the disciplinary standards of their fields, standards change across fields, and the more vaguely defined preponderance of evidence and beyond a reasonable doubt standard, to name just few, that exist in the American legal system, may not lead lawyers to elicit evidence from expert witnesses in ways consonant with the standards of a given witnesses' field. As a result, an ordinarily competent scientist or other expert can be made to seem frustrated, inept, or otherwise flawed in a rhetorical situation, such as the courtroom, that operates according to different rules.

This disparity speaks to the power that the law itself has as arbiter of social, political, and now, even of disciplinary dispute. Although expert witnesses can offer opinions where ordinary witnesses cannot, judges retain the power to constrain the occasions and the means by which they can express those opinions. When the legal philosopher Ronald Dworkin argued in *Law's Empire* that "the courts are the capitals...and judges are its princes," he meant to suggest that while each technical field may have its own concept of evidence, each citizen his or her own private epistemology, the law ultimately serves as the backdrop against which and within which evidentiary concepts are shaped, debated, and deployed.<sup>125</sup> In mocking deference to the law's empire following *Daubert*, Milich wondered whether scientists "must be amazed at the 'law's hubris' in thinking that nonscientist judges can 'get up to speed' on a scientific dispute and ultimately decide who has the better case."<sup>126</sup> Noting how judges compound this problem by insisting that scientific expert testimony function as totally unconditional, unqualified truth while

---

<sup>125</sup> Ronald Dworkin, *Law's Empire*, (Cambridge: Harvard University Press, 1986), 407.

<sup>126</sup> Paul Milich, "Controversial Science in the Courtroom: *Daubert* and the Law's Hubris," *Emory Law Journal* 43, no. 3, (1993): 919.

simultaneously bending to the constraints of legal authority, Beyea and Berger (2001) argue that this problem stems from the law's enshrinement of its own misunderstandings of science. In many legal cases, for instance, science is treated with the reverence religious persons might afford the holy texts of their faith, and expert witnesses Science's priests.<sup>127</sup> Consequently, they highlight the need for judges to take into account the subjective certainty that an individual expert witness has in his or her own statements and not simply the content of the statements themselves.

### **Expertise and the Appeal to Expert Authority as a Rhetorical Problem**

That the rhetorical problems of expert testimony begin where the scientific and legal problems seem to end, a word I use with some levity, only highlights how philosophy, science, and the law all have rhetorical dimensions that we neglect at our own peril. Plato, who famously complained in the *Gorgias* about the Sophists' capacity to make the worse argument appear better, would not express surprise at the prevalence and persistence of these problems. When we consider Plato's lament alongside the Athenian courtroom as the first social laboratory in which rhetoricians conducted their experiments, neither this fact nor the fact that Aristotle thought to include suggestions for dealing with the testimony of witnesses in his own *Rhetoric* should seem at all surprising. More particularly, the rhetorical nature of the philosophical and legal problems entailed by witness testimony has been acknowledged in the philosophical and legal literature alike. Brewer identifies the demeanor of an expert witness, which has been acknowledged to play a significant role in how attorneys, judges, and juries perceive the testimony of an expert witness, with Aristotle's concept of *ethos*.<sup>128</sup> And, while he observes that "we have no reason to believe

---

<sup>127</sup> Jan Beyea and Daniel Berger, "Scientific Misconceptions Among "Daubert" Gatekeepers: The Need for Reform of Expert Review Procedures", *Law and Contemporary Problems* 64, no. 2, (2001): 327-372.

<sup>128</sup> Scott Brewer, "Scientific Expert Testimony and Intellectual Due Process," in Sellinger and Crease, *The Philosophy of Expertise*, 140.

an expert witness's persuasive demeanor has any particular connection to the epistemic warrant for what the witness asserts,"<sup>129</sup> I wish to argue that this is precisely the point. For, regardless of whether an expert witness's testimony leads to *knowledge* in the sense of justified true belief, it does lead to belief that is operationalized in an eminently practical way, namely, as evidence in a legal case. This point has been acknowledged in the legal literature as well. As Herbert Kritzer has explained in a discussion of the conflicting rhetorical norms of the scientific and legal worlds, expert witness testimony presents a rhetorical problem because "although we like to think of the courtroom as a setting where we seek truth and justice, in reality the courtroom is fundamentally a world where the art of persuasion is paramount. Evidence, both technical and nontechnical, is presented to persuade."<sup>130</sup> Expert witness testimony, then, can be rightly studied as both a species of evidence and as a component of the larger public discourse in which all sorts of rhetors take part.

Just as philosophers and lawyers have increasingly investigated the problems of expert witness testimony, so too have rhetoricians attempted to direct their theoretical and methodological resources to discussing the problems created by expert witness testimony. Unfortunately, rhetoricians have not engaged with the concept and problems of expertise nearly as directly as have philosophers—the first monograph devoted to the topic did not even appear until 2010. In bits and pieces, though, rhetoricians have investigated the rhetorical nature of expertise, the appeal to expert authority as a specific argument form, the construction of expert ethos in public debates, and, of particular interest to a study of expert testimony, the roles that expert testimony plays in combatting *and* spreading misinformation. Far from a mere appendix

---

<sup>129</sup> Ibid, 140-141.

<sup>130</sup> Herbert Kritzer, "The Arts of Persuasion in Science and Law: Conflicting Norms in the Courtroom," *Law and Contemporary Problems*, 72, no. 1 (Winter 2009): 43.

to work in philosophy and law, this work conceptualizes expert testimony in the way that most Americans might encounter it – not as an abstract philosophical dilemma or a legal problem saturated in precedent and arcane rules, but as a social exchange between parties possessing unequal social and symbolic resources. The problem of epistemic dependence discussed above, then, becomes a matter of recognizing that the epistemic dependence of the layperson gives the expert *power* over the layperson’s decisions. Insofar as experts both persuade and citizens appeal to experts in order to persuade each other, the intersection of the rhetoric of expertise with the philosophy and law of expertise should seem obvious. In these days, though, one can never count on the obvious to appear so obvious, so I turn my attention now to outlining expert witness testimony’s rhetorical problem.

Understanding expertise as a rhetorical problem requires exploring, much as philosophers theorizing about the problem of epistemic dependence must do, the different discursive “spheres” in which people reason and dispute with each other. Consequently, the distinction between the personal, technical, and public spheres of argument, a distinction famously articulated by Thomas Goodnight, is foundational to the work undertaken here. Drawing on Kenneth Burke’s notion of identification through “consubstantiality,”<sup>131</sup> Organizing the three concepts according to the increasing standard of proof required to meet their demands, Goodnight posits the personal, technical, and public “spheres” as concepts capable of explaining how arguments both originate and, more importantly, mediate between the different areas of people’s lives.<sup>132</sup> As he puts it, “some disagreements are created in such a way as to require only

---

<sup>131</sup> Rhetoricians will generally be familiar with Burke’s ideas, but see Kenneth Burke, *A Rhetoric of Motives*, (Berkeley: University of California Press, 1969), 55-59 for a general discussion of Burke’s notion of “identification.”

<sup>132</sup> Thomas Goodnight, “The Personal, Technical, and Public Spheres of Argument: A Speculative Inquiry into the Art of Public Deliberation,” *Argument and Advocacy* 48, no. 4, (Spring 2012): 200.

the most informal demands for evidence, proof sequences, claim establishment, and language use.” Goodnight groups these arguments into the “personal sphere.” Arguments that “typify the technical sphere,” meanwhile, “are created in such a way as to narrow the range of permissible subject matter while requiring more specialized forms of reasoning.” Finally, arguments “transcending the personal and technical spheres” characterize the “public sphere” of argument, “a domain which, while not reducible to the argument practice of any group of social customs or professional communities, nevertheless may be influenced by them.”<sup>133</sup> From this basic distinction, Goodnight discusses how arguments about a given topic are transformed as they move back and forth between the various spheres, and he expresses particular concern that “even as politicians have come to rely upon pollsters and mass-communication strategists to formulate sophisticated rhetorics,” the public sphere is eroding because “audiences seem to disappear into socially fragmented groups,”<sup>134</sup> a concern that, for one first expressed in the early 1980’s, seems simultaneously sadly and appropriately anticipatory of the contemporary scholarly and media discussion of such phenomena as “echo chambers.” Goodnight’s concerns are worth taking seriously because expert witness testimony in and out of the courtroom, as both a species of evidence and as a means of exercising authority of all kinds, precisely illustrates the movement between argument spheres on which Goodnight predicates his ideas.

Early work on the rhetoric of expertise, anticipating the work of contemporary scholars, focused on how expert testimony functions as an argumentative warrant and as a means to construct ethos. Some rhetoricians classify the appeal to expertise or the *argumentum ad verucundiam* among the informal logical fallacies. Walton, for example, contends that the appeal

---

<sup>133</sup> Ibid, 202.

<sup>134</sup> Ibid, 206.

to expert opinion functions as a “warrant” in the Toulminian sense,<sup>135</sup> justifying the relationship between a given claim and datum.<sup>136</sup> While some good work has been done analyzing the way in which expert witness testimony functions as warrants in legal arguments, this work goes somewhat far afield. When Reddington, for example, contends that, as a result of having shown the sequence in which the Toulminian scheme plays out in testimony, “technical communication scholars are uniquely situated to address the difficulties jurors face,” the claim is hard to take seriously, for the legal environment is one that is just as technical the scientific environment.<sup>137</sup> It’s not, of course, impossible for rhetorical and discursive analyses to shed light on how language is used in these contexts, but that narrow value hardly bestows upon rhetoricians, technical communication analysts, or discourse analysts the expertise necessary to make recommendations *qua* the legal field itself.

Others have approached the appeal to expertise not as an argumentative problem as a problem in the construction of ethos. In a study of biologist E.O. Wilson’s book *Consilience*, for example, Lynne and Howe consider what happens when an expert in one field appeals to that expertise to speak about a field in which he or she lacks expertise. Wilson, they contend, blurs the conceptual lines of demarcation between biology, in which he is an expert, and sociology, in which he is not, in order to justify his interdisciplinary endeavor known as “sociobiology.” In doing so, he subsumes sociology within biology, transferring the disciplinary criteria of his field to the one subsumed, thus rendering the findings of one accountable to the standards and methods of the other. This demonstrates one posture that experts can take toward other experts.

---

<sup>135</sup> See Stephen Toulmin, *The Uses of Argument*, (Cambridge: Cambridge University Press, 2003), 89-100 for a general discussion of the concept of “warrant.”

<sup>136</sup> Douglas Walton, *Informal Logic: A Pragmatic Approach*, (Cambridge: Cambridge University Press, 2008), 20.

<sup>137</sup> Luke Reddington, “Methodology on Trial: The Rhetorical Function of Toulminian Warrants in Expert Testimony,” *Journal of Technical Writing and Communication* 47, no. 4 (2017): 415.

They can assume a sort of “meta-expertise” over another’s expertise by arranging various fields in a hierarchy, so that, consequently, the experts in one field become “reducible” to those in others. Significantly, Lynne and Howe observe that Wilson offers these moves *in lieu* of more typical scientific evidence, a consequence, perhaps, of Wilson’s presenting sociobiology to the public as though its central claims were settled scientifically when, in fact, they were still being debated. Consequently, they conclude that “scientific inquiry is, thus, conditioned by audience considerations at each moment when an inquirer ‘goes public’ by engaging another audience.”<sup>138</sup> Their observation helps to explain how, for example, movements like anti-evolutionism, scientific creationism, or intelligent design can seem wholly unintelligible to one group of people while abundantly obvious to another.

Unfortunately, much of Lynne and Howe’s critique of Wilson could also be said to apply to many of the scholars who have written on the rhetoric of expertise. The literature produced in the last thirty years, while sketching some useful concepts, also has tendency to veer into the same kind of “out of field” claims that Lynne and Howe observe Wilson making, particularly with respect to what the “ethical” or “civic obligations” of scientists are. This would not be so bad if the literature produced by rhetoricians engaged in a serious way with the problems produced by the philosophical or legal literature, both of which do an excellent job of articulating the numerous problems associated with expertise. Most of the literature to be found, though, does not even cite or evince awareness of highly developed philosophical literature on expertise. Consequently, the remaining literature on rhetoric typically, with some notable exceptions, offers vague musings about the nature of expertise instead of fully developed insights into the rhetorical

---

<sup>138</sup> John Lynne and Henry F. Howe, “The Rhetoric of Expertise: E.O. Wilson and Sociobiology,” *The Quarterly Journal of Speech* 76, no. 2, (1990): 149.

problems created by epistemic dependence and the appeal to expert authority in the court room. It is in part to address this deficit that I have written this dissertation.

More recent research has sought to enumerate and classify the rhetorical moves experts make when explaining the details of their fields to non-experts. This research also demonstrates the need for empirical investigation into expert witness testimony, for the act of actually speaking before a group requires far more ambiguity and potential for failure than the previously considered philosophical models of expertise, which seek to deal with expertise solely as a concept, might be capable of acknowledging. To wit, an audience does not simply download an expert's testimony into their brain, reduce it to a term in a syllogism, and then accept it or reject it. In a study of medical expert witness testimony in a 1797 case involving a slave first raped by her owner and then tried for the murder of her stillborn baby, Chaemsaithong identified four discursive activities actively used by experts to establish themselves as experts on the witness stand. In the first move, "self-identification," the witness simply "categorized himself as an expert, and, in so doing, constructed and in some case reinforced the status of difference between him and the interlocutor."<sup>139</sup> This allowed the witness to establish the basic difference between himself, the lawyer questioning him, and other witnesses. Associating himself with category-bound activities, the second discursive move identified by Chaemsaithong, meanwhile, allowed the witness to use the association of some activities, such as science, with "a particular category" of knowledge in order "invoke his status, thereby indexing expert identity."<sup>140</sup> In this case, this move enabled the witness to authoritatively deploy medical terms and other specialized grammatical constructions in his evaluation of physical evidence. Complementing the first two

---

<sup>139</sup> Krisda Chaemsaithong, "Performing Self on the Witness Stand: Stance and Relational Work in Expert Witness Testimony," *Discourse and Society* 23, no. 5 (2012): 481.

<sup>140</sup> *Ibid.*

moves with explicit reference to personal experience and training, the witness “was able to establish the fact that he had been involved in and exposed to a particular matter,” and that from this experience “he had gained wisdom as a result of subsequent reflection and interpretation.”<sup>141</sup> Consequently, the witness could utilize inferences that a witness without those specialized experiences could not utilize in judging the evidence of the case. Finally, by utilizing “discursive management of interaction,” the witness “anticipated the damaging effects of a question” and could respond effectively to challenges to his claims.<sup>142</sup> Although this study offers a useful typology of moves made by an expert witness, though, its focus on a historical case, a criminal trial, and the different rules of evidence applicable to that time period limit the degree to which generalizations relevant to the contemporary civil cases considered in this dissertation which, although they traverse the near-century between the Frye and the Daubert rules, remain confined, at least, to the same basic legal system.

In the first book-length consideration of the rhetoric of expertise, Hartelius identifies six different ways through which experts seek to establish, maintain, and manage their own expertise before an audience.<sup>143</sup> First, experts associate themselves with other experts. By pointing to people with established and recognized authority, new experts associate themselves with the achievements of those experts that their audiences already recognize and trust. Next, experts explain their methodologies. Such explanations, even when an audience lacks the technical knowledge to actually evaluate those methodologies, satisfy a cultural need for transparency so that everything is “out in the open.” Experts also make distinctions between their knowledge of a subject and the way in which they act out their professional lives. Such appeals tend to bring

---

<sup>141</sup> Ibid, 481-482.

<sup>142</sup> Ibid, 482.

<sup>143</sup> Hartelius, *The Rhetoric of Expertise*.

obtuse, abstract questions down to a level that lay audiences can understand while humanizing the expert, who can sometimes seem distant and detached from the immediate concerns of lay people. Sometimes, though, experts must simply ask that the audience defer to their knowledge, either by appealing to the complexity of the subject or by appealing to some other constraint, such as the time they would expend explaining every detail. Similarly self-serving, experts often construct rhetorical situations to which their particular expertise provides the best or only response. Finally, experts seek to relate themselves to non-expert situations and persons. This strategy allows experts to remind their audiences that they too face the same problems as everyone and while they may possess a particular form of socially sanctioned knowledge, they nevertheless understand the layperson and his or her dilemma. Having identified these strategies, which speak to the distinction between being correct and being believed that informed Plato's critique of the Sophists, Hartelius prepares us to appreciate expertise as a problem with aspects for which the expertise of rhetoricians, not philosophers or lawyers, provides the best response.

Building on Hartelius's work, Hikins and Cherwitz offer a useful articulation of a "rhetorical perspective" on the philosophical problems of expertise. Beginning by noting that expertise involves a *relation* between a speaker and an audience, they define the concept as "the capacity to make specialized veridical judgments about some aspect of non-human experience," in light of a philosophical position that they call *rhetorical perspectivism*.<sup>144</sup> Although rhetorical perspectivism involves a realist approach to ontology, consciousness, meaning, and epistemology, Hikins and Cherwitz distinguish their approach from the naïve realism of thinkers like Searle by observing that, while people *can* perceive an "external" world, "we are not aware of reality all at once, nor are our perspectives to be regarded as immediately independent

---

<sup>144</sup> Hikins and Cherwitz, 292.

truths.”<sup>145</sup> Consequently, while outright skepticism, especially the kind of skepticism that would make ontology, consciousness, meaning, and epistemology nothing but functions of language, is to be avoided, nor should the experience of the individual, expert or layperson alike, be taken to provide direct access to reality. In this project, I largely adopt Hikins and Cherwitz’s philosophical and rhetorical assumptions, especially their definition of expertise. I would only modify their definition of expertise slightly to focus it on the particular languages in which experts make their judgments. Expertise, as my study of the Scopes Trial, *McLean v. Arkansas*, and *Kitzmiller v. Dover* will show, grants experts, especially those testifying in court, not only the ability to make judgment about some aspect of the non-human world, but also the ability to use the particular grammatical resources and constructions of the language in which they make their utterances.

Other work has identified the communicative failures that occur when specific scientific experts communicating with the public conflate their technical *logos* with rhetorical *ethos*. Carolyn Miller, for instance, has offered a thoughtful, thorough exploration of the role that this particular move played in the public debate over nuclear reactors, which, despite much enthusiasm on the part of industry, failed to become as big a part of the United States’s power grid because of public fear of the risks associated with the failure of such a reactor. Examining the Atomic Energy Commission’s 1975 Reactor Safety Study, Miller observes that the rhetoric of risk assessment “exemplifies and promotes the presumption that expertise can substitute for ethos.”<sup>146</sup> This presumption not only makes it possible to use “expert opinion...to justify the use of expert opinion,”<sup>147</sup> it also enables rhetors to convert ethos into logos by “treating expert

---

<sup>145</sup> Ibid, 302.

<sup>146</sup> Carolyn Miller, “The Presumptions of Expertise: The Role of Ethos in Risk Analysis”, *Configurations* 12, no. 2 (Spring 2003): 175.

<sup>147</sup> Ibid, 180.

opinion as data and detaching it, to the extent possible, from the character that authorizes it.”<sup>148</sup>

More recently, others have observed a similar transformation in debates prompted by public health crises. Analyzing public health messaging during the 2014 Ebola epidemic, Celeste Condit argues that significant opportunities to bridge the gap between experts and “the public” were missed because medical experts such as CDC director Thomas Frieden and Anthony Fauci, director of the National Institute of Allergy and Infectious Disease, emphasized their personal scientific knowledge and credentials to the exclusion of other values operative in the debate. By failing to respect or even recognize “the alternative goods of the public” and, these two officials “made it impossible for the public health officials to occupy a position other than oppositional to these substantial members of their audience.”<sup>149</sup> As result, Condit suggests that expertise be “recast” as “at least in part a synthetic and contingent practice rather than objectified machinic production” and that “experts must honor the value of ethos as much as they value their expertise.”<sup>150</sup> It seems, though, that experts can learn from their past mistakes, for Fauci has recently been described by Ceccarelli as an “expert rhetor”<sup>151</sup> who “consistently characterizes himself as committed to the virtue of honesty”<sup>152</sup> and skillfully manages the “rhetoric versus reality” trope in his public appearances.<sup>153</sup>

While I don’t disagree with Miller and Condit that practicing experts *should* try harder to respect the values of the public, she seems to underestimate the difficulty of the task. Decisions are not made solely according to values, and, in the case of public health crises, understanding

---

<sup>148</sup> Ibid, 184.

<sup>149</sup> Celeste M. Condit, “Public Health Experts, Expertise, and Ebola: A Relational Theory of Ethos,” *Rhetoric and Public Affairs* 22, no. 2 (2019): 202.

<sup>150</sup> Ibid, 208.

<sup>151</sup> Leah Ceccarelli, “The Polysemic Facepalm: Fauci as Rhetorically Savvy Scientist Citizen,” *Philosophy and Rhetoric*, 53, no. 3 (2020): 241.

<sup>152</sup> Ibid.

<sup>153</sup> Ibid, 243.

something of the *logos* of the situation is required to understand *which* values will be useful in assessing risk. That, of course, is the problem—some members of the American public, who often display a *reflexive* hostility to *any* form of purported authority, are not capable of being persuaded to follow the advice of public health experts, bringing to mind the significance of the phrase “available means of persuasion” in Aristotle’s well-known definition of rhetoric.

Most work related to this topic in the last thirty years, though, has concerned itself less with expertise, experts, and expert testimony *as such* and more with serving as informational white blood cells attacking perceived sources of misinformation. Rhetoricians working along this line of thought have considered the role that experts have played in facilitating and distributing misinformation, namely in the form of bad or dubious science. While this work may seem closer to the cultural trenches than most scholars typically get, one should not forget that the Supreme Court adopted the Daubert Rule, the current standard governing the admissibility of expert witness testimony, specifically to combat the flood of dubious science that had been invading American courtrooms throughout the 20th century. So-called “junk science” includes everything from psychological testimony based on recovered memories to medical testimony concerning electronic fetal monitoring devices or other untested sources and has even prompted some doctors to call for a “national clearinghouse” of expert medical witnesses to combat this problem.<sup>154</sup> Hass and Kleine have noted five broad features in the rhetoric of junk science: 1) attacks on other scientists’ persons rather than work 2) exaggerated appeals to ethics 3) appeals to publications which have not been peer reviewed 4) the use of narrative instead of direct presentation of arguments and 5) claims to speak for science writ large.<sup>155</sup> In the last fifteen

---

<sup>154</sup> Cheryl Guttman, “Expert witness testimony tricky: M.D. suggests national expert witness clearinghouse,” *Dermatology Times* 9, no. 7 (2006): 36.

<sup>155</sup> Bruce Haas and Michael Kleine, “The Rhetoric of Junk Science,” *Technical Communication Quarterly* 12, no. 3 (2003): 234.

years, others, such as Aronson have documented how attorneys have deployed legitimate forensic scientific methods, such as DNA testing, to dubious ends by exaggerating the reliability of such methods or exploiting the relative ignorance of many jurors or judges.<sup>156</sup> More recently, Moreno has complained how even the Supreme Court, relying on testimony regarding the medically-dubious condition called “shaken baby syndrome,” has contributed to the very problem it hoped to combat with the Daubert rule.<sup>157</sup> Outside observers might wonder why the court system has devoted so much effort to combatting a problem which only seems to compound with time and the increasing pace at which new technologies influence our lives.

Such problems in the courtroom might be easy for the non-academic to ignore were they not indicative of larger problems in society. They stem from the nearly invincible prestige associated with the word “science” and with being able to call oneself a scientist and one’s work scientific – in simpler terms, rhetorical problems. This prestige has led even further disputes about what makes something scientific and what it means for scientists to dispute something between themselves, which Ceccarelli calls “manufactured scientific controversies.” In such controversies, a rhetor publicly maintains that the scientific community continues to debate a question when, in fact, scientists have reached consensus on it. Pointing to examples such as the “wedge strategy” advanced by the Discovery Institute, the intelligent design think tank based in Seattle (the primary intellectual advocates of intelligent design theory), Ceccarelli argues that this strategy functions by “exploiting a popular conception that science only advances when heroic dissidents push at the frontiers of normal science” in order to position their advocates as

---

<sup>156</sup> Jay Aronson, *Genetic Witness: Science, Law, and Controversy in the Making of DNA Profiling*, (New Brunswick: Rutgers University Press, 2007), 4-6.

<sup>157</sup> Joelle Moreno and Brian Holmgren, “Dissent into confusion: the Supreme Court, denialism, and the false “scientific” controversy over shaken baby syndrome,” *Utah Law Review* 2013, no. 1 (2013): 153.

underdogs nobly battling the unscientific and politically motivated orthodoxy imposed upon society by institutions which ought to be protecting and encouraging fair and open inquiry.<sup>158</sup>

More recent scholars have continued this line of thought. After the 2016 election, which many Americans viewed and continue to view as the triumph of misinformation over truth (to put the problem lightly), their concerns have seemed even sharper and more relevant. Working in a vein similar to Ceccarelli, Blancke, Boudry, and Pigliucci identify four further means by which rhetors have presented false scientific dilemmas to their audiences. While not rhetoricians by training or trade, their work, which identifies clearly rhetorical techniques, represents one of the latest efforts to understand how and why people believe things that established experts tell them not to believe. Using the first strategy, “exploiting epistemic vigilance,” proponents of pseudoscience, manufactured controversies, or other “alternative facts” exploit the expert-lay person distinction to present information to an audience that they could not possibly have the means to verify. As they put it, “scientific beliefs are often too difficult to comprehend for lay people, which makes content evaluation impossible. This difficulty leads people to accept, reject, scientific concepts mainly on the basis of trust,” which brings to mind the problem of epistemic dependence.<sup>159</sup> Next, rhetors exploit the cultural authority of science. No one, not even the princes of the law’s empire, will dispute that science stands at the abstract top of the intellectual hierarchy in contemporary society. Scientists deliver the technology that most Americans depend upon to live every single day. Without science, the television doesn’t turn on, the car doesn’t run, and the Internet doesn’t work. As they put the problem, though, “people also ascribe authority to

---

<sup>158</sup> Leah Ceccarelli, “Manufactured Scientific Controversy: Science, Rhetoric, and Public Debate,” *Rhetoric and Public Affairs*, 14, no. 2, (Summer 2011): 209.

<sup>159</sup> Stefaan Blancke, Maarten Boudry, and Massimo Pigliucci, “Why Do Irrational Beliefs Mimic Science? The Cultural Evolution of Pseudoscience,” *Theoria* 83, no. 1 (2017): 82.

science simply because science is already an established authority.”<sup>160</sup> In other words, challenging anything that a rhetor has established as “science” requires a great deal of effort that many people find themselves unwilling or unable to expend. This challenge contributes to third strategy Blancke et al identify: the use of the word science as an “honorific,” a linguistic ornament that conveys authority upon otherwise disputable propositions. This appeal speaks to the fact that even absent empirical data, the word science carries the cultural heft that complicated data itself might sometimes weigh down. Consider, for instance, the number of headlines online and in print that begin with the phrase “Science Says,” as though scientists had collectively gathered together and determined that non-scientific society needs to know a specific fact or idea. Finally, many scientists and non-scientists alike fall victim to “epistemic negligence.” Because “people are easily satisfied with explanations that they have come to accept on an intuitive basis or on the basis of trust,” scientists themselves often draw upon analogies, metaphors, and other techniques in order to make complicated ideas more palpable to an easily bored and distracted audience.<sup>161</sup> Popular examples include Richard Dawkins’s “selfish” gene, a personification that Blancke et al contend has led people to “assume that human altruism is nothing but egoism in disguise.” While these techniques certainly help people to believe that they understand science, the ultimate situation becomes one in which “science is pseudoscience, and vice versa.”<sup>162</sup> Nearly two and a half thousand years since Socrates first prompted Theateus to critically examine the Athenian juror, then, lawyers, rhetoricians, and philosophers seem trapped in a Platonic cave of expertise, enthralled by the endless array of strategies by which latter-day Sophists cast scientific shadows upon the walls and very few

---

<sup>160</sup> Ibid, 86.

<sup>161</sup> Ibid, 89.

<sup>162</sup> Ibid, 90-91.

means, if any, by which we may clearly determine who to trust and who to shun. The proliferation of academic articles dealing with phony scientific controversies or ideas in the last decade alongside the even more massive proliferation of phony scientific controversies and disputes, though, is somewhat limited in not going too far beyond enumerating, classifying, and explicating the strategies by which bad faith actors abuse our trust can really accomplish.

### **The Theoretical and Methodological Contributions of Linguistics**

While this dissertation seeks to answer questions fundamentally rhetorical and philosophical, my methodology borrows three notions from linguistics. Traditional rhetorical critics, for all their efforts to account for the legal and cultural influence of the appeal to expert opinion, have yet to account except in indirect ways for the particular linguistic affordances of English in specifically American institutions. Just as philosophers, lawyers, and rhetoricians have sought to account for the epistemological, legal, and rhetorical problems of expert witness testimony, linguists have discussed how specific languages offer various means by which individual speakers denote both the sources of their information and the degree of their own epistemic commitment to an individual claim.

Articulating the distinction between “epistemecity” and “evidentiality,” linguists have observed and explained the typology of epistemic markers across various languages, and the general function that epistemic marking plays in facilitating human interaction. Consequently, any empirical study conducted into any institutional procedures conducted in English, as typical American legal proceedings are, must account for the specific resources the English language offers its speakers and writers for meeting the epistemic demands of the various exigences they encounter. In modern Standard American English, by which I mean the tone, register, grammatical rules, rhetorical expectations, and other linguistic demands of American courts,

universities, and other institutions bearing the pretenses of official social and political approval, epistemic modal verbs offer one of the resources by which speakers and writers can meet these demands. My decision to feature epistemic modal verbs, then, follows from their prominence in the spoken and written grammatical and syntactic structure of English, as well as their prominence in both day to day and formal usage.

Broadly conceived, evidentiality, one of the linguistic concepts most central to the present work, relates to how a language codes for the various epistemic issues sketched above. How does a language mark the difference between things known for sure or merely believed? How do a language's users deploy its lexical and grammatical features to express doubt or certainty with respect to a proposition? These are just a few of the questions considered by linguistic work on this concept. At the most general level, languages differ between coding for *information source* and coding for *epistemic commitment*. A further distinction exists between grammatical markers of epistemic modality and lexical markers of epistemic modality – that is, between marking modality via changes in morphology, word position, or other lexical *transformations* and marking modality by adding words. Chafe's foundational empirical study of evidentiality in formal and academic written English defines "evidentiality" to include not only markers of "degrees of reliability" but also markers for information sources such.<sup>163</sup> To be precise, contemporary English combines three ways of coding for information source with four ways for coding for mode of knowing to express the varying degrees of reliability as matched against the writer's verbal resources and expectations. Sources of knowledge, for instance, include, evidence, language, and hypothesis. These three sources, in turn, lead belief, induction, hearsay, and deduction to function as four possible modes of knowing that, matched against a

---

<sup>163</sup> Wallace Chafe "Evidentiality in English Conversation and Academic Writing," in Wallace Chafe and Johanna Nichols, *Evidentiality: The Linguistic Coding of Epistemology*, (Ablex Publishing Corporation: 1986), 261-272.

speaker or writer's expectations and verbal resources for expressing degrees of doubt and commitment to a statement, result in a speaker or writer's statements.<sup>164</sup> Although Chafe deployed a small sample of only twenty written texts, this work provides much of the conceptual foundation for later work on evidentiality.

Of particular import, Chafe found that adverbs and epistemic modal verbs made up a large number of his sample's expressions for degree of reliability.<sup>165</sup> When considering this topic, adverbs like "probably" and "maybe" will immediately come to mind to most English users. Epistemic modal verbs, however, require a little more consideration. In English, epistemic modality, the term other scholars use where Chafe uses degree of reliability, is expressed through a system of verbs known as modal auxiliary verbs. While most scholars will recognize auxiliary verbs, fewer, perhaps, will have much formal knowledge of modality.

Although difficult to define, the concept of modality connects the rhetorical and philosophical problems discussed to the more general rhetorical and philosophical problems already touched upon. In the broadest sense, the term modality refers to the ways in which speakers express their opinions and attitudes not *through* their statements but *toward* their statements. In other words, modality helps speakers to convey to others more general information about the *function* of a given statement. More precise delineations are possible, however, and so linguists typically distinguish epistemic, deontic, and dynamic modality from each other.<sup>166</sup> The first two, which are themselves two of the four basic "modes" of logic distinguished by philosophers, have drawn a considerable amount of scholarly attention in the last fifty years. Epistemic modality concerns itself with "making a judgment about the truth of a

---

<sup>164</sup> Ibid, 262.

<sup>165</sup> Ibid, 264.

<sup>166</sup> Frank Palmer, *Modality and the English Modals*.

proposition” and serves a very important social function, allowing people to make conditional statements that, if somehow shown to be false, will insulate them from the accusation of having lied.<sup>167</sup> Since to even be accused of lying (even falsely accused) carries itself a strong social stigma, and in a courtroom entails an accusation of having also committed a crime, epistemic modality is connected to some extremely serious social and legal consequences. The epistemic modal verbs, then, require proportionately seriously attention.

Like other auxiliary verbs, epistemic modal verbs display four main characteristics. Linguists call these four features – inversion with the subject, a negative formed with –‘n’t, code, and emphatic affirmation – the “NICE” qualities. With all auxiliary verbs, a statement can be transformed into a question, for instance, by inverting the order of the subject and the modal, so that, for example, “I may come,” becomes “May I come?” Similarly, negation can be performed by appending “-n’t” to an auxiliary, so that English has forms like “He doesn’t care,” and “I musn’t do that.” At the same time, an auxiliary can be used to “code” a previously mentioned verb to avoid repeating it, as in a question like, “You should write your dissertation, shouldn’t you?” Finally, rising intonation on an auxiliary can be used to indicate emphasis. Compare, for instance, the difference between “I can finish my work,” and “I *can* finish my work.” These four features alone, then, make mastering the auxiliaries one of the most challenging and interesting aspects of English.

Since three additional qualities further distinguish the epistemic modals from the primary auxiliary verbs, though, the epistemic modals require some further comment. Possessing neither a third person singular, any non-finite forms, and incapable of being used in combination with each other, the epistemic modals signify a complex array of qualifications to more general

---

<sup>167</sup> Ibid, 6.

propositions. In the system used in English, the modals can be imagined as falling on a line with the concept of possibility at one pole and the concept of necessity at the other. Modeled thus, the paradigmatic epistemic modals become “may,” which indicates some variation of “it is possibly the case that x...,” and “must,” which indicatives some variation of “it is necessarily the case that x...” Clustered between these poles lie modals indicating more tentative knowledge: might, would, could, and should. Were the system so simple, however, epistemic modality might not pose so many challenges. Other verbs, such as “can,” and “will” are used in modal and non-modal ways, a fact making these verbs a little more difficult to study.

Bybee, Perkins, and Pagliuca, for example, argue for a clear distinction between epistemic modality, “the extent to which the speaker is committed to truth of the proposition,” and the source upon which a speaker has based their claim.<sup>168</sup> Aikhenvald goes even further, arguing that scholars should use the term “evidential” only to refer to the means by which speakers code information source.<sup>169</sup> Following these cues, the present project concerns itself narrowly with the rhetorical uses of coding epistemic modality to account for degrees of reliability, following the scale of possibility and necessity discussed in Bybee et al.<sup>170</sup> However, insofar as this dissertation focuses only on a single language, English, and a single way of marking modality – degree of reliability – within that language, the claims I make herein should be understood as narrowly focused by consequence. Indeed, I should not even hope my claims to be understood as applying even beyond the narrow scope of the three cases I consider. If I have related any significant discoveries at all in these pages, they constitute mere justifications for rhetoricians to afford more attention to the relationship between the rhetorical and linguistic

---

<sup>168</sup> Joan Bybee, Revere Perkins, and William Pagliuca, *The Evolution of Grammar: Tense, Aspect, and Modality in the Languages of the World*, (Chicago: University of Chicago Press, 1994), 179.

<sup>169</sup> Alexandra Aikhenvald, *Evidentiality*, (Oxford University Press, 2004), 3-4.

<sup>170</sup> Bybee, Perkins, and Paglicua, 180.

problems of modality and the epistemic and legal problems entailed by expert witness testimony – in other words, a simple starting point.

By means of the epistemic modal verbs, English speakers indicate their relative epistemic commitment to the various sentences they utter not, as some other languages do, through grammatical means such as the position of the word in the sentence but through additional words which indicate for listeners or readers a speaker or writer's relative degree of commitment to a given proposition. Scholars have noted that English speakers have access to a wide range of specific phrases, adverbs, modals, adjectives, nouns, and verb forms to indicate their epistemic commitment to a proposition. Obvious and paradigmatic examples of epistemic verb constructions in English, for example, include "I think," while paradigmatic adverbs such as "certainly" and "undoubtedly."<sup>171</sup> The present study proposes to focus on the role of the narrower category of epistemic modal verbs, such as "can," and "may," which, in contrast to adverbs, tend to denote a narrower range of possible meanings. Furthermore, the epistemic modal verbs cannot be used on their own, giving them a narrow range of possible uses. Taken together, these features make epistemic modal verbs easier to isolate as a means for studying the epistemic stance, the last concept that I borrow from linguistics.

Just as they do with other linguistic resources, speakers and writers use the epistemic affordances of particular languages to negotiate the interactional demands of various social situations. The term "epistemic stance" accounts for the means by which a speaker modifies their expressions of epistemic modality in order to meet various social demands, including not only "politeness/face saving" and "constructing one's authority or the relevant discourse statuses of

---

<sup>171</sup> Elise Karkkainen, *Epistemic Stance in English Conversation*, (Amsterdam/Philadelphia: John Benjamins Publishing Company, 2003).

participants” but also “regulating aspects of interaction.”<sup>172</sup> Most relevant to the present study, Karkainen also observes the role which epistemic stance plays in “displaying (true or ‘fake’) uncertainty.”<sup>173</sup> In other words, in their efforts to describe the epistemicity of specific languages, linguists have also isolated a significant concept that rhetoricians have yet to incorporate into their literature. By uniting this concept with that of the rhetorical stance, the speaker’s more general attitude toward and position within an argument, I investigate, using shifts in modality as a markers of shift in epistemic stance shifts in epistemic stance as markers of shifts in rhetorical stance, the relationship between the lexical resources of a language and the rhetorical situations a language’s users encounter in their lives.

I situate myself within the theoretical and methodological intersection of philosophy, law, rhetoric, and linguistics that I have just described. By providing the justificatory link between the alleged facts of a legal case and the conclusions which judges and juries reach, expert witness testimony functions as a warrant in the Toulminian sense of the term. Consequently, rhetoricians have an interest in understanding the general ways in which expert witness testimony functions. Because sentence-level manifestations of epistemic modality likewise indicate a speaker’s attempt to negotiate the specific demands of a social situation such as a trial, studying the ways in which expert witnesses use modals to modify their expressed epistemic stance allows us to conceive of the “epistemic stance” as part and parcel of the “rhetorical stance.” This concept, as first enumerated by Booth, refers to the complex of “available arguments about the subject itself,” combined with the “interests and peculiarities of the audience” and the “implied character of the speaker.”<sup>174</sup> Accordingly, this dissertation provides an account of the relationship between

---

<sup>172</sup> Ibid, 27.

<sup>173</sup> Ibid.

<sup>174</sup> Booth, “The Rhetorical Stance,” 141.

the epistemic stance and the rhetorical stance, suggesting that the one be thought of as part of the other, and that, combined, they offer invite research simultaneously practical and theoretical in its orientation, bridging an important gap between the more specific and esoteric concerns of scholars and the more general and pragmatic concerns of non-specialists.

This dissertation likewise addresses the absence of research that explicitly unites the representation of scientific discourse in American courtrooms with the specific methodologies of rhetoric and linguistics. Earlier studies employing such methods did not attempt to study expert witness testimony as a specific kind of legal evidence and argumentative warrant. Meanwhile, more recent work has employed similar methods to the present study but has focused on scientific discourse as such. Hyland, for example,<sup>175</sup> has conducted a book-length study of how sentence-level linguistic features of scientific writing such as the passive voice and impersonal constructions relate to the rhetorical and disciplinary function of the scientific article. One previous study has analyzed the expert testimony in *Kitzmilller v. Dover*, but only in excerpts and without a specific focus on modality.<sup>176</sup> More recently, a book-length discourse analysis of the US press's coverage of the creation/evolution debate has offered a nuanced, empirical look at this issue.<sup>177</sup> Surveying corpora of press coverage contemporaneous to the Scopes Trial and *Kitzmilller v. Dover*, this important study reveals, contrary to some popularly repeated claims, a much more balanced look at support for evolution and, more importantly, the relatively low degree to which Americans broadly held to the ideas of young-earth creationism, which is often represented in history as having been so commonly believed by Americans that it was almost

---

<sup>175</sup> Ken Hyland, *Disciplinary Discourses: Social Interactions in Academic Writing*, (Ann Arbor: University of Michigan Press, 2004).

<sup>176</sup> Don Winiecki, "The Expert Witness and Courtroom Discourse: Applying Micro and Macro Forms of Discourse Analysis to Study Process and the 'Doings of Doings' for Individuals and for Society," *Discourse and Society* 19, no. 6 (2008): 765-781.

<sup>177</sup> Shala Barczewska. *Conceptualizing Evolution Education: A Corpus-Based Analysis of US Press Discourse*. (Cambridge Scholars Publisher: Newcastle upon Tyne, UK, 2017).

typical.<sup>178</sup> Before proceeding to a more specific explanation of my methodology, though, I offer a brief history of how the concept of expert witness testimony has developed throughout the last century, shifting from a concept about which scholars and jurists alike effaced general agreement to one surrounded by some of the most contentious ongoing legal and scholarly disputes.

### **The Establishment Clause, Anti-Evolutionism, Creation Science, and Intelligent Design in the Courtroom**

Of all the amendments to The Constitution, the First Amendment has been one of the most contested since its ratification. Owing to the United States' relative religious homogeneity, the Establishment Clause, however, did not become widely disputed until the 20<sup>th</sup> century. As the Supreme Court began to incorporate the Bill of Rights to the states and questions over government subsidies for private religious schools, state-sponsored school prayer, and, of course, evolution divided judges and juries alike, two distinct positions began to emerge.

Many Americans think of the Scopes Monkey Trial, the State of Tennessee v. John Thomas Scopes, a case in which high school biology teacher John Scopes was convicted and fined (though the conviction was later overturned) for teaching Darwinian evolution in the small town of Dayton, Tennessee as the beginning of the legal conflict between evolution and creation. However, this case did not in fact establish legal precedent. Since the judge in the case had imposed Scopes's sentence of a \$100 fine himself rather than trusting it to the jury as the Tennessee Constitution required, The Supreme Court of the state had, in an effort to rid its state of the worldwide negative press caused by the verdict, dismissed Scopes's conviction.

Nevertheless, because The Scopes Trial continues to serve as both an official and unofficial metonym for the dispute over evolution in both textbooks and American culture more generally,

---

<sup>178</sup> Ibid, 64. Barczewska specifically contradicts the claims of Edward Caudill and Ronald Numbers, both of whom are cited elsewhere in this dissertation.

chapter two offers discourse analysis of the limited expert witness testimony delivered in that case.

Not until 1968's *Epperson v. Arkansas*, wherein The Supreme Court of the United States ruled unconstitutional statutes prohibiting the teaching of evolution, such as The Butler Act, the statute which resulted in Scopes's conviction, under the Establishment Clause of the First Amendment to the Constitution, did the most legally consequential courtroom battles begin. While I do not offer here a complete history of the legal conflict surrounding the debate over evolution, many such accounts exist,<sup>179</sup> the account I offer illustrates how the philosophical, rhetorical, and linguistic problems discussed earlier manifest themselves in legal conflicts. At the same time, this review demonstrates how the epistemic issues of problems of justification, in particular with respect to scientific expert witness testimony, lie at the very heart of the dispute surrounding evolution in the classroom.

While the first half of the twentieth century saw a social, political, and legal climate generally inhospitable to evolution's place in the science classroom, The Supreme Court's decision in *Epperson* shifted the debate in favor of evolution's defenders, the social, legal, and political direction in which it still generally tends. Three years after *Epperson*, The Supreme Court established in 1971's *Lemon v. Kurtzman* the legal test that to this day remains the standard in Establishment Clause jurisprudence. In 1968, the state of Pennsylvania had enacted a statute that set aside \$24 million to reimburse private, sectarian schools for the costs associated with educational services such as providing textbooks. Ruling that this act violated the Establishment Clause by tying the state too closely to religious groups, The Supreme Court

---

<sup>179</sup> In particular, Edward Larson, *Trial and Error: The American Controversy Over Creation and Evolution*, (Oxford, New York: Oxford University Press, 2003), offers a complete discussion of the legal history of this conflict that includes a thorough discussion of each particular case reviewed here.

established The Lemon Test to serve as a heuristic for adjudicating such disputes in the future. According to the Lemon Test, a statute must meet three criteria to fall within the limits set by The Establishment Clause. A statute (1) must demonstrate “a secular legislative purpose,” (2) “its principal or primary effect must be one that neither advances nor inhibits religion,” and (3) it cannot create “an excessive government entanglement with religion.” This “three-pronged” test sets a standard that a statute must meet in all respects, so that if it fails to meet one bar of the test, it fails to meet them all. Although the constitutionality of The Lemon Test has been challenged in subsequent litigation, such challenges have, thus far, proven unsuccessful. Today, this test is the standard against which Establishment Clause arguments are measured, so its significance cannot be understated.

The significance of expert testimony to applications of the Lemon Test emerges immediately when considering the 1982 decision in *McLean v. Arkansas Board of Education*. This case, a kind of sequel to the Scopes Trial, will serve as the subject of chapter three. McLean emerged after Arkansas Governor Frank White signed the 1981 “Balanced Treatment for Creation-Science and Evolution-Science Act” requiring that schools teaching Darwinian evolution devote an equal amount of time to a field calling itself “creation science,” which emerged in the 1930’s as an attempt to reconcile the Biblical story of Genesis with the findings of modern science.<sup>180</sup> The many subfields of Creation Science, which continues to be pursued by organizations such as The Institute for Creation Research, included, for instance, flood geology, which attempted to trace the Biblical account of the flood that covered the Earth through the geological record. McLean is significant not only because Judge William Overton ruled that such “equal time” acts violated the Establishment Clause, but also because he relied, as Judge John

---

<sup>180</sup> Ronald Numbers, *The Creationists: From Scientific Creationism to Intelligent Design*, (Cambridge, Massachusetts: Harvard University Press, 2006), 127.

Jones did later in *Kitzmiller v. Dover*, the subject of chapter three, on abundant expert testimony to proffer five “essential characteristics of science.” According to Overton’s ruling, a field must demonstrate five qualities to count as science. A field must be 1) “guided by natural law,” 2) be “explanatory by reference to nature law,” 3) “testable against the empirical world” while 4) offering “conclusions [that] are tentative” and 5) “falsifiable.” On these grounds, Overton ruled that creation science could not be considered science. Indeed, he ruled that creation science failed to meet *every one* of these criteria. Overton found the claims of creation science proponents such as evangelical pastor Norman Geisler, who would later write his own rebuttal of Overton, to fail in particular with respect falsifiability. Like intelligent design, promulgated today by organizations like The Discovery Institute, which many contemporary scholars think of as the next stage in the “evolution” of creation science, creation science was found not so much to make *false* claims as to make claims that could not be proven true or false at all. Similarly important, the legal question in this case, hinging as it did on extralegal questions in the philosophy and rhetoric of science, forged a clear link between fields that the cultural and institutional barriers of the contemporary university might otherwise obscure. Without belaboring the point, we see in *McLean* how the problem of demarcation migrated from the pages of Popper to the courtroom.

Despite the hard blow dealt to creation science by Overton’s ruling, a creation science decision with indisputably national implications had yet to be made. Since *McLean* was heard by a District Court, the ruling’s force extended only as far as the Eastern District of Arkansas’s jurisdiction. It wasn’t until 1987, in *Edwards v. Aguillard*, that the US Supreme Court became involved in determining whether creation science constituted a religious or scientific worldview. Illustrating the significance of the Lemon Test, the Court upheld rulings of the Fifth Circuit

Court of Appeals and the District Court for the Eastern District of Louisiana, which struck down Louisiana's own "Creationism Act." Like Arkansas's Balance Treatment Act, Louisiana's "Balanced Treatment for Creation-Science and Evolution-Science" Act required that public schools afford equal time to the teaching of evolution and creation science. The Supreme Court rejected the act for reasons similar to the lines it previously pursued in *Lemon v. Kurtzman* while relying on the definition of science offered by Overton in *McLean*. First, noting that the Act's avowed secular purpose of advancing academic freedom was undermined by "requiring that curriculum guides be developed and resource services supplied for teaching creationism but not for teaching evolution" and second by constituting an endorsement of religion by "advancing the religious belief that a supernatural being created humankind," the Court concluded that Louisiana's statute failed the Lemon Test. In another parallel to creation science, today's intelligent design activists continue to deploy this line of reasoning, which purports only to illustrate explanations for natural phenomena simply seen as alternative to evolution. In the same vein, creation scientists argued that academic freedom required that their views be given just as much time as evolution so as to foster a diversity of perspectives.<sup>181</sup> Though the Court accepted neither the academic freedom nor the non-religious creator lines of argument advanced by creation scientists, its ruling did not put these two particular lines to rest, as became apparent in *Kitzmiller v. Dover*. Of more import to the present project, The Supreme Court in *Edwards* directly applied Overton's definition of science and adopted his line of reasoning with respect to the questions in *Epperson*. Since Overton had drawn his definition from expert witness testimony, in particular that of the philosopher of science Michael Ruse, the Court's ruling in *Edwards* illustrates a more general point about the power of expert witness testimony. When the

---

<sup>181</sup> Although I won't push this analogy too far, one can observe similar reasoning in the scholars who today label themselves the "Heterodox Academy."

law borrows a concept, whether from science, philosophy, or, perhaps more laughably, from rhetoric or linguistics, that concept takes on the force of law. Academic debate may continue, as it did and has<sup>182</sup>, but as a *regulatory force*, a specific disciplinary notion becomes part of the common structure of society. This point, to which I will return later, has vast implications for how we understand the ways in which experts' judgments structure our lives.

Since *Edwards*, state legislatures have largely stepped away from creation science in general and the evolution controversy in particular. Individual educators, nevertheless, have still sought to teach creation science. In the kind of local activism later evidenced in *Kitzmiller v. Dover*, for example, Raymond Webster, a teacher in the school district of New Lenox, Illinois, sought to teach creation science in his individual classroom, arguing in 1989's *Webster v. New Lenox School District* that the school's attempt to stop him violated his right to free speech and academic freedom. From the precedent set by *Edwards*, the District Court for the Northern District of Illinois ruled that school districts may exercise such control over their teacher's curriculum without violating their speech rights on the grounds that school districts have "the responsibility of ensuring that the Establishment Clause is not violated." Though the school board in *Kitzmiller* proved decidedly more hostile to evolution than that in *Webster*, this earlier case remains significant for establishing the individual duties of local school boards pursuant to federal precedent regarding conflicts between intelligent design and evolution. Indeed, *Kitzmiller v. Dover* began after a local school board had required individual teachers to read a statement speaking of the "gaps" in Darwinian evolution to their biology classes. By the end of the 20<sup>th</sup> century, individual teachers' interactions with their pupils rather than broad, curricular decision had, as in *Scopes*, re-emerged as the locus of conflict.

---

<sup>182</sup> Indeed, many scholars criticized Ruse's testimony and the Court's reliance on it.

Two additional cases offer from the early 2000's illustrate how the legal dispute shifted from curricular dispute to more direct regulation of pupil-instructor interaction. Though not ultimately decided until May 2006, a few months after *Kitzmiller* had been decided, the Northern District Court of Georgia's *Selman v. Cobb County School District* illustrates the more general trend in which that case participated. The Cobb County School Board in Atlanta, Georgia required that the district's high school biology textbook be affixed with a sticker reading, "This textbook contains material on evolution. Evolution is a theory, not a fact, regarding the origin of living things. This material should be approached with an open mind, studied carefully, and critically considered," a move similar to the anti-evolution statement that the Dover School Board had required teachers to read to students. Though the Northern Georgia District Court originally ruled on January 13, 2005 (a mere eleven months before *Kitzmiller*) that the sticker failed to meet the standard of the Lemon Test, the decision was overturned and remanded the Eleventh Circuit Court of Appeals. Ultimately settled out of court in favor of the plaintiffs, this case illustrates that the anti-evolution activism in *Kitzmiller v. Dover* represents how the general strategy of Darwinian evolution's opponents has evolved since Scopes while remaining fundamentally the same. Going from a dominant position in which evolution could be banned outright to a compromised position in which they found equal time impossible to secure, evolution's opponents now seemed poised to lose their last bit of ground, going extinct with a whimper contrastable only with the bang of William Jennings Bryan's oratory only a century before.

One last case should illustrate how current legal disputes over evolution draw together the philosophical, rhetorical, and linguistic problems explored here. Decided in June 2005, just under six months before *Kitzmiller*, *McReary County, KY v. ACLU* had immediate implications

for how the former case could be decided. Pursuant to this case, The US Supreme Court ruled that a public display of the Ten Commandments in Kentucky violated the Establishment Clause. Despite having nothing to do with evolution, creation science, or intelligent design, this case deserves note because attorneys for McReary County, the Kentucky county that had erected the contested monument, issued a direct challenge to the constitutionality of the Lemon Test. Pointing to the impossibility of knowing whether a piece of legislation truly has a secular or religious purpose (the first prong of the Lemon Test), they argued the Lemon Test had provided “an excuse for courts to act selectively.” Upholding the decision of a lower court and the Lemon Test, though, the Supreme Court ruled that such displays violated the Establishment Clause. Nevertheless, Justice Antonin Scalia, joined by three other justices, issued a dissenting opinion, which agreed with the challenge and argued that the Lemon Test has “been manipulated to fit whatever result the Court aimed to achieve.” Taken together, *Selman* and *McReary* illustrate how the three cases analyzed in chapters two through four do not represent isolated questions, but fit instead into a more general legal and cultural dispute concerning evolution’s role in public school science classrooms. At the same time, considering the philosophical, rhetorical, and linguistic questions of this dissertation as legal questions show how these questions ultimately terminate in questions about *power*, about who will set the rules of discourse, who will enforce them, and, perhaps most importantly, who will simply obey them.

### **Method**

Working from the available transcripts of expert witness testimony delivered in *Scopes v. Tennessee*, *McLean v. Arkansas*, and *Kitzmiller v. Dover*, I ask three research questions: First, How do expert witnesses deploy concord with or opposition to the mainstream of a discipline to establish their authority? Recent psychological research has suggested that mock jurors rate

witnesses who perform confidently on the witness stand as more reliable than those who don't, even after researchers have informed them about mistakes in a given expert's testimony.<sup>183</sup> Consequently, we might expect that the parties of witnesses who efface an epistemic stance betraying more certainty than others to experience greater success. More specifically to the English language, I also ask: how do rhetors use modal verbs in the performance of certainty on the witness stand? In my later analysis of modal verb usage, I will show how modal verb usage makes a specific difference in the distinction between the "expert," "counter-expert," and "para-expert" epistemic stances. Finally, what does modal verb usage reveal about a rhetor's broader stance and what moves toward expertise are modalized statements correlated with? It is important to remember that although I offer an analysis of texts taken from the American courtroom, the courtroom merely provides the scene through which I explore questions which are more philosophical, rhetorical, and linguistic in nature. These disciplines, separated as they have been by both the cultural and institutional trends of the last several centuries of Western thought, have much to learn from each other. I intend for this study to ultimately serve as a modest contribution toward those ends.

Since I relied on transcripts prepared by the government rather than my own transcription, I followed three basic steps in approaching each case. First, I coded the selected testimony from each case according to the appearances of the eight "core" epistemic modal verbs identified by Palmer. I coded these verbs, which include "may," "might," "must," "could," "would," "should," "can," and "will," according to how different speakers use them to modify their expressed certainty relative to a given topic. While this list does not include all of the English modal verbs, nor does it include all of the English words used to mark epistemic stance

---

<sup>183</sup> Stanley Brodsky, Michael P Griffin, and Robert J. Cramer "The Witness Credibility Scale: An Outcome Measure for Expert Witness Research." *Behavioral Sciences & the Law* 28, no. 6 (2010): 892-907.

(such as adverbs), this list does include the core of epistemic expression made possible by the language. Arranged on a scale from “can,” which represents the lowest possible level of epistemic commitment to “must,” which represents the highest, coding these verbs allowed me to understand how a speaker’s epistemic and rhetorical positions shifted throughout a given interaction and to correlate specific modifications of modality with specific rhetorical moves.

Using the corpus analysis software AntConc, I analyzed the corpus of testimony generated by each case for the frequency and context of the eight epistemic English modal verbs, would, could, should, may, might, must, can, will, and shall. I also looked for negations of these words, including contracted forms such as shouldn’t, wouldn’t, couldn’t, and won’t, etc. These modal verbs provide insight into how expert witnesses qualify their claims while on the stand. Before I could analyze the corpus of testimony, however, I had to prepare my dataset. This task proved challenging because, while the court recorded each witness’s testimony in real time, the formatting of the documents produced by the court did not immediately lend itself to analysis by software. Consequently, I had to convert each witness’s testimony into plain text before removing such things as line numbers, page numbers, and other official information included in the transcript but not actually a part of the spoken testimony of the witnesses, the attorneys, or the judge. Where the Scopes Trial was concerned, no readily usable digital editions of the two expert witnesses who testified could be found. Consequently, I first retyped each of the expert witness’s testimony into a word processing software before cleaning the text for analysis, a task that took a considerable amount of time.

I conducted my analysis in three stages, grouping my data not only according to each individual stage of the trial, but also according to the discipline to which each witness belonged. First, I examined each witness’s testimony according to its individual parts, dividing each corpus

of testimony into direct examination, cross examination, redirect examination, and recross examination, though not each witness went through all four of these stages of examination. After analyzing each individual section of testimony, I looked at each witness's testimony as a whole, which allowed me to observe trends in modal verb use across the witness's entire testimony. In each of the subsequent chapters, I have constructed charts that allow a broad view of the relationship between rhetoric and modality in each witness's testimony.

Through this simple method, I sought to examine trends across my cases as a whole and also to examine trends internal to each individual case. I also used this method to develop a general profile of each academic field represented so that other scholars might have specific discursive features to test future work against. While far from a comprehensive statistical analysis, my method also demonstrated the benefits for rhetoricians in engaging in small amounts of quantitative work. Without seeking to depart from the humanistic tradition of rhetoric, this study was also begun in recognition of the fact that humanists can ill afford the innumeracy and antagonism toward quantification that often characterizes their respective fields.

Each of the following chapters deals with a different issue of contested science and features testimony particular to different fields in addition to focusing on a different one of the problems surveyed earlier. Chapter two reviews the intellectual history of evolutionary theory, the terminology of the conflict thesis, and the general rhetorical tropes associated with debates over evolution's role in American schools. Chapter three deals with *Scopes v. Tennessee*, noting in particular how general notions of expertise have changed in the near century since the case brought international attention to the tiny town of Dayton, Tennessee. In particular, this chapter analyzes the shifting role that modality plays in the testimony of zoologist Maynard Metcalf, whose words have never been made the object of any serious study, and that of William Jennings

Bryan, whose famous cross-examination by Clarence Darrow has perhaps become a synecdoche for the entire trial and, in some of the literature, the general “conflict” between science and religion. Chapter four discusses *McLean v. Arkansas*, assessing the new prominence of expert witness testimony in assisting litigation, particularly that of philosopher of biology Michael Ruse, whose testimony directly informed the legal definition of science promulgated by Judge Overton. Chapter five discusses *Kitzmiller v. Dover* with particular attention to biology, chemistry, and Popper’s problem of demarcation under the *Daubert* rule. Although each chapter deals with a legal case, I take care to position my claims as those of a rhetorician, avoiding making conclusions about the law as *the law* so that I might avoid the very extension expertise in one field to another that so many scholars have criticized. In chapter six, I address what my study has revealed about the problems in rhetoric, philosophy, law, and linguistics that I have discussed, develops the distinction between the “expert,” “anti-expert,” “counter-expert,” and “para-expert” epistemic/rhetorical stances, and discusses how these stances are deployed in contemporary right-wing discourse, particularly in the ongoing dispute over Critical Race Theory’s role in schools’ curricula. I take particular care to emphasize the primarily rhetorical, linguistic, and philosophical nature of my claims, avoiding suggestions which might call for any direct interventions in law or legal procedure. Second, I discuss my project’s methodological implications for future attempts to synthesize the concepts of rhetoricians and linguists. Here I pay particular attention to explaining my discoveries concerning the relationship between rhetorical stance and epistemic stance, particularly with respect to success in litigation. Finally, I will attempt to address a question that I raised earlier: how can rhetoric, philosophy, law, and linguistics work together to yield theoretically interesting and socially useful knowledge about language in use? In my closing remarks, I argue for the unique capacity of projects like mine to

investigate questions common to multiple disciplines while noting that it is only by recognizing their distinctions that we can also recognize their intersections. In the end, this dissertation contributes to both theoretical and practical related to how we understand our relationship to expertise and the experts that embody it, a problem that has only increased in interest and potential as the century has progressed.

## Chapter 2

### Nineteenth and Twentieth Century Antecedents

Just as the terms anti-evolutionism, creation science, and intelligent design refer to distinct concepts, the Scopes Trial, *McLean v. Arkansas*, and *Kitzmiller v. Dover* all considered unique legal questions. Nevertheless, scholarly, public, and, more specifically, legal disputes involving these concepts are typically conducted within relatively narrow, stable terminological and conceptual boundaries. To facilitate the reader's understanding when I refer to these concepts later, this chapter reviews some of the major terms and concepts common to all three of the legal cases studied in subsequent chapters. More particularly, I discuss how the conflict thesis — the idea that “science” and “religion,” however one defines those terms, have an inherently tense, perhaps impossibly tense relationship — emerged from 19<sup>th</sup> century debates in geology, biology, and theology. Understanding these debates prepares one to understand the issues and testimony in *Scopes*, *McLean*, and *Kitzmiller* because anti-evolutionism, creation science, and intelligent design advocates have all, to various degrees, structured their claims either within the parameters of the conflict thesis or as alternatives to it. The latter position is especially favored by intelligent design activists. I also use this chapter to discuss the origins of Fundamentalist Christianity in the 19<sup>th</sup> century and the Fundamentalist critique of Modernist Biblical criticism, which, as the 20<sup>th</sup> century began, was producing new interpretations of old questions, such as the age of the earth and the historical veracity of Genesis. While these questions may seem somewhat specialized, my later analysis of expert witness testimony in *Scopes*, *McLean*, and *Kitzmiller* will show how rhetors embodying the anti-expert, counter-expert, and para-expert stances deploy modalized expressions to either identify with or disassociate themselves from particular answers with respect to these questions in order to construct their respective epistemic and rhetorical stances.

### **Geological, Biological, and Theological Antecedents of the Conflict Thesis**

Like Darwin's theory of evolution, the conflict thesis began amidst the more general academic disputes of the 19<sup>th</sup> century. Two revolutions in the natural sciences, one in geology, the other in biology, transformed the way some intellectuals saw the relationship between science and religion while generating a strong negative response from clerics and theologians alike. In geology, two competing geological theses – catastrophism and uniformitarianism – concerning the formation and physical age of the Earth caused scientists first in Britain and later elsewhere, to repudiate the planetary chronology originally promulgated by such figures as Bishop Usher, a 16<sup>th</sup> and 17<sup>th</sup> century prelate of the Church of Ireland. In his 1654 work *Annals of the World*, Usher had attempted to infer the age of the Earth by tracing the generations of man back from the present to Jesus and from Jesus to Adam, arriving at 4004 BC as the year of creation. In the early 19<sup>th</sup> century, Usher's chronology remained a view widely throughout both the British Empire and the United States. Both catastrophism and uniformitarianism, however, challenged the Usher chronology by offering explanations of geological data that required the earth to be far greater than the roughly 6,000 years established by the Usher chronology. Indeed, in an even more significant departure from the scientific orthodoxy of the past and the religious orthodoxy of the present, both theories attempted to explain geological change in entirely naturalistic terms.<sup>184</sup>

Catastrophism and uniformitarianism emerged as competing explanations prompted by practitioners of the nascent science of geology's desire to both improve its methods and also to

---

<sup>184</sup> See Michael Ruse, *The Evolution-Creation Struggle*, (Cambridge, Massachusetts; London, England: Harvard University Press, 2006), 28 – 41 for a discussion of how the new approach to natural sciences stemmed out of various approaches to Enlightenment era debates in philosophy.

explain a wider variety of data. More specifically, geologists wanted to explain why fossils of different species were found in different strata of volcanic and sedimentary rock such that each strata had its own unique collection of species. Catastrophism, developed by the French naturalist Georges Cuvier, suggested that “at various times in the past drastic catastrophes had destroyed all life, and subsequently there had been new creations of quite different species.”<sup>185</sup> Although Cuvier’s catastrophism had a number of proponents, Darwin would ultimately be more informed by his fellow Englishman, Charles Lyell, who advocated the geological theory known as “uniformitarianism.”

Uniformitarians like Lyell contended that geological change happened gradually rather than suddenly. In the 1830 book *Principles of Geology*, which Michael Ruse credits for “Darwin’s shift from natural theology to deism,” Lyell contended that the Earth had been formed by natural processes still active in the present.<sup>186</sup> Significant for Darwin’s work, geologists could now explain such things as the age of the earth and the fossil record not in the thousands of years suggested by clerical figures like Usher, but in the millions of years required to deposit fossils in so many diverse layers as geologists now observed.<sup>187</sup> Though it was not known exactly how long it had taken for the observed geological strata to form, “their total thickness was known to be many miles, and that amount of deposition would not be possible if creation had taken place only a few thousand years ago.”<sup>188</sup> Lyell’s ideas immediately prompted both condemnation by church figures and attempts at reconciliation between the Bible and his geological revolution.

---

<sup>185</sup> John Moore, *From Genesis to Genetics: The Case of Evolution and Creationism*. Berkeley and Los Angeles: University of California Press, 2002, 60. Pages 56 – 64 of the same monograph offer a detailed discussion of the issues in geology that Darwin considered as he developed the theory of evolution by natural selection.

<sup>186</sup> Ruse, *The Evolution-Creation Struggle*, 67.

<sup>187</sup> Moore, 63 – 64.

<sup>188</sup> *Ibid*, 82.

Just as significant as the revolution in geology, the emergence of theories of evolution changed the way biologists viewed human beings' relationship to other animal species. Eventually, such theories would complement geological uniformitarianism in challenging the traditional, ecclesiastical view of planetary and human origins. Burdened by the conceptual fossil of Aristotelian scientific categories, which asserted the immutability of species, most biologists in the late 18<sup>th</sup> and early 19<sup>th</sup> century would have objected to evolutionary theory on account of scientific rather than religious suppositions. During the so-called long 19<sup>th</sup> century, two distinct theories of evolution emerge. Erasmus Darwin, grandfather of the man for which the term "Darwinism" would be coined, proposed the first biological theory that might be called "evolutionary" in *Zoonomia*, a work published in individual sections between 1794 and 1796. Lacking the language of genetics and without specifying a mechanism of evolutionary action, Erasmus Darwin proposed that "our immortal part acquires during life certain habits of action or of sentiment, which become for ever indissoluble, continuing after death in a future state of existence."<sup>189</sup>

Another early theory of evolution, proposed by French biologist Jean-Baptiste LaMarck in his 1809 book *Philosophie Zoologique*, outlined a pre-Darwinian model of evolution, one that proposed the transmutation of one species to another in response to environmental influences. Significantly, LaMarck did not, as Darwin later would, propose that all species possess a common ancestor. Instead, he suggested that organisms acquired different characteristics throughout their lifetimes and passed them onto their offspring. Consequently, the long neck of the giraffe, according to famous example given by LaMarck, can be explained by suggesting that generations of adult giraffes have acquired slightly longer necks than their parents by stretching

---

<sup>189</sup> Erasmus Darwin, *Zoonomia* in Christian Young and Mark Largent *Evolutionism and Creationism: A Documentary and Reference Guide* (Westport, Connecticut: Greenwood Press, 2007).

their muscles in order to reach food in their environment, thus lengthening their necks, and then passing such acquired traits on to their offspring. Thus, infant giraffes begin their lives with longer necks than either their parents or grandparents did and end their lives with consequently longer necks than which they began their lives. Over thousands of generations, the giraffe, as species, has thus evolved to display its characteristically long neck.<sup>190</sup> Meanwhile, other iterations of evolutionary theory, such as that promulgated by Robert Chambers in the 1844 book *Vestiges of Creation*, which was itself a highly popular book in Victorian England, articulated the natural laws by which the universe, the Earth, and life had developed as the intricate work of God directing nature.<sup>191</sup>

Thus, when Charles Darwin's theory first caught the attention of Anglo-American biologists, it did not command the spotlight alone, even as it quickly rose to command the greatest portion of it. Darwin first began work on evolutionary theory in an 1835 voyage to the Galapagos Islands, itself now as much the stuff of legends as the Scopes Trial. In *The Voyage on the Beagle*, the work documenting that voyage, Darwin reports many of the observations that he would later develop into his own theory of evolution, one that relied on a mechanism he would call "natural selection." In 1859, prompted by the news that Alfred Russell Wallace, a competing naturalist, had prepared a theory similar to his own, Darwin finally developed his observations into a complete scientific thesis, building on LaMarck's earlier ideas. Although LaMarckian evolution possesses no currency in contemporary biology, its influence on Darwin's thinking was such that Darwin himself acknowledged LaMarck in the preface to the sixth edition of *The Origin of Species*, noting that "he [LaMarck] first did the eminent service of arousing the probability of all change in the organic, as well as the inorganic world, being the result of law

---

<sup>190</sup> Peter Bowler, *Monkey Trials and Gorilla Sermons: Evolution and Christianity from Darwin to Intelligent Design* (Cambridge: Harvard University Press, 2009), 62 – 63; 142 – 143. This book as a whole offers an especially useful discussion of religious syntheses of evolution and goes a long way toward also dispelling the frequent conflation of religion in general with Christianity, specifically Fundamentalist Christianity, within discussions of science and religion.

<sup>191</sup> *Ibid.*, 71 – 76.

and not of miraculous interposition.”<sup>192</sup> Despite Darwin’s debts to earlier thinkers, the publication of *The Origin of Species* on Thursday, November 24<sup>th</sup>, 1859 marked the beginning of a shift in human thought as seismic and consequential as that begun by Copernicus just over four hundred years earlier.

### **Articulating the Conflict Thesis in the Mid-19<sup>th</sup> Century**

The mechanism of evolution, the key respect in which Darwin’s theory differed from LaMarck’s made all the difference for Darwin’s immediate reception. Had Darwin proposed a theory of evolution more like LaMarck’s, perhaps his thesis would not have generated such immediate and intense controversy in England and the United States. Darwin’s proposal of the common ancestry of *all species* and *natural selection* as the mechanism by which one species evolves into another criticism—the principle way in Darwin distinguished his theory from that of LaMarck—entailed, as Oliver Rieppel has described the consequence of these proposals, “science free of design and purpose, a science where certainty was replaced by probability.”<sup>193</sup> Unsurprisingly, criticism of evolution as atheistic followed almost as soon as *The Origin* had been published. In other words, the conflict thesis had been born.

The conflict thesis would generate its first skirmish not even a year after *The Origin*’s publication. On June 30<sup>th</sup>, 1860, partisans embracing Darwinian evolution gathered in Oxford with opponents of Darwin’s theory for a meeting now known as the “Wilberforce-Huxley Debate.” Here, Thomas Henry Huxley, who on account of this debate acquired the moniker

---

<sup>192</sup> Charles Darwin, *The Origin of Species by Means of Natural Selection, Or, The Preservation of Favoured Races in the Struggle for Life*. 6th Ed., with Additions and Corrections. (Eleventh Thousand). ed. Library of English Literature ; LEL 13272. (London: John Murray, 1872), xxii.

<sup>193</sup> See Oliver Rieppel, *Evolutionary Theory and the Creation Controversy*, (London: Springer, 2011), 80. This monograph attempts to trace some of the basic intellectual disagreements between evolutionists and creationists to more basic disagreements in classical, medieval, Renaissance, and Early Modern philosophy. It provides a very good sketch of the metaphysical and epistemology issues at stake in the debate.

“Darwin’s Bulldog,” engaged in a memorably caustic dispute with Bishop Samuel Wilberforce, one of the most famous preachers of the 19th century and early reviewer of *The Origin of Species*. Like The Scopes Trial, which features Clarence Darrow’s famous cross-examination of William Jennings Bryan, The Wilberforce-Huxley Debate symbolizes and almost seems to prefigure the view that a necessary conflict exists between the propositions of science and religion. In one exchange, for instance, Wilberforce allegedly asked Huxley whether his simian ancestors fell upon his grandmother’s or his grandfather’s side of his family tree. To this, Huxley replied that he would rather share ancestry with an ape than with a man like Wilberforce.<sup>194</sup>

Despite such amusing anecdotes proving more than capable of sustaining the conflict thesis, historians of science have noted that accounts of this debate, much like the purported conflict between science and religion itself, have been notoriously prone to exaggeration. In all actuality, the crowd assembled in the Oxford Natural History Museum had grown so loud at the moment of the climactic exchange that “it is indeed impossible to know exactly what went on...that summer day.”<sup>195</sup> Nevertheless, the debate was immediately seized upon as a salient metaphor for the perceived conflict between science and religion, a conflict represented by the dispute between supporters of creationism and supporters of evolution. Indeed, in the wake of The Scopes Trial, a non-academic periodical titled *Evolution* featured a photograph of a monkey referred to as the editor’s “great great great great...grandfather.”<sup>196</sup> The facts of this debate notwithstanding, though, no one can doubt its rhetorical efficacy of the Wilberforce-Huxley Debate as a point of

---

<sup>194</sup> Lynn Phelps and Edwin Cohen, “The Wilberforce-Huxley Debate” in *Western Speech* 37, no. 1 (1973): 56 – 64.

<sup>195</sup> David Livingstone, “Myth 17: That Huxley Defeated Wilberforce in Their Debate Over Evolution and Religion” in Ronald Numbers, *Galileo Goes to Jail and Other Myths about Science and Religion*, (Cambridge, Massachusetts: Harvard University Press, 2009), 155.

<sup>196</sup> Unknown author. *Evolution: A Journal of Nature* 1, no. 1, 1927, 16.

reference for those persons – religious or secular – seeking to construe Darwinian evolution as a necessary and inherent challenge to religious faith.

Despite even the protests of such scientific luminaries as Gray, whom Darwin later referred to as the best American interpreter of his work, the conflict thesis, from its inception, swept aside its rivals as swiftly as it assuredly dominates the debate over creation and evolution, science and religion today.<sup>197</sup> As a narrative device, it provides all the historical and cultural antecedents one could want to frame the Scopes Trial, *McLean v. Arkansas*, and *Kitzmiller v. Dover* as simply the more recent episodes in the long and fraught history of a perennial conflict.

Offering a simple and totalizing explanation, the conflict thesis thus quickly and easily found secular and theological proponents alike, nor did it take long for either the popular or the academic press to take it up. Just as notes of condemnation and support of Darwin resounded throughout British and American newspapers, some including caricatures depicting Darwin himself with ape-like features, most accounts of evolution, whatever their position, “repeated, reflected, and perpetuated teleological views of evolution”<sup>198</sup> that diverged from the non-linear, non-teleological view of evolution advanced by Darwin. At the same time, academics began to publish book-length accounts of the conflict between science and religion, even as scholars and textbook publishers in Britain and America began to grapple with how to incorporate or, in some cases, ignore, Darwinian evolution in their curricula.<sup>199</sup> Similarly, many British and American Protestants began publishing books to counter the perceived threat to Christianity posed by Darwinian evolution. Presbyterian theologian Charles Hodge, noted for his earlier defense of

---

<sup>197</sup> Although I deploy the common way of framing the debate, I do not fail to recognize the limits of the dichotomy either. I intend to discuss the limits of this frame both at the end of each case study and in the concluding chapter of the present work.

<sup>198</sup> Constance Areson Clark, ““You Are Here”: Missing Links, Chains of Being, and the Language of Cartoons.” *Isis* 100, no. 3 (2009): 571-89.

<sup>199</sup> See Larson, *Trial and Error*, 7 – 27 for a detailed discussion of the early impact of Darwinism on the American education system.

slavery during the American Civil War, declared in his 1874 book *What is Darwinism* that “we cannot see how the theory of evolution can be reconciled with the declarations of Scriptures.”<sup>200</sup> Hodge was himself a member of Princeton Theological Seminary, which by the 1870s had become the leading seminary in the Presbyterian Church. The so-called “Princeton Theology,” which had developed throughout the 19<sup>th</sup> century, was one of the leading articulators of biblical literalism, about which more will be said later.<sup>201</sup> It was this position toward Biblical interpretation that Hodge believed incapable of reconciliation with Darwinian evolution.

Unsurprisingly, the first book-length account of the “conflict” between the two modes of thinking written from a scientific perspective, John William Draper’s *History of the Conflict Between Science and Religion*, appeared the very next year. Draper had been present at the Wilberforce-Huxley Debate, and his account provided the standard model upon which contemporary popular and academic accounts of the conflict thesis are based.<sup>202</sup> Tracing the origins of contemporary science to the Greeks, Draper, who had himself read a paper during the conference that hosted the Wilberforce-Huxley debate, blamed the ascent of Christianity, particularly Roman Catholicism, for the decline of scientific thinking throughout the millennia that preceded him. This book, which includes such familiar episodes as the jailing of Galileo and the burning at the stake of Giordano Bruno, provided the model for subsequent accounts of a conflict that many now see as inevitable and intractable. Even so, the most prominent of such books, Andrew Dickson White’s *A History of the Warfare of Science with Theology in Christendom* did not appear for nearly twenty more years. This volume, composed with just as

---

<sup>200</sup> Charles Hodge, *What is Darwinism?* (New York: Scribner, Armstrong, and Company, 1874), 141.

<sup>201</sup> See Ernest Sandeen, *The Roots of Fundamentalism: British and American Millenarianism, 1800 – 1930*, (Chicago, London: University of Chicago Press, 2008), 103 – 131 for a discussion of The Princeton Theology’s intellectual roots and its particular relations to debates over pre-millennial and post-millennial stances toward eschatology.

<sup>202</sup> John Hedley Brooke, *Science and Religion: Some Historical Perspectives* (Cambridge: Cambridge University Press, 2014), 45-46. This entire book contains an excellent discussion of the way in which science and religion have overlapped throughout history. It is especially useful for understanding the relatively recent origin of the conflict thesis as a popular and scholarly phenomenon.

much partisan fervor against Christianity as Hodge's volume deployed against Darwinism, declared in no uncertain terms that "modern science in general has acted powerfully to dissolve away the theories and dogmas of the older theologic interpretation...and very powerful in this reconstruction have been the evolution doctrines which have grown out of the thought of men like Darwin and [Herbert] Spencer."<sup>203</sup> This book, which Clarence Darrow, Scopes's lead defense attorney, later cited as formative in his thinking, ultimately provided the standard model of the conflict thesis throughout the 20<sup>th</sup> century.<sup>204</sup> While a diversity of views did indeed exist in the years immediately following publication of *The Origin* and that of Darwin's later book, *The Descent of Man*, the conflict thesis ascended almost immediately and has remained dominant ever since. This thesis, which frames most popular and academic literature discussing the role of evolution in American public schools even today, has remained as scratch resistant as teflon despite the near-continuous criticism of secular and theological interlocutors alike.

By the time of the Scopes Trial – nearly seventy years after Darwin had published *The Origin* – the conflict thesis had become so firmly entrenched in both the academic and popular imaginations of British and American scientists, preachers, and attorneys that firm public relations campaigns for both sides of the dispute had been taking place for years, especially in The United States. Just as a full-blown campaign to defeat evolution's place in public schools had materialized throughout the Southern and Western states, so too had an equally enthusiastic campaign to defend evolution had been taken up throughout the northern states, a geographical

---

<sup>203</sup> Andrew Dickson White, *A History of the Warfare of Science with Theology, Volume II*, (New York: Dover Publications, 1960), 394.

<sup>204</sup> Edward Larson, *Summer for The Gods: The Scopes Trial and America's Continuing Debate Over Science and Religion*, (New York: Basic Books, 2006), 22.

division that seems somewhat too neatly to mirror other geographically based ideological divisions of the time.<sup>205</sup>

### **Fundamentalism and The Conflict Thesis**

As the 20<sup>th</sup> century approached, Fundamentalists, a subgroup of Evangelical Christians, quickly emerged as the most vocal religious proponents of the conflict thesis. Fundamentalist Protestantism, more frequently known simply as “fundamentalism,” can be conceptualized as a subtype of the broader historical and contemporary movements within Christianity known today as “evangelicalism.” Distinct from the Lutheran, Calvinist, and other creeds that inform the mainline Protestant denominations in the United States, Evangelical Christianity can be traced to The First Great Awakening, a religious movement revival fueled by popular (and frequently populist) preachers that gripped colonial America throughout the 1730s and 1740s. Idealistic and confrontational in their rhetoric, Evangelical Christians sought to separate themselves from more established Christian denominations in four ways, including “a climactic and crisislike rebirth experience...their effort to cultivate affectionate and Spirit-filled forms of worship...their strong commitment to spreading the gospel and saving souls both at home and abroad...[and] their demand for a very austere and nonworldly moral stance.”<sup>206</sup> Throughout the First and later the Second Great Awakening, Evangelicals enjoyed great success among a people primed by the Revolutionary War for a religion that prioritized individual experience and one’s personal relationship with God.

---

<sup>205</sup> Such as those regarding racial equality, women’s right to vote, or, perhaps most tellingly, Prohibition. Many also blamed evolution for World War I. Several sources document in detail the legislative efforts to outlaw teaching evolution that took place in the years between the signing of The Treaty of Paris in 1919 and The Scopes Trial in 1925.

<sup>206</sup> Paul Conkin, *When All the Gods Trembled: Darwinism, Scopes, and American Intellectuals*, (Oxford: Rowman and Littlefield, 1998), 51 – 52.

Throughout the 18<sup>th</sup> and 19<sup>th</sup> centuries, such attitudes toward religious thought and practice, far more than any particular stance toward science or biology distinguished Evangelical Christianity from its religious antecedents. The growth of Evangelical denominations such as the Baptists and Methodists, who “responded to the Enlightenment by turning away from reason toward faith and emotion,” continued unabated throughout the 19<sup>th</sup> century.<sup>207</sup> Indeed, Ruse notes, Evangelical denominations were so numerous that “by 1860”—just one year after the publication of *The Origin of Species* and one year before the start of the Civil War—“about a third of the nation’s citizens were actively connected with church, nearly all of which were Protestant and 85 percent of which were Evangelical.” Significantly, Evangelicals experienced the greatest success in the South, Midwest, and the far West—places far removed from the more established religious center of the United States.<sup>208</sup> While Lincoln’s election and the Civil War would delay the coming rupture in American Evangelicalism, however, by the time Grant and Lee met at Appomattox Courthouse, the first shots of a new conflict were nearly ready to be fired.

The group of Evangelicals now called “Fundamentalists” began to separate themselves from their more general milieu after the Civil War, when American intellectuals began to grapple seriously both with Darwin’s ideas and with new methods of Biblical scholarship that seemed to cast doubt on literal interpretations of The Bible. Despite, and perhaps because of, the numerous denominations represented among the American public, most Americans generally imagined themselves to occupy a nominally “Christian nation” so that Americans functioned, analogous to the Israelites in the Bible, as “God’s chosen people.”<sup>209</sup> Among the Christian intelligentsia, the

---

<sup>207</sup> Ruse, *The Evolution-Creation Struggle*, 148.

<sup>208</sup> Ibid.

<sup>209</sup> Ibid, 149.

empiricism of Francis Bacon and the “common sense” philosophy of Thomas Reid prevailed. In the form iterated by evangelicals, it emphasized the capacity of the ordinary individual’s unaided senses and intellectual abilities to comprehend not only scientific truths, but also Biblical truths. Imagining themselves the intellectual heirs of Francis Bacon, proponents of this position relegated science to the mere collection and categorization of facts equally observable to all individuals. The Bible, meanwhile, required no special training to understand, and could be understood just as well by a layman as a cleric.<sup>210</sup> In other words, while science might be a realm in which an individual could attain definite albeit limited expertise (and the consequent intellectual deference of others), no one could claim such expertise where the Bible was concerned. As a result, no one speaking of matters of theology could demand the same kind of deference to opinion that a scientist speaking within the purview of his field might demand.

An emerging group of Biblical scholars, however, had begun to articulate theological positions that required just the kind of expertise – and deference – that proponents of Common Sense Philosophy rejected. Just as biologists such as Asa Gray had seen in Darwinian evolution an opportunity to observe the mechanisms of God’s work in action, so too did these thinkers. Taking an approach to Biblical criticism that incorporated newly developed techniques of textual criticism, the “Modernists,” as they came to be called, discovered, among other things, that the creation accounts offered in the book of Genesis, which had long been acknowledged to offer two distinct but not necessarily contradictory versions, could be understood as the work of more than one author working from different scrolls. At the same time, archaeological discoveries of other ancient creation accounts, such as those of the Babylonians, revealed similarities between

---

<sup>210</sup> George Marsden, *Fundamentalism and American Culture: The Shaping of Twentieth Century Evangelicalism, 1870 – 1925*, (New York: Oxford University Press, 2006), 111 – 113.

the cosmogony of the Hebrews and that of other cultures.<sup>211</sup> These positions, though far from the dominant religious feeling of the United States in the in late 19th century, had, however, eager proponents who “scorned literalist readings...[and] took seriously the findings of higher criticism.”<sup>212</sup> Even as the conflict thesis found its advocates in one group of Christians, then, it found opponents in another.

Combined, the discoveries associated with Modernism seriously undermined the intellectual case for many of the positions, such as Bishop Usher’s traditional chronology, positions which relied upon assuming both inerrancy of the Bible and a literal interpretation of it. Literalism, which had first been advocated in the early Reformation as a means of aiding in the “disenchantment of nature” in opposition to Catholic superstitions obstructing the advances of the natural sciences, were by the late 19<sup>th</sup> century somewhat ironically being used to—at least according to proponents of the conflict thesis—perform that very same act of obstruction.<sup>213</sup> These stances, key tenets of the still nascent Fundamentalism, nevertheless found eager advocates. Though inextricably entwined in Fundamentalist theology, inerrancy and literalism can be understood as responses to separate questions. Inerrancy entails positing that The Bible, however interpreted, is the true and inspired word of God. Literalism, on the other hand, involves arguing that except in cases of clear allegory or metaphor, The Bible must be interpreted as literally as possible. Indeed, as the Presbyterian postulators of the Princeton Theology argued that, in composing The Bible, “God has placed his words in the writers’ mouths” so that The Bible must be interpreted, using the faculty of “common sense,” analogously to any other

---

<sup>211</sup> A detailed discussion of the discoveries of late 19<sup>th</sup> century Biblical scholarship and a comparison of the creation account of Genesis to that of other ancient cultures can be found in Moore, 20 – 53.

<sup>212</sup> Ruse, *The Evolution-Creation Struggle*, 142.

<sup>213</sup> Brooke, 95. See also 96 – 108 of the same for a discussion of the role of Biblical interpretation, particularly that performed by early forms of literalism, in both the Reformation and the Scientific Revolution.

conversation.<sup>214</sup> At the same time, the same proponents of literalism argued that “the Scriptures taught their own inerrancy.”<sup>215</sup> As Sandeen puts it, “the heart of their position was the argument that God would not, could not, convey truth through an errant document.”<sup>216</sup> Consequently, The Bible not only may be interpreted word-for-word, as a document analogous in reliability to a historical record or a discovery of natural science, it must be interpreted as such.

Some theologians, like their counterparts in the sciences, sought to reconcile their religious ideas with the evidence and explanations offered by these new approaches to science and scripture. Others, however, immediately grouped Darwinian evolution and historical-textual approaches to the Bible as threats to doctrinal orthodoxy and social stability.<sup>217</sup> Reacting to these twin threats, Fundamentalist doctrine, discourse, and engagement with the world became marked by three features. In doctrine, Fundamentalists expounded “a very strong emphasis on the inerrancy of the Bible” in addition to “a strong hostility to modern theology and to the methods, results, and implications of modern critical study of the Bible” and “an assurance that all who do not share their religious viewpoint are not really ‘true Christians’ at all.”<sup>218</sup> At the same time, and with little compunction about the compatibility of means and ends, early Fundamentalists eagerly applied the corporate marketing techniques developing alongside The United States’s emerging consumer culture to the work of saving souls. Institutions such as The Moody Bible Institute, founded in Chicago amidst the 1870s response to Darwinism and Modernism, and The Bible Institute of Los Angeles (BIOLA) discovered audiences eager to hear their message. While journalists of the 1920s would later use the Scopes Trial as a means to portray Fundamentalism

---

<sup>214</sup> Sandeen, 124.

<sup>215</sup> Ibid, 125.

<sup>216</sup> Ibid, 130.

<sup>217</sup> Marsden, 11 – 18.

<sup>218</sup> See James Barr, *Fundamentalism*, (London: SCM Press, 1981), 1.

as the religious ideology of the poor, the rural, and the uneducated, in its inception Fundamentalism sought to appeal to the urban, middle-class business-minded Christian with a practical interest in the business of saving souls.

Official denominations, primarily Baptists and Presbyterians, meanwhile purged modernists from their ranks and adopted official statements of essential doctrines. In 1910, for example, The Presbyterian General Assembly adopted a five-point statement of such doctrines, which included “the inerrancy of Scripture...the Virgin Birth of Christ...his substitutionary atonement...his bodily resurrection...[and] the authenticity of miracles.”<sup>219</sup> Consequently, we can see how the conflict thesis provided Fundamentalists with a means of rhetorically dividing themselves not only from the broader secular society of the United States but also from the perceived “liberalization” of other denominations.

Despite the efforts of scientists and theologians alike to promote “theistic evolution” as a means of reconciling the perceived conflict between Darwinian evolutionary theory and Christian belief, then, the conflict thesis found some of its most prominent religious proponents in Fundamentalists. Throughout the 1910s, they coordinated a two-pronged attack on Darwinian evolution, which was often simultaneously conflated with rationalism and modernist higher criticism.<sup>220</sup> These attacks, sponsored by the administrators of The Moody Bible Institute working in conjunction with oil magnate Lyman Stewart, were published between 1910 and 1915 in a series of essays later gathered into an iconic volume now known as *The Fundamentals*.<sup>221</sup> The essays in this collection not only lambasted the purportedly “bad science”

---

<sup>219</sup> Marsden, 117.

<sup>220</sup> Furniss, 52.

<sup>221</sup> See Timothy Gloege, *Guaranteed Pure: The Moody Bible Institute, Business, and the Making of Modern Evangelicalism* (Chapel Hill: University of North Carolina Press, 2015), 8 – 9 and also 90 – 137 for a discussion of the relationship between evangelical Christianity – Fundamentalism in particular – and big business in the late 19<sup>th</sup> and early 20<sup>th</sup> centuries.

underlying Darwin's theory but also on its apparent challenge to fundamentalist doctrines and interpretations of the Bible, a challenge that resulted in inevitable theological confusion and social decline. By the time of the Scopes Trial, Fundamentalists had developed such theses as "flood geology," the "day-age theory," and the "gap theory," all of which were claimed by proponents to offer alternative *scientific* explanations for the phenomena explained by Lyell's geology and Darwin's theory of evolution. At the same time, they pointed to the detrimental doctrinal and social consequences supposedly wrought by evolution, pointing to theological modernism, unbelief among the youth, and, most dramatically, World War I's devastating consequences for Europe.

### **The Rhetorical Stance of Fundamentalists**

Of particular interest to a study of expertise, fundamentalists positioned themselves, in both prongs of their attack, as speaking for the silent majority of Bible-believing Americans, who felt at once appalled and threatened by what was typically presented as the forced indoctrination of children by a narrow elite of self-styled experts against the will of their parents, the taxpayers of the country. Deploying a by-then familiar set of populist tropes, they positioned urban communities against rural communities, state governments against the Federal government and, most significantly, learned skeptics against the unschooled faithful. In marshalling these rhetorical resources, they suggested that, unless swift and drastic action were taken, the evolutionists' assault on the minds of America's youths would inevitably lead to the ruin of their souls. As Baptist minister and staunch evolution opponent T.T. Martin, who would later preach daily sermons against evolution on the streets of Dayton, Tennessee during the Scopes Trial, exhorted the parents of America in his 1923 book *Hell and the High Schools*, the faith of the nation's children was being slowly but efficiently eroded because parents, "brow-beaten by these

Evolutionist high-brows and their pussy-footing apologists and defenders, are standing silently by while our children are being eternally damned.”<sup>222</sup> To these opponents of evolution, the very existence of The United States seemed to be threatened.

Those Fundamentalists advancing the “scientific” prong of the Fundamentalist position focused on attacking the scientific status of Darwinian evolution and on developing alternative theories of the same phenomena supposedly explained by Darwin’s ideas. Attacking the scientific status of evolution, Fundamentalists asserted that, because Darwinian evolution speculated upon the origins of man and other species, it could not be considered a properly scientific theory. This position had the benefit of at least echoing a critique made by some of Darwin’s earliest critics, such as the biologist Louis Agassiz, one of the most famous biologists of the 19<sup>th</sup> century. Even though Agassiz had opposed Darwin’s ideas on scientific grounds in the earliest negative reviews of the *The Origin of Species* and had maintained this opposition throughout his life, however, he could not then nor now be considered a creationist in the sense in which Fundamentalists used the term.<sup>223</sup> Whereas even Darwin’s most vociferous critics from among establishment scientists postulated the epistemic independence of science from theology, Fundamentalists sought to retain the pre-Enlightenment subordination of science to theology.

In advancing this position, its proponents likewise retained the concept of science – in which disinterested observers simply gathered and classified data – that governed much work at the beginning of the 19<sup>th</sup> century. Because no proponent of Darwinian evolution had ever observed one species transforming into another, fundamentalists argued that Darwin and his

---

<sup>222</sup> T.T. Martin *Hell and the High Schools: Christ or Evolution, Which?* (Kansas City: Western Baptist Publishing Company, 1923): 165.

<sup>223</sup> See Numbers, *The Creationists*, 16-20 for a discussion of how the scientific criticism of Darwin, often focused on his proposed mechanism of natural selection, differed from the kinds of purportedly scientific criticisms that would later be launched by American Fundamentalists.

supporters had gone beyond this strict boundary. Whatever else they claimed about the truth of Darwinian evolution, it could by no means even be considered a scientific position.

Developing such theses as “flood geology,” “the day-age theory,” and “the gap theory,” Fundamentalists added a second barb to the scientific prong of their attack by propounding alternatives to the age of the Earth suggested by contemporary geology. These three terms, which refer to various theological positions about the age of the Earth, are especially important to understanding not only Fundamentalist discourse but also the discourse of creation scientists and intelligent design theorists. While Fundamentalists might have viewed Darwinian evolution as a threat to the very existence of Christian America, the immense 19<sup>th</sup> century advances in science, more particularly the material benefits it yielded to Americans’ lifestyles, forced them to proffer “scientific” alternatives to Darwinian evolution.<sup>224</sup> Consequently, Fundamentalists began by isolating what they perceived to be the purely scientific weaknesses of Darwinian evolution. Writing in *The Fundamentals*, George Frederick Wright, a pastor and professor who had also been a one-time devotee of Asa Gray’s Christian Darwinism, contended that Darwinian evolution simultaneously required that the earth be much older than even Darwin believed it to be and that evolution could not have occurred because the probability of any one variation co-occurring with other variations supposed to be necessary for the first to be advantageous seemed extremely small.<sup>225</sup> For humanity to have evolved, Wright claimed, “all these peculiarities in the body and mind of man... must have taken place simultaneously and at the same time have been in considerable amount,” but “such chance combinations are beyond all possibility of rational

---

<sup>224</sup> George Webb, *The Evolution Controversy in America*, (Lexington: University Press of Kentucky, 1994), 64.

<sup>225</sup> See Numbers, *The Creationists*, 35-37 for a discussion of Wright’s involvement with Gray. This discussion appears as part of a larger chapter devoted to Wright’s conversion from Christian Darwinism to Fundamentalism. In addition to being a theologian, Wright had tried his hand at geology, even publishing his own analysis of glaciers. Numbers’s treatment of Wright’s life and work is useful because it shows that one and the same person might espouse very different positions throughout their lifetime and might, as Wright’s case shows, even saddle the boundaries between positions thought to be in conflict.

belief.”<sup>226</sup> Although these purely negative attacks on evolution might be enough to satisfy those already converted, however, winning new converts would require propounding some alternatives.

Flood geology, the day-age theory, and the gap theory offered three such alternatives. Significantly, no orthodoxy among these positions was enforced by Fundamentalist organizations like the WCFA. Consequently, Fundamentalists could publicly maintain unified opposition to evolution while retaining some “big tent” appeal with respect to the details of that opposition. Flood geology was developed by Seventh-Day Adventist George McCready Price, a self-trained geologist, in works such as *Illogical Geology: The Weakest Point in the Evolution Theory* and *The New Geology*. In these works, Price contended that the Noachian flood explained numerous phenomena, such as the presence and location of fossils in the various strata of the Earth or the different races to be found among humans.<sup>227</sup> Though immediately and completely rejected by professional geologists, flood geology appeared to fundamentalists to offer them a solid intellectual foundation on which to stand. And, while it may not have been the most prominently held position among Fundamentalists at the time of The Scopes Trial, the “creation science” movement that attracted national attention with its activism and litigation throughout the 1960’s, 70’s, and 80’s would take flood geology as their starting point.

In the 1920s, however, most Fundamentalists subscribed to either the day-age theory or the gap theory. As was the case with flood geology, these positions allowed Fundamentalists to articulate the alternatives to evolution that they would need to assert throughout the increasingly large number of public debates that they held with scientists throughout the decade. According to

---

<sup>226</sup> George Frederick Wright, “The Passing of Evolution” in *The Fundamentals: The Famous Sourcebook of Foundational Biblical Truths*, (Grand Rapids: Kregel Publications, 1990), 623.

<sup>227</sup> Webb, 65; Ruse, *The Evolution-Creation Struggle*, 241.

the day-age theory, the supposed conflict between science and the cosmogony narrated in Genesis might be resolved by interpreting the days of Genesis not as twenty-four-hour diurnal days, but as ages or eras of creation, each of which lasted for a period of time unknowable – and probably incomprehensible – to human intelligence. As James Orr, a Scottish professor of apologetics at United Presbyterian Theological College argued of the day-age theory, “there is no violence done to the narrative in substituting in thought ‘aeonic’ days – vast cosmic periods – for ‘days’ on our narrower, sun-measured scale.”<sup>228</sup> It was the day-age theory that William Jennings Bryan would later advocate when testifying as an “expert on the Bible” during the Scopes Trial.<sup>229</sup>

The gap theory, meanwhile, suggested that “there is a long period of time between the events in the first and second verses of Genesis 1.”<sup>230</sup> In other words, the universe itself may have been created a very long time ago, but the special creation of man is a relatively recently event. This position, since it allowed Fundamentalists to explain away the large numbers of years required to account for geological phenomena while maintaining the divine creation of man, proved especially durable. The scientific flaws of Darwinian evolution having been exposed and challenges to its dominance having been thus bolstered, Fundamentalists felt free to focus on the second prong of their attack.

Fundamentalists complemented their scientific criticism of Darwinism with a second prong of attack based on criticism of the deleterious effects that belief in Darwinian evolution had wrought on the faith and morals of Americans. Throughout the early 1910s and early 1920’s, fundamentalists in Kentucky, Oklahoma, Arkansas, and Tennessee began to blame Darwinian

---

<sup>228</sup> James Orr, “Science and Christian Faith” in *The Fundamentals: The Famous Sourcebook of Foundational Biblical Truths*.

<sup>229</sup> Ruse, 238.

<sup>230</sup> Bowler, 204 – 205.

evolution for, among other things, a rise in crime, sexual permissiveness, and – though this might seem trivial to 21<sup>st</sup> century Americans – atheism. Most dramatically, they blamed evolution for causing World War I, a task with which they were assisted by some within the scientific community. Vernon Kellogg, a Stanford biologist who had gone from being a conscientious objector to a fervent supporter of the war effort, fiercely denounced evolution in *Headquarters Nights*, a serial originally published in 1917 in the *Atlantic Monthly* and purporting to be reports of Kellogg's conversations with German officers while stationed abroad. The Germans, Kellogg contended, believed that evolution proceeded according to “a natural selection based on violent and fatal struggle,” a struggle by which “natural law may work out in its cruel, inevitable way the salvation of the human species.”<sup>231</sup> Indeed, evolution's perceived conflict with what Fundamentalists believed to be sound Biblical morality might have motivated them even more than the apparently faulty premises in geology and biology that it assumed.

The activist energies of Fundamentalists finally took material form with the 1919 founding of The World's Christian Fundamentals Association (WCFA). The WCFA's role in spreading not only the general principles of fundamentalism but also the particular campaign against evolution cannot be understated. After beginning by galvanizing and then uniting various denominations around antievolutionism, WCFA leaders such as William Bell Reilly, A.C. Dixon, and J. Frank Norris began a concerted social campaign against evolution. Bolstered by popular evangelists such as Billy Sunday, these self-styled campaigners for the soul of America targeted colleges by challenging professors to debates that tended to turn into show trials and by publicly haranguing college presidents in the popular press and private pamphlets. In doing so,

---

<sup>231</sup> Vernon Kellogg, “Headquarters Nights: A Record of Conversations and Experiences at the Headquarters of the German Army in France and Belgium” in Christian Young and Mark Largent *Evolutionism and Creationism: A Documentary and Reference Guide*, (Westport, Connecticut: Greenwood Press, 2007), 147 – 148.

The WCFA's leadership repeated all of the strategies that had originated in *The Fundamentals*, variously attacking the scientific veracity of evolution and denouncing its harmful effect on public morality. The campaign against the colleges quickly turned into a campaign within state legislatures, and by the mid 1920s attempts to ban evolution had emerged in Florida, Tennessee, Oklahoma, Mississippi, and Arkansas. While the campaigns in the state legislatures met with more mixed success than those against the colleges, the conceptual, cultural, and political pieces that comprised the Scopes Trial — and the debates about experts and expertise that continue to this day — were now set.<sup>232</sup>

---

<sup>232</sup> See Michael Lienesch, *In The Beginning: Fundamentalism, The Scopes Trial, and The Making of The Antievolution Movement*, (University of North Carolina Press, Chapel Hill: 2007), 34 – 138 for perhaps the most thoroughly researched examination of the WCFA's role in promoting antievolutionism throughout the 1920s.

### Chapter 3

#### The Scopes Trial and The Anti-Expert Stance

Within the murky mythology surrounding the complicated relationship between science and religion in the United States, no episode stands out more prominently in the typical American's mind than *Scopes v. Tennessee*, more commonly known as the Scopes Trial.<sup>233</sup> The Scopes Trial offers a fitting place to begin not only because it now lies so deep in the American collective memory that a simplified, standard narrative of its events is typically taken for granted but also because this trial presents a case in which the legend has so far outgrown the facts that, nearly a hundred years later, distinguishing between the two remains a puzzle. Most importantly, the Scopes Trial offers a way for rhetoricians, linguists, and philosophers to understand how experts on the stand have used modalized expressions to construct their rhetorical and epistemic stances.

In this chapter, I analyze modalized statements in the testimony of geologist Maynard Metcalf, the only scientific expert to testify at the Scopes Trial to develop how the epistemic stance of experts, measured by the frequency and construction of epistemically modalized statements, correlate with broader rhetorical moves. In doing so, I develop the “expert epistemic stance” as a component of the broader rhetorical stance of experts. At the same time, through a similar analysis of the testimony of William Jennings Bryan, who spoke as an “expert” on the Bible (not necessarily theology), I develop a new rhetorical concept: the anti-expert stance. While much has been written about the rhetorical dimensions of expertise, the anti-expert stance has yet to be formally developed. Bryan's testimony offers a useful artifact for such conceptual development both because it is often treated as a synecdoche for the entire Scopes Trial but also

---

<sup>233</sup> Naturally, this assumes that any such events stand out at all.

because Bryan explicitly positioned himself against the formalized knowledge of experts, which, if his statements are taken sincerely, he took to demean the knowledge and experience of everyday Americans.

The anti-expert stance, typified by appeals such as the *ad populum* fallacy, stark dichotomies, and, perhaps most significantly, rejection of the lay-person's *epistemic dependence* on experts, allows a rhetor to counter claims dependent on accepting formalized, institutionalized knowledge by casting doubt on the value of experts and the motives of experts while lionizing the supposedly unvarnished authenticity of the lay-person uncorrupted by excessive specialization. Often a component of populist rhetorical styles, the anti-expert stance should, nevertheless, not be conflated with populist rhetoric *as such*, which might be defined as much by who it advocates for as by the tropes it deploys. Indeed, the anti-expert stance, a portable group of broad argumentative strategies, linguistic styles, and attitudes toward information, can easily be deployed by actors who most would consider far from the nebulous "people" who so often function as the subject of populist rhetoric. Since the Scopes Trial, corporations have been prominent deployers of the anti-expert stance, for instance, casting doubt on doctors' and scientists' claims about the risks of smoking or climate change and encouraging the untutored consumer to simply "make your own decision."<sup>234</sup> At the level of individual statements and modal verbs, the anti-expert stance can be distinguished from the expert stance in that, although far more statements are modalized for necessity than for possibility — in Bryan's testimony there are almost twice as many statements modalized for necessity than for possibility, for instance — the anti-expert is certain less about ideas than about the intellectual virtues of the lay

---

<sup>234</sup> Naomi Oreskes and Erik M. Conway, *Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Climate Change*, Bloomsbury Publishing, 2011, pp. 136-169, although it does not use the terminology or methods of rhetorical analysis, documents many examples of corporations deploying what I am calling here the "anti-expert stance."

person. In other words, although the goal of the anti-expert stance may be to cast doubt on the authority of experts, it accomplishes this goal indirectly, by substituting for the expert's certainty a certain belief in the power of the individual to make up his own mind, no matter the complexity of a question.

As much as I try to distinguish rhetorical and linguistic features of the anti-expert stance from those of the expert stance, though, I also attempt to show how, perhaps as products of courtroom discourse, these epistemic and rhetorical stances share at least some linguistic features. As will be seen later, for instance, both Metcalf and Bryan used “would” to modalize statements for necessity more than they used any other modal verb. So, despite being at cross legal and rhetorical purposes, they are not entirely distinct at the grammatical level. It is also worth noting — though I will not develop this idea more until later chapters — that in their testimony we also see early evidence for the ways in which expert witnesses use of modal verbs deviates from more general usage. “Would,” for example, is used third most frequently of the modals if recent corpus-based frequency dictionaries are to be believed.<sup>235</sup> Put simply, both the expert and the anti-expert — not to mention the counter-expert and the para-expert that I will discuss later — deploy modal verbs in ways that deviate from general usage.

### **The Scopes Trial and the Conflict Thesis**

A brief look at the Scopes Trial's influence on the American history curriculum — itself now the subject of fierce criticism amidst the ongoing uproar over Critical Race Theory — suffices to illustrate the puzzle this case presents. Despite having never been cited in a single

---

<sup>235</sup> For the purposes of this study, I will compare my data to that found in Mark Davies and Dee Gardner, *Frequency Dictionary of Contemporary English*, (Routledge: 2010), 11. Since the data in this book draws from a corpus of English written and spoken text ranging from 1990 to 2008, I will not draw on it much to discuss the Scopes Trial, which happened in 1925. It is worth noting, though, that the trend observable here *does* hold in later chapters, and the most recent trial analyzed in this case falls within the years from which this book's corpus was drawn.

subsequent legal decision, the Scopes Trial is viewed by many Americans and taught in contemporary American history textbooks as both extremely momentous and as practically synonymous with a logically necessary conflict between science and religion. Most significantly, it is portrayed as a primordial embodiment of the conflict thesis. One textbook, published by McGraw-Hill, describes the theory of evolution as having “openly challenged the Biblical story of Creation.”<sup>236</sup> Another, published by Norton, concludes its section on the Scopes Trial by reminding readers that “The Scopes Trial did not end the uncivil war between evolutionists and fundamentalists. It continues to this day.”<sup>237</sup> The conflict thesis, despite being rejected by pretty much all contemporary scholarship, remains perhaps the most typical view of The Scopes Trial and of the general relationship between science and religion found in American society. A 2015 Pew Research Survey on the subject, for example, revealed that, even though most Americans believe that science and their own *personal* religious beliefs do not conflict, 59% of Americans believe that science and religion *in general* “are often in conflict.”<sup>238</sup> This view, perhaps unsurprisingly to many, coincides with the smaller share of Americans who either reject the theory of evolution altogether or subscribe to some version of “young-earth” creationism, a term for a cluster of views connected by the common thesis that the earth and the species that inhabit it were created more-or-less in their present form at some point within the last six to ten thousand years. The ranks of Americans subscribing to some version of this thesis has held constant at about a third of the American public, with states such as Texas boasting a small majority of citizens adhering to such views as recently as 2010.<sup>239</sup>

---

<sup>236</sup> See Brinkley, 558 for an example of how history textbooks currently used in American classrooms use this case to frame religion and science in conflict with each other.

<sup>237</sup> George Brown Tindall and David Emory Shi, *America: A Narrative History*, (New York: Norton, 2013), 1031

<sup>238</sup> Pew Research Center, “Religion and Science,” October 22 2015, [https://www.pewresearch.org/internet/wp-content/uploads/sites/9/2015/10/PI\\_2015-10-22\\_religion-and-science\\_FINAL.pdf](https://www.pewresearch.org/internet/wp-content/uploads/sites/9/2015/10/PI_2015-10-22_religion-and-science_FINAL.pdf).

<sup>239</sup> David Prindle and Tse-min Lin, “Evolution and Public Opinion,” in David Prindle, *The Politics of Evolution*, (New York and London: Routledge, 2015), 90-91.

This view is not new. As one early scholar of not The Scopes Trial observed, a “basic antagonism” exists between “the old faith” and “the new knowledge.”<sup>240</sup> The terms of the conflict, however, are anything but clear. Depending on whom one asks, the term “science” is variously associated with the benefits of enlightenment, progress, and tolerance or the menaces of atheism, elitism, and technocracy. Religion, meanwhile, tends to be clustered alternatively with the positive qualities of tradition, family, and patriotism or the negative qualities of superstition, repression, and theocracy. Indeed, in the world according to the conflict thesis, pairs of terms such as creation/evolution, God/nature, description/explanation, knowledge/belief, truth/error, and rhetoric/philosophy, exist in dichotomous, almost Manichean tension with one another.<sup>241</sup>

Within a view of American history so construed, the places and persons associated with the Scopes Trial – the tiny Tennessee town of Dayton; three-time Presidential candidate and former Secretary of State William Jennings Bryan; the famous defense attorney Clarence Darrow; and the demure substitute biology teacher, John T. Scopes – take on familiar and predictable roles. The conflict thesis transforms the town into a battleground in which the authority of the community is pitted against the freedom of the individual. William Jennings Bryan becomes either a defender of common people or a bigot taking advantage of those same people’s ignorance. Clarence Darrow becomes a champion of progress or a degrader of public morals. Only the man who lends his name to the case, John T. Scopes, seems to emerge clearly, for whether he is depicted as Galileo standing up to Cardinal Bellarmine or the Pied Piper leading the youth away from home and hearth, no advocate of the conflict thesis disagrees that Scopes himself played the bitterest of bit parts in this cosmic struggle that has been played out

---

<sup>240</sup> Norman Furniss, *The Fundamentalist Controversy*, (Hamden, Connecticut: Archon Books, 1963), 30.

<sup>241</sup> See Kary D. Smout, *The Creation/evolution Controversy: A Battle for Cultural Power*, (Westport, CT: Praeger Publishers, 1998) for a discussion of the way various key terms in this debate have been defined according to the parameters of the conflict thesis.

since Socrates first stood up to the Athenian jury. Similarly, no proponent of the conflict thesis disputes that, no matter how prominent a participant's role, each of the individuals just mentioned in addition to everyone else associated with the trial were merely playing out one of the oldest scripts in history. At the end of the day, according to the conflict thesis, *Tennessee v. Scopes* was always destined to become "The Scopes Trial."

Despite being rejected by most scholars and even by many participants in the trial, this version of the conflict thesis has dominated popular and even some scholarly perceptions of the trial practically from the moment a group of Dayton city boosters conceived of staging a "monkey trial" in order to boost the town's lagging economy. Attempts to reframe or debunk the conflict thesis have been done from the perspectives of various natural and social science fields. Neither have humanists been strangers to the debate. Few studies, however, have been done by rhetoricians. Those that have been done, though, have shed light on critical differences between the "legal" narrative of The Scopes Trial and the "popular" narrative of The Scopes Trial, the diverse terminological frames of constructed within and about the conflict thesis, and the rhetoric of historical figures associated with the case. Other notable studies have debunked the conflict thesis through thick historical analysis of the rise of standardized biology textbooks, the Fundamentalist contribution to the antievolution movement, or – naturally – The Scopes Trial itself. Joining these critiques, this chapter uses the evidence of modal verbs to illustrate how different attitudes toward what counts as knowledge, what subjects one can be an expert in, and how certain one must be to claim to know something lie at the heart of the disputes in The Scopes Trial. Indeed, it shows that viewing this case as representing any kind of necessary conflict between Science and Religion reveals far more about the persons purporting to resolve

or participate in the conflict than it does about the nature of either of the disputed terms, however one construes them.

Whereas the battle in the court room was very much won by the prosecution, which successfully convicted John T. Scopes, the substitute biology teacher who had been charged with violating Tennessee's Butler Act, which forbade the teaching of evolution, the battle in the press was very much won by advocates of the conflict thesis, who portrayed the trial as a monumental struggle between the forces of progressive science and those of traditional superstition. Significantly, the legal narrative of the trial reveals the multitude of positions taken and the way in which some contemporary and most subsequent popular coverage of the trial has relied on extremely simplified, almost cartoonish caricatures of both "sides" of The Scopes Trial.<sup>242</sup>

Although Smout argues that "when described from the viewpoint of rhetoric rather than philosophy, the Scopes Trial can be seen as a contest about word meanings between competing communities rather than an effort by creationists or evolutionists to misuse important terms and obscure the truth," this view does not so much dispel the conflict thesis as sidestep it by recasting it as a linguistic rather than an ideological conflict.<sup>243</sup>

Others, meanwhile, have sought to locate The Scopes Trial within a larger dispute about the role of textbooks in mediating civic and political values. Throughout much of the early 20<sup>th</sup> century, textbook companies such as The ABC Book company maintained a virtual monopoly on the production and distribution of textbooks, which often sought to inculcate the values necessary to adapt to the environments of America's growing cities. Consequently, states often

---

<sup>242</sup> See Lawrence Bernabo and Celeste Condit, "Two Stories of The Scopes Trial: Legal and Journalistic Articulations of the Legitimacy of Science and Religion" in *Popular Trials: Rhetoric, Mass Media, and the Law*, edited by Robert Hariman, Tuscaloosa: University of Alabama Press, 1990, 55 – 85 for an extremely detailed comparison of the trial as it played out "on the ground" compared to how it played out in the press. Of particular note, Bernabo and Condit observe that the narrative created by the press coverage of the trial and subsequent literary portrayals of it have had far more historical and contemporary influence than that of the trial's actual events.

<sup>243</sup> Smout, 46.

adopted textbooks that might not be especially suited the local populace served by particular school district. Although early studies of Fundamentalism contended that “it was apparently ignorance of the meaning of modernism and evolution, ignorance then blanketing much of rural America, that brought about the attack, not antagonism toward cities,” that motivated antievolutionists, more recent work has suggested that active antipathy rather than passive ignorance played a larger role than has previously been acknowledged.<sup>244</sup> One study of the national debate over textbooks as well as that in Tennessee throughout the 1910s, 20s, and 30s notes that “school antievolutionism was part of a larger backlash against the expansion of compulsory education, the use of science to promote certain views of citizenship, and the role of textbook publishers and teaching organizations in standardizing curricula.”<sup>245</sup> The 1914 edition of *Civic Biology* by George Hunter, from which John Scopes supposedly taught evolution (though it is significant to note that Scopes himself could not later remember whether he had actually broached the topic in class), was one of many ABC publications that the state of Tennessee, which had close to the lowest literacy rates in the nation, had adopted in 1919.<sup>246</sup> Shapiro observes that while religious arguments may have been used to justify opposition to evolution, it was the perception that evolution was associated with values inimical to the local community that primarily motivated most people in Tennessee. As he puts it, “The Scopes Trial participants reconstructed the origins of the school antievolution movement to suit their own needs...Religion may have been used to *justify* school antievolutionism, but it was not the primary cause of it.”<sup>247</sup> The framing of the trial as a conflict between science and religion, then,

---

<sup>244</sup> Furniss, 29.

<sup>245</sup> Adam Shapiro, *Trying Biology: The Scopes Trial, Textbooks, and the Antievolution Movement*, (Chicago: University of Chicago Press, 2013), 12.

<sup>246</sup> *Ibid*, 66.

<sup>247</sup> *Ibid*, 86.

can be viewed as a conscious choice on the part of the trial's various participants, not the result of some inevitable conflict between science and religion *as such*.

Pointing to how *Civic Biology* figured into the various arguments made at the trial, Shapiro illustrates how these conscious choices manifested themselves. Although The Butler Act, the antievolution statute Scopes would be convicted of breaking, mentioned only the act of *teaching* evolution, it was the contents of *Civic Biology*, not any particular thing Scopes had said or done, that was used by the prosecution to establish that Scopes had violated the statute. Calling various witnesses to testify to the contents of the book and pointing to diagrams in the book that placed man among the other mammals, the prosecution argued that it was not possible to teach from *Civic Biology* without teaching evolution. Since Scopes had taught from *Civic Biology*, he had therefore taught evolution, violating The Butler Act.<sup>248</sup> But, as Shapiro points out, “though Hunter’s textbook states that man must be *classified* with mammals for reasons of anatomical similarity, man does not appear in *Civic Biology*’s evolutionary tree, nor is he explicitly claimed to have any nonhuman ancestry or relation.”<sup>249</sup> The contemporaneous framing of the misdemeanor case *Tennessee v. Scopes* as the Manichean struggle between science and religion stylized as The Scopes Trial – and the same case’s subsequent historical framing as such – can be recognized as the deliberate rhetorical work of human actors seeking specific, empirical goals rather than some conceptually necessary struggle simply manifesting itself in human events. Put more simply, the central premise of the conflict thesis – that religion and science, inherently contradict each other – must be rejected by anyone familiar with the history of the textbook at the center of The Scopes Trial, at least with respect to this case.

---

<sup>248</sup> Ibid, 95 – 99. These four pages in particular offer a detailed look at the way in which the appeal to the contents of *Civic Biology* functioned as data and warrants in the prosecution’s arguments.

<sup>249</sup> Ibid, 110.

Other objections to the conflict thesis focus less on The Scopes Trial than on the religious movements opposed to fundamentalism. Although historians treating the late 19<sup>th</sup> and early 20<sup>th</sup> century, the 1920s in particular, often focus predominantly on Fundamentalist iterations of Christianity, they frequently neglect or entirely forget the liberal branches of Christianity, derisively referred to by Fundamentalists as “modernists,” who sought to synthesize evolutionary theory with Christianity. Surveying attempts at such syntheses from the days of Darwin to the present, Peter Bowler argues that “a whole range of alternative positions [to the conflict thesis] have been explored, establishing a continuous spectrum of opinion where creationists and extreme Darwinists want us to see only black and white alternatives.”<sup>250</sup> Consequently, Bowler’s discussion of liberal Christianity within the context of the evolution controversies and The Scopes Trial helps to disconnect concepts of religion from the specific versions of Fundamentalism represented by The Butler Act and instantiated in The Scopes Trial.

A final critique of the conflict thesis faults it with the fallacy of hypostatization, by which an abstraction is treated as a concrete entity. By treating the concepts of “science” and “religion” as “entities in themselves,” Brooke argues, the conflict thesis minimalizes the way in which both concepts refer to “complex social activities involving different expressions of human concern, the same individuals often participating in both.”<sup>251</sup>

Other studies have focused on the rhetoric of specific persons reveal the relationship between the debate over creation and evolution and the populist, anti-expert rhetoric discussed in

---

<sup>250</sup> Bowler, 4.

<sup>251</sup> Brooke, 56.

chapter one. In a study of the anti-evolution speeches given by William Jennings Bryan before and during The Scopes Trial, Kristy Maddux observes that, rather than deploy the tropes of religious fundamentalism for which Bryan has earned such a mixed historical reception, Bryan's anti-evolution message might be more properly understood as a function of his populist politics.<sup>252</sup>

In other words, despite little if often vitriolic scholarly support, the conflict thesis features prominently in the narratives presented both to popular audiences and to American students nearly one hundred years after John Scopes was tried, and – perhaps more importantly – had his conviction overturned. Although it has been studied from historical, philosophical, rhetorical, and scientific perspectives, its basic frame remains consistent. Scholars advocating for or against the conflict thesis, whether evaluating arguments, explicating rhetorical themes, or analyzing scientific evidence, all presume that the question is about whether science and religion are in conflict *as concepts* or *as practices*. Moreover, work on the Scopes Trial has particularly featured the famous expert witness testimony of William Jennings Bryan as evidence for or against the conflict thesis, though the fact that the same man's testimony can be used to make either case should raise some eyebrows. Another useful study of Bryan and Darrow's speeches from the trial has shown how each man alternatively construed himself as representing a side that had been victimized by the other. In Bryan's case, the victimized group was the "majority" of the people of Tennessee, but especially parents, whose rights to control the curriculum were being violated by scientists, who, in Bryan's construal of events, constituted a minority seeking to impose its belief in atheistic, materialistic evolution on a faithful–read Christian–majority. Flipping the script, Darrow portrayed the events of the case as analogous to a medieval

---

<sup>252</sup> Kristy Maddux "Fundamentalist Fool or Populist Paragon? William Jennings Bryan and The Campaign Against Evolutionary Theory," *Rhetoric and Public Affairs* 16, no. 3 (2013): 492.

inquisition, in which a bigoted group sought to neutralize a threat to its power by means of Scopes's "inquisitorial" trial.<sup>253</sup> No one, though, has yet thought to ask whether a conflict might exist but, instead, stem from rival views of epistemology, incompatible views of expertise, and, most significantly, distinct uses of epistemic modal verbs. Moreover, the testimony of Dr. Maynard Metcalf, the Oberlin College geologist who was the only scientist to actually testify at the trial before expert testimony was excluded from evidence, has often been relegated to the footnotes of the trial. By analyzing how Metcalf and Bryan alternatively used modal verbs to construct their epistemic stances and, thereby, their rhetorical stances, I argue precisely the view described above: that a conflict does exist, but that it primarily stems from competing notions of expertise. Furthermore, I try to decenter the role that William Jennings Bryan has played in thinking about the trial, both in work published contemporaneously and in scholarship published in the near century since the trial occurred.

### **Immediate Context of The Scopes Trial**

Anti-evolution partisans found their most stalwart champion in perennial politician and recently resigned Secretary of State William Jennings Bryan, who had in, 1896, 1900, and 1908, served as The Democrat Party's nominee for President. Still famous among contemporary rhetoricians for "The Cross of Gold" speech he delivered at the Democrats' National Convention in 1896, Bryan today presents a figure as curious for the rhetorician as for the historian. His capacity to blend populist rhetoric with uncompromising Evangelical Christianity, a rhetorical style that his political opponents decried as socialism, inspires work to this day on account of its skillful mixing of ideological, stylistic, and thematic tropes that many contemporary Americans might regard as mutually exclusive. Bryan, as notable for his opposition to Progressive Era

---

<sup>253</sup> Thomas Lessl, "Punctuation in the Constitution of Public Identities: Primary and Secondary Sequences in the Scopes Trial," *Communication Theory* 3, no. 2 (1993): 99-105.

imperialism and his support for the Women's Suffrage movement as for his opposition to evolution, had, in addition to having been Presidential candidate, served as Woodrow Wilson's Secretary of State until upon the latter's decision to enter The United States into the First World War. After resigning in protest in 1918, Bryan spent the last seven years of his life, which ended a mere five days after The Scopes Trial concluded, to opposing the introduction and continued teaching of Darwinian evolution in American public schools.

Although Bryan's anti-evolution activism reached its apex during The Scopes Trial, by the time the world's eyes turned to Dayton, Tennessee, The Great Commoner had already been campaigning against evolution for twenty years. Like other Fundamentalists, Bryan decried evolution as scientifically impossible, destructive of morals, and corrosive of faith, frequently accusing the German embrace of Darwinian evolution for World War I.<sup>254</sup> At churches and lecture halls across the country, Bryan railed against evolution's capacity to undermine what he presented as the obvious truths of Christianity. At the same time, he saw in the dissemination of evolution through public schools a threat to the autonomy of local governments, which, in the early 20<sup>th</sup> century, exercised significantly more control over the curriculum than they do today. But while Bryan, already a household name in American politics, weaponized his large following among the faithful of the Midwest and South, he appeared to others, especially those in the North, as he always had: a disingenuous politician seeking attention at any cost.<sup>255</sup> Consequently, an opposing movement, equally enthusiastic, had begun to foment in the

---

<sup>254</sup> Moore 2002, pp. 7-8; Larson, *Trial and Error*, 40 – 48.

<sup>255</sup> Andrew Larson, "Bryan, William Jennings (1860–1925)," in *Social and Political Life*, edited by Jeffrey A. Johnson, 22-25. Vol. 1 of *Reforming America: A Thematic Encyclopedia and Document Collection of the Progressive Era*. Santa Barbara, CA: ABC-CLIO, 2017.

Northeast among scientists and lawyers, who alike saw challenges to evolution as a threat to scientific integrity and academic freedom.

These partisans placed their faith in Clarence Darrow, a longtime legal gladiator who, in addition to harboring a desire to contend with Bryan, championed evolution as reason's ascent over superstition and, consequently, evolution over what he would refer to during The Scopes Trial as Bryan's "fool religion." Darrow, a defense attorney with fame and aggression to match Bryan's, was at the time of the Scopes Trial most known for his participation in some of the most controversial American trials to have occurred, including the "Leopold and Loeb Trial" murder trial in which Darrow, speaking for twelve hours, succeeded in avoiding the death sentence for his two clients, two wealthy University of Chicago students who had murdered a fourteen year old teenager after luring him into their car. Like Bryan, Darrow championed the rights of labor, suffrage for women, and the end of imperialism. At first blush, then, Bryan and Darrow might appear to be natural allies. Indeed, Larson notes that, "despite their differences over religion, the two had worked together for a variety of political causes" and, throughout the trial, "the two talked amiably with their hands clasped over each other's shoulders and posed for pictures with the judge."<sup>256</sup> At the same time, Bryan's unbending commitment to fundamentalist Christianity, with its literal interpretation of The King James Bible and its particular insistence on the six-day creation narrative detailed in Genesis, clashed with Darrow's commitment to secular science and experimental methodology. These clashes proved so incommensurable that, although he was about to retire, Darrow postponed his departure from the bar just for the opportunity to tilt against Bryan in court.

---

<sup>256</sup> Larson, *Summer for the Gods*, 150.

The dust from the Huxley-Wilberforce debate having settled in an uneven pattern, the time was ripe to kick it up again. The competing tribes lacked only an arena in which to stage an engagement that, in the eyes of many, had been too long in coming. The southeastern Tennessee town of Dayton, the seat of Rhea County, quickly offered itself up as a colosseum for the conflict thesis to play out. Like several other state legislatures, The Tennessee House of Representatives had begun 1925 by considering legislation designed to prohibit the teaching of evolution in the state's public schools and impose a monetary fine on those convicted of violating it. Despite Bryan's later role in the trial, he had himself had urged the Tennessee legislature to adopt a law more like Florida's 1923 House Concurrent Resolution 7, which outlawed the teaching of Darwinian evolution without prescribing a penalty for violators. Bryan, who had authored some of the language of the Florida bill, recognized the potential for controversy that a monetary or other penalty could create. Nevertheless, the Tennessee State legislature proceeded with its debate. Sponsored by State Representative John Washington Butler, who before entering politics had been not a scientist but a farmer, the bill that became known as "The Butler Act" made it a misdemeanor punishable by a minimum fine of \$100 to teach Darwinian evolution or any theory of human origins that contradicted a literal reading of The King James Bible in biology classes.<sup>257</sup> To use its own words, The Butler Act prohibited anyone "in any of the Universities, Normals, and all other public schools of the State..." from teaching of "any theory that denies the story of the Divine Creation of man as taught in the Bible, and to teach instead that man has descended from a lower order of animals" (The Tennessee Anti-Evolution Act in Ryan 2002, p. 129). Following the bill's quick approval in the State House and with widespread public support, the Tennessee Senate voted the bill into law on March 12, 1925. Without delay, the state's

---

<sup>257</sup> Telling of attitudes in Tennessee at the time, Butler would, during the course of The Scopes Trial, admit to not even knowing of the existence of versions of the Bible other than the 1611 King James Version. See Webb, 86.

governor, Austin Peay, signed the bill, a move that ignited immediate controversy. Newspaper editors across Tennessee, worrying about how the Volunteer State might be perceived by the rest of the country, questioned the governor's judgment.

Local leaders in Dayton, sensing an opportunity to draw publicity to their sleepy hamlet, soon began scouring the ranks of their public high school teachers in search of a man to violate the law. Meanwhile, the American Civil Liberties Union, seeking a test case through which it could appeal such laws as The Butler Act to the Supreme Court, began looking for the same. In an advertisement appearing in *The Chattanooga Times* on May 4, 1925, the ACLU sought "a Tennessee teacher who is willing to accept our services in testing this law in the courts."

Neither side could have hoped for a more suitable defendant than John T. Scopes. The mild-mannered part-time biology teacher and football coach, a new arrival to Dayton, opposed The Butler Act just as sincerely as most biologists did, but was willing to play along with town leaders to coordinate his violation of the law in just such a way as to garner the publicity they sought. Thus, when the ACLU advertised for a teacher willing to challenge the law, evolutionist and anti-evolutionist alike had a friend in Scopes.<sup>258</sup> Also seeing the ad, George W. Rappleyea, an owner of a local mining operation and himself a believer in theistic evolution, saw precisely the chance for publicity that townspeople in Dayton had been looking for. Rappalyea, working with Frank E. Robinson, a local drugstore owner and the chair of the Rhea County School Board, convinced city attorneys Herbert and Sue Hicks to prosecute the case. Henceforth, the comical conspirators staged a dramatic arrest of Scopes in Robinson's drugstore. Rappalyea and Robinson, in keeping with their attention-seeking goal, invited the press, who photographed the event. Thus, the sixth in the still early 20<sup>th</sup> century to be given the moniker "Trial of The

---

<sup>258</sup> Larson, *Summer for the Gods*, 83.

Century” began. Scopes admitted that he had indeed taught Darwinian evolution using George Hunter’s *A Civic Biology*, then the required textbook for the school district. Accordingly, police hauled Scopes off to the county jail, where he immediately posted bond.<sup>259</sup> Darrow, to whom the ACLU objected on account of precisely the publicity he would bring to the case, soon attached himself to Scopes’s defense at the defendant’s insistence; Bryan did the same for the prosecution.<sup>260</sup> For the next several months, the eyes of the world fell upon Dayton with all the curiosity of BF Skinner observing a lab rat. For those outside of Dayton, if not those inside the town, that curiosity would soon find its reward in a trial as notable for its theatrics as for its legal insignificance.

### **Synopsis of the Trial**

From July 10<sup>th</sup> until the somewhat anticlimactic conclusion on July 21<sup>st</sup>, 1925, the trial drew the entire world’s attention. Spectators from the environs of Rhea County joined with journalists from around the world to pack themselves so tightly into the Dayton courthouse, which reached temperatures exceeding a hundred degrees, that special lanes had to be made so that the judge, jury, and litigants could proceed through the crowd. Bryan was joined on the prosecution team by Tom Stewart, district attorney for Tennessee’s eighteenth judicial district. Four other local attorneys, including the brothers Herbert and Sue Hicks, then acting jointly Dayton’s city attorneys, and Wallace Haggard, another young attorney eager to gain a reputation for himself, along with Gordon McKenzie, perhaps the most sincere prosecution supporter of The Butler Act other than Bryan, added to the prosecution team’s ranks. For the defense, Darrow represented Scopes along with Dudley Field Malone, then a well-known divorce lawyer who had

---

<sup>259</sup> Ibid, 86-89.

<sup>260</sup> John Perry and Marvin Olasky, *Monkey Business: The True of the Scopes Trial*, (Nashville: B&H Books, 2005), 26 – 34.

previously worked under Bryan in the State Department and retained some misgivings about his former supervisor. Likewise, The ACLU was represented on the defense team by Arthur Garfield Hays, a New York lawyer with longstanding ties to secular causes. Also joining the defense team was John R. Neal, a law professor who had until recently worked on the faculty of The University of Tennessee.

Although Darrow and the ACLU represented Scopes, they did not actually hope to gain his acquittal. Hoping to appeal the case to The Tennessee Supreme Court and eventually to the Supreme Court of The United States, the defense team instead hoped to use the trial as a vehicle to wage a symbolic battle against religious fundamentalism. The prosecution, with Bryan at the helm, meanwhile, framed the trial as a climactic confrontation between the forces of good and the forces of evil, pitting the local autonomy of rural people rightly determined to inculcate Christian values into their children against the snobbery of urban elites bent on imposing atheism by government fiat. Neither position, of course, fully captures the complicated reality that unfolded throughout the eleven days it took to try, convict, and sentence Scopes. Each position, however, demonstrates the prominence and potency of the conflict thesis, which retains its hegemony in the popular American imagination even today, as the trial's 2025 centennial approaches.

The trial opened with a prayer after Judge John T. Raulston, himself a devout fundamentalist, entered the court room carrying a statute book in one hand and a King James Bible in the other. Owing to an unauthorized meeting of the jury during May, Scopes first had to be indicted again, resulting in proceedings that occupied most of the trial's first morning. After the litigants returned from lunch, jury selection could finally begin. Selecting jurors that Darrow would accept proved challenging, though, as many of the potential jurors, whose names had been

drawn from a hat in lieu of the typical practice of selection by the county sheriff, either professed aggressive fundamentalist religious beliefs or were transparently interested in getting a front-row seat of the trial's proceedings. Consequently, the jury that eventually convicted Scopes contained at least one man who admitted his complete illiteracy and several others who claimed complete ignorance of Darwinian evolution. It was also during jury selection that the question of expert witness testimony, upon which Darrow hoped to base his defense of Scopes, became a major issue in the trial. Indeed, since most of Dayton's citizens were farmers who had little in the way of formal education, Darrow questioned the potential veniremen's competence to understand the testimony of his proffered experts.

Indeed, whether or not expert witness testimony would be admitted proved the most major source of disagreement on the trial's first day. Although the prosecution agreed that expert witnesses might pose a problem, it did so for reasons far different from those offered by the defense. To the prosecution, expert witness testimony was irrelevant to the case because the Butler Act prohibited outright the teaching of evolution. Consequently, any attempt on the part of the defense to argue, as Darrow planned to do, that Darwinian evolution did not conflict with The Bible, would prejudice the jury. As Dayton city attorney Tom Stewart said, "It isn't competent to bring into this case scientists who testify as to what the theory of evolution is or interpret the Bible or anything of that sort." As Raulston later excluded Darrow's experts from evidenc, though, the question of expert witness testimony became an issue less on account of its presence than on account of its absence. In any case a day-by-day summary of the trial, in which parents, students, and other members of the Dayton community is not warranted here. In the next section, though, I turn to the small amount of expert witness testimony that was allowed in the

trial, including what is usually thought to be the trial's climax, William Jennings Bryan's "expert" testimony on the Bible.

### **Preparing the Corpus**

In order to prepare this corpus, I have followed the principles in Martin Weisser's *Practical Corpus Linguistics*. Transcripts of The Scopes Trial have, fortunately, remained in print more or less since the trial occurred. I have consulted The National Book Company's transcript of trial, which was originally published in 1926 and most recently appeared in a special edition for "The Notable Trials Library" of Gryphon Editions, Inc. Owing to the relatively short length of the testimony needed for my work and to inconsistencies created by converting a scanned PDF file into a usable plain text file, I decided to manually transcribe the testimonies of zoologist Dr. Maynard Metcalf, the only scientific expert witness to actually testify at the trial, and William Jennings Bryan, who testified as an "expert" on The Bible into digital format, which I then saved in both .docx format and plaintext format. I copied the printed text almost exactly, but I did make small corrections to the transcription where obvious errors of spelling or punctuation occurred. This error correction was necessary to ensure that the correct words were recognized by AntConc and that the correct boundaries within and between clauses and sentences were recognized. Fortunately, I had to make only five corrections to spelling and only one correction to punctuation. Although I have left some errors of punctuation intact, I have done this to preserve my fidelity to the original and because making further changes to punctuation would not further affect my results since I am focused here on the frequency of modal verbs. Furthermore, features irrelevant to the analysis of modal verbs, such as the line number of the court transcripts, were also removed. This kind of alteration, while producing a text slightly different from the original court transcript, nevertheless serves to isolate the frequency, context,

and ways in which expert witnesses use modal verbs, the textual features relevant to my research question.

Although my transcription includes Darrow's questions and various responses from Judge Raulston and various members of the defense and prosecution, I extracted Metcalf's and Bryan's words from the rest of the text and isolated them into their own plaintext files. From there, I further isolated only the sentences in which modal verbs are used. This resulted in some overlap, as some sentences use more than one modal verb. Rather than introducing any problems, though, this allowed me to see how modals might be used in dynamic combinations. After extracting the relevant sentences, I coded each clause containing a modal verb with an epistemic use, noting whether it was used in an epistemic, deontic, or dynamic sense. Although I coded for each type of use, however, I only report below on the epistemic uses of modal verbs.

Because expert witness testimony was ultimately not admitted into the record, Metcalf's truncated testimony and Bryan's largely ceremonial testimony did not contribute to the jury's decision to convict Scopes. As mentioned in the synopsis of the trial, the jury was excluded during both men's testimony, as it was for most of the trial. A question might be raised, then, concerning the relevance of studying their testimony. Two immediate responses seem warranted. First, The Scopes Trial itself has not received even a single citation, so that most any justification to studying the trial must point beyond its legal significance. Second, it is perhaps for Bryan's testimony that the trial is most famous, but Metcalf's testimony has not received, so far as I know, any scholarly attention other than being noted as having occurred. Consequently, both the trial itself and the particular testimony within it have a rhetorical significance independent of the trial's ultimate legal significance. These two reasons alone provide ample warrant for studying the expert witness testimony in The Scopes Trial.

Studying the frequency of such a flexible linguistic feature as modal verbs presents some immediate challenges. Although modals are often used much as an adverb might be – simply positioned next to the verbs that they are modifying – English speakers and writers also deploy them in negated and contracted forms that require additional attention if anything useful is to be gained from observing their frequency. Furthermore, while I have acquired raw numerical data, I ought to note that I would by no means consider these data to be “statistics” in any meaningful way. Rather, I use the word frequency data to make general observations about part-to-whole relationships and to support my qualitative interpretation of how Metcalf and Bryan used modal verbs to construct an epistemic stance supportive of the more general legal position advocated by each man’s side of the case.

### **Some General Principles of Analysis**

Interpreting the use of modal verbs presents several challenges. First, although not all modals have an epistemic use, this is a pretty easy problem to solve. But while “shall,” fortunately the only modal that lacks an epistemic use, can simply be excluded, the remaining modals have epistemic, deontic, and dynamic functions, a problem that necessitates close grammatical and contextual analysis. While distinguishing between epistemic and deontic uses of modals presents few challenges in most cases, distinguishing between epistemic and dynamic uses of modals requires one to separate the epistemic judgment from other concepts, such as volition or ability. Indeed, as Palmer, Pullum, and Huddleston admit, sometimes it is not possible to clearly categorize a particular use of a modal verb as either epistemic or dynamic.<sup>261</sup> In the

---

<sup>261</sup> See Palmer, *Modality and the English Modals*, 13. In analyzing my data, I have consulted this volume in addition to Pullum and Huddleston, *The Cambridge Grammar of the English Language*, extensively. These two volumes have been especially useful in helping me to understand the often-imprecise concept of modality and its expression in English. As I have completed this project, I have spent many afternoons flipping back and forth between my corpus data and these two books.

interest of keeping my claims as narrow and precise as possible, then, I have categorized as “epistemic” only those uses of modal verbs that have an unambiguously epistemic function. In other words, I have included only those modals in which the *speaker is expressing a judgment about the truth of the statement*. While notions with epistemic implications, such as volition and ability, are likewise expressed in English using the modal verbs, I have deliberately excluded such uses on account of the secondary nature of the epistemic meaning in such constructions. Those interested may refer to my coded set of the sentences collected from Metcalf’s and Bryan’s testimony, which I have made available online.<sup>262</sup>

### **Analysis of Metcalf’s Testimony**

The testimony of Dr. Maynard Metcalf, a zoologist affiliated with Oberlin College, took place on the afternoon of Wednesday, July 15<sup>th</sup>, the fourth day of the trial. Metcalf was the first of several expert witnesses that Darrow had planned—before Raulston’s exclusion of experts—to introduce. In an exchange that, including the words of others, totaled only 3,573 words, including included 845 unique word tokens, Metcalf did not have the chance to discuss much. After Darrow had established his credentials, prosecutorial objections to the admissibility of expert witness testimony quickly took over the discussion. In his brief time on the stand, though, Metcalf did manage to articulate his rejection of the conflict thesis and that, in his personal experience, some version of evolutionary theory was subscribed to by, as he put it, “all of the zoologists, botanists, and geologists of this country who have done any work.” Given that Metcalf contributed to two vital planks in the defense’s case in such a short testimony, the

---

<sup>262</sup> My coding of Metcalf’s testimony can be found at: <https://docs.google.com/document/d/1C9MvQhCBLPWSLRiXrwOLSWscxVnwkaBF/edit?usp=sharing&oid=10519100329359831289&rtpof=true&sd=true>. Meanwhile my coding of Bryan’s testimony can be found at: [https://docs.google.com/document/d/1DkkoPX9frcERfKq9PBAAiswer\\_CdT82/edit?usp=sharing&oid=10519100329359831289&rtpof=true&sd=true](https://docs.google.com/document/d/1DkkoPX9frcERfKq9PBAAiswer_CdT82/edit?usp=sharing&oid=10519100329359831289&rtpof=true&sd=true).

prosecution's desire to have it excluded seems eminently reasonable.

A broad view of Metcalf's testimony reveals that modal verbs played a small but significant role in key elements of Metcalf's contribution to the defense's rhetorical and epistemic stance. While it may seem negligible that only 31 word tokens of the modals appear throughout Metcalf's 1,114 word testimony, 15 times that he did use modals—almost half—were epistemic uses. Significantly, not all eight epistemic modals appeared in Metcalf's testimony. Metcalf used six modals—would, may, can, might, will, and could—to make four distinct moves with respect to his rhetorical and epistemic stance. Using these six modals, Metcalf establishes the scientific consensus on evolution, establishes limits on his ability to define evolution, explicates the evidence for evolution, and locates man with the evolutionary scheme. Taken together, these moves constitute an epistemic stance marked as much by what *cannot talk about* as by what it *can talk about*. Indeed, it may even be that Metcalf's absence of certainty, even while he evinces confidence in his position, most characterizes his testimony. As much of the particulars of his and Bryan's respective positions, then, this attitude toward knowledge, particularly about what human minds can and cannot be certain about, differentiates the two witnesses.

For each modal verb, the following table reveals frequency in terms of number of word tokens, rank with respect to the number of unique word tokens in the whole testimony, the number of epistemic uses of each modal verb, the number of unique verbs modified by each epistemic modal, and the verbs modified by each epistemic use of a modal verb. After discussing each modal verb, starting with those with the most frequently appearing word tokens, I will discuss how Metcalf combines the modals with each of these verbs to unify his epistemic stance with his rhetorical stance. We also see that, while 9 statements were coded for the epistemic

sense of possibility and 6 for the sense of necessity, the preference was only slight, so that the overall effect is one of balance. This balance is, as I will show later when comparing Metcalf's testimony to that of Bryan, one of the central linguistic features of the expert rhetorical stance.

### Overview of Epistemic Modal Verb Use in Maynard Metcalf's Testimony

<b>Modal Verb</b>	Word token Frequency Rank	<b>Number of Word Tokens</b>	<b>Epistemic Uses</b>	<b>Number of Unique Verbs Modified in Epistemic Uses</b>	<b>Unique Verbs Modified in Epistemic Uses</b>
would	1	7	5	3	be, have, call
may	2	6	5	4	be, class, call, wipe out
can	3	6	0	0	none
might	4	4	3	3	have, question, bring up
will	5	3	1	1	be
could	6	3	1	0	call
must	7	1	0	0	utterance interrupted
should	8	1	0	0	none
<b>Totals</b>		31	15	7	be, have, call, class, wipe out, question, bring up

## Would

Although “would” typically expresses a more “tentative” form of necessity than the strong form expressed by “must,” which doesn’t appear even once in a completed utterance, it still commits the speaker to the likelihood of the statement’s truth. Appearing in seven word tokens, five of which were epistemic uses, “would” emerges as the modal to which Metcalf turns second most frequently. Using epistemic “would,” Metcalf first establishes the scientific consensus on evolution before establishing careful limits on his ability to speak about the topic. These careful acts of consensus building and authority limiting bolster his authority on those subjects he *does* feel competent to speak. Consequently, he is then able to explicate the evidence for evolution, invoke the disciplinary authority of his field, and classify man within the evolutionary scheme—three further ways in which Metcalf uses epistemic “would”— in a much more authoritative way. Taken together, these five uses of epistemic would, features of Metcalf’s epistemic stance, constitute a rhetorical stance notable as much for how it limits its authority as for how it claims it.

That Metcalf should begin and end his testimony by establishing the scientific consensus on evolution does not surprise. Although popular conceptions of science, and certainly those often promulgated by the critics of established science, might stereotype the scientist as a lone truth seeker who must often speak truth to power in the greater service, consensus has, in fact, been the prime mechanism by which practicing scientists have typically separated the proverbial wheat from the chafe. The strong commitment expressed in Metcalf's two uses of epistemic "would" to establish just that consensus, then, emerge as critical to how he establishes *himself* as a person whose opinion matters with respect to the professional consensus of scientists and, by implication, for the question before the court. After establishing Metcalf's credentials, Darrow asks the witness plainly: "Are you an evolutionist?" Metcalf replies "Surely, under certain circumstances that would be an insult, under these circumstances I do not regard it as such." In other words, the presumption of evolution's facticity among zoologists is so strong that to even question whether one's colleague holds the view is to show oneself to be less a member of that community. This particular use of epistemic "would" also draws attention to the way in which the modal degree scale is conceptualized. While the scheme proposed by Palmer in *Modality and the English Modals* would classify this use of epistemic "would" somewhat fuzzily as a form of "tentative" modality, somewhere indeterminately in between possibility and necessity, this sentence seems to provide evidence of the use of epistemic "would" to express that "the speaker

has conclusive objective evidence for the truth of the proposition conveyed,” a construction that has received some attention in recent work.<sup>263</sup>

Returning to this move in a series of clauses within the last complete sentence of his testimony, Metcalf further emphasizes that “I think it would be impossible for any normal human being who was conversant with the phenomena to have even for a moment the least doubt even for the fact of evolution.” Having bookended his testimony on the topic by establishing the consensus on evolution, Metcalf has used epistemic “would” to position himself as speaking *for* a community of experts even as he is speaking *as* an individual.

Having established a consensus on the scientific fact of evolution, though, Metcalf has naturally raised questions about his ability to speak to the topic as an *individual*. Since antievolutionists had long characterized scientists as constituting a kind of secular priesthood, different from the medieval Catholic Church only in that they dictated knowledge from the chairs of university departments rather than from the seat of Rome, the significance of Metcalf’s self-characterization can hardly be understated. Rather than embody the caricature of the “highbrow scientist” so popular in Fundamentalist literature, Metcalf instead used epistemic “would” to place careful limits on his ability to speak about the details of evolution. As his testimony moves away from establishing his credentials and toward discussing evolution, Darrow asks Metcalf to provide a definition of evolution. Demurring, Metcalf responds by observing that “any definition in order to be accurate and adequate would have to be fearfully prolix.” The task of definition itself, he is saying, presents certain insurmountable challenges. Consequently, he asks for a little “leeway” with respect to this task, since, in order to be brief, he must forego some degree of

---

<sup>263</sup> See Gregory Ward, Betty J. Birner, and Jeffrey P. Kaplan, “A pragmatic analysis of the epistemic *would* construction in English” in Roberta Facchinetti, Manfred Krug, and Frank Palmer, *Modality in Contemporary English*, (Berlin, New York: Mouton de Gruyter, 2003), 78.

accuracy. The sentence in which this clause appears, which will be examined again in the discussion of “can,” serves a very important role in defining, from the outset of Metcalf’s discussion of evolution, the limits of what he believes himself capable of speaking on. By carefully hedging his authority with respect to something so broad as the definition of evolution, though, he gains the ability to explicate the evidence for evolution, the main task for which his expertise has been summoned, with more authority.

Indeed, the way in which Metcalf uses epistemic “would” to explicate the evidence for evolution stands out all the more for being paired with an impersonal construction, which only serves to enhance the appearance of objectivity. The careful establishment of the scientific consensus and hedging of his own authority previously discussed having been done for this purpose, Metcalf presents evolution as though it were simply the logically necessary outcome of the physical conditions present on the earth in past geological ages. As he puts it when Darrow questions him about why the physiology of marine animals changed when they migrated to land, “it would be necessary in order to be successful to develop means adequate to meet those difficulties and the needs of such life have been on occasion—not the cause—have been the occasion for the development of the structures needed to meet conditions of existence there.” While the impersonal construction, combined the epistemic adjective “necessary,” provides a double emphasis on Metcalf’s high degree of belief with respect to the evidence of evolution, comparing the relevant clause to an unmodalized version of the same proposition, though, reveals, the role that epistemic “would” plays in helping Metcalf to stop just short of declaring his totally unqualified belief in this evidence. For instance, had he said, imagining the rest of the sentence to remain the same, that “it *was* necessary in order to be successful...” he would have been expressing the highest degree of existential commitment possible.

Given this comparison, one might wonder why Metcalf did not commit himself as fully as possible to this proposition, which expresses one of the most important scientific arguments in favor of evolution. One might consider the immediate consequences, that it is, practically speaking, worse to be wrong when one has made an unqualified commitment to a statement than when one has hedged a little. A more useful explanation might be found in considering the rhetorical benefits of this kind of hedging. By establishing the scientific consensus on evolution and placing limits on his individual ability to speak, Metcalf has already done much rhetorical work to establish an ethos noteworthy for its careful deliberation and non-dogmatic approach to even its own positions. Committing himself more fully to this statement, then, would provide countervailing evidence, resulting in a less coherent overall stance.

Even stopping short of committing himself *absolutely* to the evidence for evolution, however, Metcalf has raised important implications for the role of man in the evolutionary scheme, implications that require him to invoke the disciplinary authority of his field. These two final rhetorical functions of epistemic “would,” which occur in a single sentence, can be understood—just as Metcalf’s hedged stance in discussing the evidence of evolution can be—by reference to the broader form of antievolutionist rhetoric. The detrimental effects of evolution on religious belief and the consequential erosion of morals and public behavior having long been a key point of the Fundamentalist attack on evolution, Metcalf had an important opportunity to mitigate this perception, which formed another component of the “highbrow scientist” stereotype. Asked by Darrow where humans fall within the basic scheme of biological classification, Metcalf replies, “He [the human species] is classed among the primates. Man is not a very highly evolved animal in his body. He isn’t as highly specialized as a great many organisms.” Making man one among many organisms—indeed lower in some respects than

some other organisms—Metcalf ran the risk of offending the sensibilities not only of the trial’s highly religious judge but also of its highly religious jury. Man had to have some special role in the evolutionary scheme if he was to have any role at all. As a mammal, more specifically a primate, however, “man” is still, he says, “A group well up, I think, toward what we would call the elaborated members of that group physically.” Thus, epistemic “would” here allows Metcalf to demote man from one place while still retaining for him a role above the animals that antievolutionists so hated imagining themselves descended from.

### **May**

Although epistemic “may” appears just as frequently as epistemic “would” in Metcalf’s testimony, its five tokens are limited to placing limits on his ability to speak, explicating the evidence for evolution, and classifying humans in the evolutionary scheme. Expressing the base concept of possibility, “may” allows a rhetor considerably more room for error than “would,” however tentative the latter may be. In one especially interesting sentence, Metcalf uses epistemic “may” to create an analogy between the variety of animal species and the variety of humans. Individually and combined, these acts of qualification help Metcalf to construct the careful, deliberate, *discerning* stance Darrow had hoped would help him not so much to win the immediate case, but to begin a successful chain of appeals that would lead to the Supreme Court. This appeal to the proximate rather than the immediate audience will become even more significant when Bryan’s testimony, which reveals that the prosecution constructed practically the opposite stance, is considered alongside Metcalf’s.

Although Metcalf only once uses epistemic “may” to limit his own ability to speak, this singular usage builds interestingly on how he used epistemic “would” to perform the same function. Moving from establishing Metcalf’s credentials to establishing his opinions on

evolution, Darrow asks Metcalf to offer a definition of the term “evolution,” perhaps the most significant term of the trial. Although Metcalf does offer a tentative definition, he does so only after speaking to his limited ability to do so. He responds that, while he will offer a definition of evolution, he will only offer one “that may be as accurate as far as it goes.” In other words, Metcalf is saying that his definition will be accurate only insofar as the term “evolution” is capable of being accurately defined. The significance of Metcalf’s use of “may” to locate this rhetorical limitation outside of himself—thus making it inherent to the task of definition itself—cannot be understated, for it establishes one of the key differences between his and Bryan’s epistemic stances. Whereas Metcalf positions himself as believing that even science, that discipline of knowledge most credited with social authority, can offer only transient, temporary knowledge, Bryan, as will be seen, positions himself as believing that the hallmark of knowledge lies in the establishment of absolutely, unchanging certainty.

Considering the ways in which evolution challenged the assumed centrality of man in the universe, an assumption close to if not lying at the very foundation of the Fundamentalist model of the universe, the rhetorical utility of positioning one’s self as in possession of certain knowledge seems hard to dispute. Metcalf’s two uses of “may,” both in the same sentence, to qualify how he classifies man stand out as attempts to mitigate the ways in which specialized knowledge can clash with what a particular audience takes to be “common sense.” When Darrow asks him to situate primates within the model of evolution and humans within the category of primates, Metcalf replies, “The primates mean that order of organisms which include the lemurs, the tailed monkeys of this hemisphere, the tailless monkeys, the ape and baboon and so on of the eastern hemisphere and man and also quite a large number of forms of whose—of whom we have a satisfactory fossil record which we may class as apes or may class as men.” Though

Metcalf probably could have evinced greater certainty without running too far afield of then-contemporary biology, the rhetorical exigences of the Scopes Trial necessitated making room for the doubt or outright contempt with which many in the jury might greet his claims.

Such doubt or contempt might be doubly expected with respect to how Metcalf twice used epistemic “may” to further explicate the evidence for evolution, including by making an analogy between variation in animals and variation in humans. From the Wilberforce-Huxley debate to the Scopes Trial, Darwin’s demotion of man to just one of many species had been cited by antievolutionists as one of the most pernicious implications of evolution. Consequently, Metcalf’s caution in closing what was then to be only the first day of his testimony can be appreciated. Summarizing his views on man’s place in the evolutionary scheme, Metcalf reasons that the correspondence between the variety of “lower” species discovered to have been deposited throughout geological strata of the planet and the variety of human specimens likewise deposited in these geological strata almost necessitates evolution as an explanatory mechanism. As he puts it:

“When then we find just such differences among species and different varieties of men as we find among animals and when we find what we may fairly call the more lowly genera, species and varieties of human kind appearing earlier in the geological series just as do the simpler animals, among the lower forms appearing in the lower rocks, that inherent compulsion toward belief in evolution which is found in all of the universe is tremendously reinforced for man.”

This qualified analogy has a double effect. Qualifying his position with “may,” which he only does one time, helps Metcalf to provide reassurances that, while evolution may have demoted humans from the central position they occupy in Fundamentalist cosmology, they still

occupy a position *above* those animals which “we may fairly call the more lowly genera.” The epistemic “may” in this clause helps Metcalf to retain a rhetorical stance marked by the careful, precise distinctions that distinguish the natural sciences from less prestigious fields and, of course, common sense while simultaneously mitigating his position according to the sensibilities of the immediate audience. By the same analogical means, Metcalf likewise provides a crucial warrant for the certainty of his belief in evolution, a belief that, by means of the subject “we,” is representative of zoology as a whole.

Further moments in which Metcalf invokes the authority of his field in explicating the evidence for evolution likewise stand out. Prompted by Darrow to say whether he can date the emergence of plants from the beginning of organic matter, Metcalf denies that he can, asserting that, on account of the extinction of past species, a whole range of both plant and animal species might have emerged and then gone extinct without leaving any trace detectable by the zoology and geology of the 1920s. As he puts it, “I am inclined to believe that there may have been whole series of animals and plants living at certain times upon the earth, which have been completely wiped out, to be succeeded...by other fauns and floras.” At the same, he continues, saying that because “we do not know many times the different processes in connection with the change upon the earth’s surface may have wiped out practically all or wholly certain floras or faunas,” knowing precisely when any particular kingdom of organism emerged relative to the general emergence of organic matter cannot quite be known. While Metcalf’s hedging of his rhetorical bets here might seem at first blush to diminish his authority and, by proxy, the authority of evolution, for the immediate audience of the Dayton judge and jurors, qualifying his stance here helps to contribute to the image of scientists the fields they represent as careful, deliberate, and modest in their claims.

## Can

Although “can” appears third most frequently in terms of word tokens, no unambiguous uses of epistemic “can” appear in Metcalf’s testimony. Nevertheless, his use of this modal reveals the difficulty inherent in clearly distinguishing between different kinds of modality, particularly epistemic and dynamic modality. This is a problem that has long been alluded to in the literature on modality.<sup>264</sup> Consider, for example, the challenge of separating the speaker’s judgment of the proposition’s truth from their judgment of volition and ability in this when Metcalf notes that, “a definition is perhaps the most difficult thing that a man can ever be asked to engage in.” The location of the modal in the relative clause restricts its scope such that one strict reading of this sentence might be “While the ability of a person to give a definition seems to be primary, in judging ability one necessarily makes some judgment about the likelihood of something will happen, such as giving a clear and useful definition. Paraphrasing the relevant clauses as something like “a definition is perhaps the most difficult thing that it is possible for a man to be asked to give” adds some clarification while introducing a further issue. Do modalized relative clauses modalize their antecedent nouns in turn? Future investigations into epistemic “can” and the distinction between epistemic and dynamic modality might begin with this question.

Another ambiguous use of “can,” also in a relative clause, further emphasizes the difficulty of making modal distinctions. When Darrow asks about the boundaries of the taxonomic order “primates,” into which evolutionists want to group humans, Metcalf responds, “it is a little hard work to say over half a dozen or so forms about which there can be legitimate differences of opinion as to where they should be classified, whether as man or as ape.”

---

<sup>264</sup> See in particular Palmer, *Modality and the English Modals*, 20-22 and Palmer, *Modality in Contemporary English*, 9-13.

Although both “can” and “should” appear in this sentence, though, should functions here in the deontic sense, leaving only “can” with a possibly epistemic role. Metcalf’s having used “can” to note the real possibility of legitimate difference of opinion among competent zoologists, though, stands out as the primary way in which his epistemic stance will be distinguished from that of Bryan, who will evince total certainty as the main feature of his stance.

One more example reveals the difficulty in separating epistemic from dynamic modality. Asked to similarly define the boundaries of the even broader biological category of mammals, Metcalf again uses “can” to demure, saying, “There again I hate to give a definition, but I can tell you some characteristics of mammals” before going on to name, without posing as definitive, some of the shared features of mammals. Two paraphrases of the relevant clause are possible. In the first, “it is possible for me to tell you some characteristics of mammals,” the notion of possibility predominates. In the second, “I have the ability to tell you some characteristics of mammals,” ability/volition emerge as the dominant categories. In ordinary usage, though, as the frequency of similar such constructions in the English we speak nearly one hundred years later reveals, precise logical distinctions are not always possible.

### **Might**

Both the distinct rhetorical functions of epistemic modality and the difficulty of distinguishing it from dynamic modality recur when comparing Metcalf’s three uses of epistemic “might,” by which Metcalf further explicates the evidence for evolution and established the scientific consensus for it, to a more ambiguous fourth use.

Metcalf uses “might” in order to characterize the attitudes of zoologists and classify mammals, particularly humans, within the scheme of biological taxonomy. In the same sequence of questioning in which he used “can” to qualify what he could offer in lieu of a definition of

mammals, Metcalf notes that “I might, if I stopped to think up my lesson, tell you fifty points that are characteristic of the order of mammals in distinction from other organisms.” These taxonomical distinctions matter because, as has been previously noted, evolution’s apparent challenge to man’s centrality in God’s plan had for years been one of the central tenets of antievolutionist discourse. Skirting upon this issue in a somewhat joking manner, Metcalf notes that “because the group [primates] has been regarded as including man, the group has been given the primacy, I suppose that some of insects, if they were sufficiently intelligent, might question that, but we do not question it.”

Meanwhile, at the end of his testimony, Metcalf uses “might” to recharacterize the general disposition of scientists in general and zoologists in particular. Near the very beginning of his testimony, Metcalf had observed that, while scientists generally accepted the fact of evolution, disagreement might exist as to its mechanism. Returning to this theme, he notes in the final sentences of his testimony that while the fact of evolution is taken for granted, any given particular scientist “might have tremendous doubt as to the truth of any hypothesis—as to the methods of the evolution which this or that or the other man—even great men of science—might bring up.”

### **Will and Could**

Since Metcalf used the two remaining modals, “will” and “could” in an epistemic sense only one time each, they can be dealt with together. Their position at practically opposite poles of the scale of modal degree, with “will” expressing near certainty and “could” expressing possibility so slight that it might even constitute doubt, likewise lends itself to understanding the relationship between modal degree and rhetorical function. As has already been mentioned, Darrow asked Metcalf to define the term evolution very early in the latter’s testimony and, has

also been noted, Metcalf responded by contesting his ability to do so accurately. In his single use of epistemic “will,” Metcalf qualifies his entire answer to that question by requesting that he be “allowed to answer in a way that will certainly not be accurate, but that may be as accurate as far as it goes.” In this sentence, the epistemic use of “will” combines with the negation of the adjective “accurate” to turn the high degree of certainty suggested by epistemic “will” on its head. Rhetoricians, of course, will also recognize negating an adjective this way, whether modalized or unmodalized, as the figure of speech known since antiquity as “litotes,” a form of “understatement that intensifies.”<sup>265</sup> In this way, Metcalf again builds his authority with respect to the particulars of evolution by hedging some of his authority with respect to the concept’s general formulation.

Meanwhile, Metcalf’s lone epistemic use of “could” appears as, asked by Darrow to define evolution, he demurs but seeks to offer as approximate an answer as he can. Taking a few clauses to get started, he finally hits upon as simple a definition as he offers. “The change of an organism from one set characteristic which characterizes it into a different set of characteristics either structural or functional,” he answers, “could be properly called, I think, evolution.” Although not the only key term of the trial— “science” and “religion” immediately stand out as two others—the fact that Metcalf has offered a definition as marked by its qualifications as by its precision will stand out all the more when his use of this modal is compared to how Bryan uses it.

Turning away from the modals to the verbs that they modify, it will likely surprise few that, as a practicing zoologist, Metcalf should use verbs primarily to express states of existence,

---

<sup>265</sup> See Richard Lanham, *A Handlist of Rhetorical Terms*, (University of California Press, Berkeley, Los Angeles, Oxford: 1991), 95-96 for a more thorough definition of this figure of speech in addition to some examples of it. This entire volume offers a pretty good reference source for those interested in the study of figures of speech.

possession, and abstract, mental action rather than concrete, physical action. Indeed, all seven of the unique verbs modified by the epistemic modals have some element of the abstract, even “wipe out” which, will at least evoking physical connotations, primarily denotes violent though unspecified death, typically on the scale of an entire species. More importantly, it can be seen that nearly every verb modalized, indeed all but one, is modalized to come closer, usually far closer, to expressing possibility than to expressing necessity. Taken together, these observations allow for the rhetorical function of the uncertain, tentative epistemic stance to be more fully explicated than has been done in previous literature.

Unsurprisingly, “be,” historically and presently the most commonly used verb in the language, is the verb Metcalf modifies most frequently with the modals. Significantly, however, he only uses “be” with three modals: “would,” “may,” and “will.” This reveals that *nearly all* of Metcalf’s modalized existential statements have been situated on the possibility end of the degree scale. Metcalf’s negation of his lone use of epistemic “will,” paraphraseable as something “my answer is not certain to be accurate,” likewise places this closer to possibility than necessity on the scale of degree, though certainly not so close to possibility as “may” and “would.” In short, Metcalf’s modalized uses of forms of “be” suggest that, when it comes to making abstract generalizations about evolution, a certain amount of hedging is always required. Although the second most frequently used verb in contemporary English, “have” appears only once as the main verb of a sentence in which it is modalized by “may,” placing it firmly with “be” as situating Metcalf’s statements on the possibility end of the modal degree scale.

Of the remaining five verbs, “call,” modalized once by “would,” once by “could,” and a final time by “may,” appears most frequently and likewise situates Metcalf’s statements on the possibility end of the scale. “Class” is used twice as a verb and modalized by “may” both times.

Finally, Metcalf modalizes “question” and the verb phrases “wipe out” and “bring up” one time each, with “might” in the cases of “question” and “bring up” and “may” in the case of “wipe out.”

### **Analysis of William Jennings Bryan’s Testimony**

Since Bryan’s testimony includes 4,861 words, about 36% more total words than Metcalf’s testimony, one would expect the base number of modal verbs to be higher in Bryan’s testimony than it was in Metcalf’s. What even a cursory look at Bryan’s use of modals reveals, though, is both a general degree of modal use and the particular usage of certain modals, such as *would*, also the modal most frequently used by Metcalf, that far exceed the degree to which Bryan’s testimony is simply longer than Metcalf’s. What we also see here is the linguistic core of the anti-expert rhetorical stance. Of Bryan’s 58 epistemically modalized statements, 39 were coded for the sense of certainty, more than double the 17 statements modalized for possibility. Put simply, this means that, despite its opposition to experts and expertise, *certainty* lies at the heart of the anti-expert stance. Comparing Bryan’s testimony to that of Metcalf, we see both the preference for certainty itself and the extent of that preference distinguishing the anti-expert from the expert rhetorical stance.

### **Overview of Modal Verb Usage in Bryan’s Testimony**

<b>Modal Verb</b>	<b>Word Token Frequency Rank</b>	<b>Number of Word Tokens</b>	<b>Epistemic Uses</b>	<b>Number of Unique Verbs Modified in</b>	<b>Unique Verbs Modified in Epistemic Uses</b>

				<b>Epistemic Uses</b>	
would	1	43	24	14	be, attempt, fall, set, say, call, put, run back, like, express, get to, lead, consider, want
will	2	25	15	9	protect, tell, have to (semimodal), take, show, give, insist on, answer, accept
can	3	23	5	3	measure, tell, give
could	4	13	2	2	give, draw
may	5	7	5	3	be, use, live
might	6	7	7	6	be, use, say, help, raise, continue
should	7	3	0	0	(none)
must	8	0	0	0	(none)
<b>Totals</b>	–	123	58	31	be, attempt, fall, set, say, call, put, run back, like, express, get to, lead, consider, want, protect, tell, have to (semimodal), take, show, give, insist on, answer, accept, measure, draw, use, live, say, help, raise, continue

## Would

Of the 43 tokens of “would” in Bryan’s testimony, just over half constitute epistemic uses of the word, revealing that Bryan uses “would” in an epistemic sense almost more frequently than he uses any other modal verb in *any* sense. Comparing Bryan’s testimony to that of Metcalf, one can observe a much more even distribution of modals in Metcalf’s testimony than in Bryan’s. Taking a closer look reveals that Bryan uses epistemic “would” to explicate a literal reading of Genesis, speculate on the age of the earth, characterize non-Christian religions, and to criticize the evidence for evolution. Taken together, these strategies cast Bryan as an almost Christ-like figure, at least according to his own perception, and bolster the claim that the trial represents the interests of hostile secularists from outside of Tennessee attempting to subordinate the rightful authority of parents and local communities, a claim that Bryan had been making since even before the trial began.

In the greater part of his testimony and so, unsurprisingly, the greater part of his use of epistemic “would,” Bryan explicates his literal reading of Genesis. In one exchange, Darrow asks Bryan whether and how God might have lengthened the day on behalf of the Israelites, an episode recorded in the Book of Joshua, and Bryan responds by using epistemic “would” in the construction of a surprisingly naturalistic analogy. As he puts it in a sentence that uses epistemic “would” three times, “I would not attempt to say what would have been necessary, but I know this, that I can take a glass of water that would fall to the ground without the strength of my hand and to the extent of the glass of water I can overcome the law of gravitation and fill it up.” By admitting his uncertainty in the first clause of this sentence, Bryan draws attention to what he “knows” in the second clause. Significantly, he describes himself as “overcoming” the law of gravity instead of simply acting as the agent of *other* physical laws. God, Bryan asserts in

another use of epistemic “would,” stands in the exact same relationship to nature in general as Bryan does to the particular glass of water, observing that “If my puny hand can overcome the law of gravitation, to that extent, I would not set power to the hand of Almighty God that made the universe.” In this last clause, Bryan makes the case for God existing not as *part of nature* so much as he exists *over and above* nature, capable of intervening at any point and acting outside the laws of nature even as he sets them.

Despite arguing in favor of a literal reading of Genesis, Bryan proves himself surprisingly amenable to the day-age theory when he speculates on the age of the earth, a rhetorical move that entails even more use of epistemic “would” than did his discussion of how to interpret the Bible. The day-age theory, discussed earlier in this chapter, attempts to account for the “days” of Genesis by rendering them as indeterminate periods of time, which could be equal or unequal in length, so that apparent contradictions between Genesis and the geological, fossil, and other evidence discovered by scientists might be reconciled. Addressed briefly in the first half of Bryan’s testimony, questions about what Bryan believes about the age of the earth comprise much of the second half of Bryan’s testimony, including the “climactic” moment when Darrow “forces” Bryan to admit—to the gasps of the crowd—that Earth might not have been made in six twenty-four-hour days. Asked early in his testimony, for example, about the age of the ancient civilizations of China, Bryan confesses his ignorance of them but notes concurrently that “they would not run back beyond the creation, according to the Bible 6,000 years.” Asked later, however, to date the Tower of the Babel relative to the most recent glacial ice age, Bryan changes his tune, prevaricating and observing that “I wouldn’t want to fix it. I think it was before the time given in here, and that was only given as the possible appearance of man and not the actual.” A few sentences later, he admits outright ignorance with respect to the age of the earth.

The more Bryan discusses the age of the earth, the more such ignorance he is forced to admit, until the disparity between the certainty of his avowed stance and the ignorance that he actually displays becomes the focal point of his testimony. Darrow eventually asks Bryan point blank whether the latter believes that God created the world within six twenty-four-hour days. Bryan's response, which both shocked the court's spectators and constitutes an important use of epistemic "would," stands out as much for what it affirms as what it denies. "No," Bryan says, "But I think it would be just as easy for the kind of God we believe in to make the earth in six days as in six years or in 6,000,000 years or in 600,000,000 years. I do not think it important whether we believe one or the other." In this sentence, Bryan denies not only the reading of Genesis he had just been articulating but also the very importance of taking a position on the issue. Up until this point, the *certainty* with which Bryan had postured about his reading of the Bible and the age of the Earth had very much been the point of his crusade against evolution, particularly in the way that he presented himself. With this one sentence, Bryan diminished the rhetorical stance that he had so carefully constructed for himself, a stance marked by the certainty that justified the zeal that others might have criticized as excessive on account of the very kind of question, the age of the earth, that he had claimed to be able to answer definitively.

Although Bryan displays considerably more knowledge when he characterizes non-Christian religions, a third way in which he uses epistemic "would," he never quite escapes the impression that the extent to which he knows anything about Christianity must be marked by profound ignorance with respect to other topics and, of course, other religions. At one point before Bryan's "climactic" endorsement of the day-age theory, Darrow asks Bryan to compare Christianity to other religions, and the already beleaguered witness chooses to discuss Confucianism and Buddhism, both of which were already considered by some to be less religion

than philosophy. Contrasting the ethical precepts of Confucianism with those of Christianity, for example, Bryan relates an anecdote, presumably with reference to the Analects, in order to explain how Confucianism's emphasis on *reciprocity* distinguishes it from the "Golden Rule" of Christianity. As Bryan describes it, "In the first place, one of his [Confucius's] followers asked if there was any word that would express all that was necessary to know in the relations of life, and he said, "Isn't reciprocity such a word?" In this use of epistemic "would," Bryan characterizes non-Christian religions as marked not only by their different ethical precepts, but also by their more tentative nature. Although I did not code his concluding remark about the difference between Christianity and Confucianism as an epistemic use of "would," it is also worth including here so as to more fully appreciate Bryan's point. In Bryan's final analysis, Christianity and Confucianism differ because "there is all the difference in the world between a negative harmlessness and a positive helpfulness and the Christian religion is a religion of helpfulness, of service, embodied in the language of Jesus when he said 'let him who would be chief among you be the servant of all.'" The sentence that Bryan paraphrases from the Bible, with its notion of volition, also illustrates the difficulty in coding for epistemic as opposed to dynamic modality. While simply *willing* something to be the case definitely entails the notion of possibility, the main emphasis falls not on the speaker's attitude toward possibility but on his internal desire to see something become the case.

While Bryan seems to speak with some competence, or at least without incompetence, with respect to Confucianism, his discussion of Buddhism reveals once again the striking difference between his performative certainty and his actual ignorance. Bryan's discussion of Buddhism, which he describes as an "agnostic religion," brings him to relate an anecdote of a trip he made to Yangon (then known as Rangoon), Burma. There, he was informed by "one of

the Buddhists” about a delegation soon to be sent to an “agnostic congress” that would soon be held in Rome. From thence, he went to a man whom he describes as a “Buddhist priest,” who told him that “the most important thing was you didn’t have to believe to be a Buddhist.” Bryan’s knowledge of the alleged agnosticism of Buddhism, the only information that he actually cites about this religion, comes exclusively from this encounter. Upon further questioning, Bryan suggests that he was able to determine that this man was “an Englishman” and that “he was what I would call an average looking man.” This use of epistemic “would” serves to reduce Bryan’s evidence for this encounter to an essentially subjective experience. If one already believes Bryan, then this story seems plausible. If one is already, like Darrow, disinclined to believe Bryan, then this story seems absurd and designed specifically to allow Bryan to ridicule religions that differ from his own. It does, in any case, stand out against the other ways in which he uses epistemic “would” and, furthermore, the way in which he vociferously protests the unfair treatment that the Christian religion and he himself are receiving under the defense team’s examination.

Bryan’s religious aggression notwithstanding, he discusses evolution itself in an especially circumspect manner, using epistemic “would” to disavow what he *doesn’t* believe while, in most cases, refusing to say outright what he does believe with respect to the evidence for evolution. This tactic essentially construes belief in evolution as an ultimately private matter, with respect to the evidence for the theory provided by biologists only one variable among many to be considered and ultimately under the epistemic authority of the individual rather than that of the scientific community. Asked, for example, to name a scientific criticism of evolution, Bryan points to the work of George McReady Price, who was discussed earlier in this chapter as the progenitor of “flood geology” (and whose work will be a major influence on the “creation

scientists” to be discussed in the next chapter). Asked about McReady’s qualifications, Bryan retorts, “I am not sure that I would insist on some particular geologist that you picked out recognizing him before I would consider him worthy if he agreed with your views?” This acerbic remark reveals that Bryan essentially views the debate over man’s origin primarily as a conflict between worldviews within which one’s philosophical or religious inclination subordinates one’s notion of “science.” Bryan, who throughout his testimony has adamantly refused to “take the opinion of people who are trying to find excuses for rejecting the Christian religion,” places the burden of “reconciliation” between science and religion more squarely on the shoulders of scientists than on religious believers. Where science and religion seem to conflict, it is science that bears the burden of proof—*science* must illustrate that it is not in error rather than the other way around. Consequently, he can say, with complete satisfaction, “I wouldn’t be able to tell you that” when Darrow asks him about when the last glacial ice age occurred and, at the same time, maintain that Darwinian evolution is not only religiously offensive but also scientifically pernicious. That this would strike non-Fundamentalists as a glaring contradiction or error in his thinking is precisely the point, for Bryan thinks science ultimately has the responsibility to conform to religion such that the knowledge of any scientist, no matter how learned, might be regarded as nearly nothing when compared to the unyielding faith of a Christian believer.

When the number of unique verbs modified by epistemic “would” in Bryan’s testimony is compared to the number of unique verbs modified in Metcalf’s testimony, distinctions with respect to verb variety and to the role of negation emerge almost immediately. First, Bryan used a variety of verbs far out of proportion to the simply greater length of his testimony. In addition to using epistemic “would” nearly five times as frequently as did Metcalf, Bryan also used nearly five times as many *different* verbs as Metcalf did. Significantly and usefully, every verb used by

Metcalf was also used by Bryan, which allows for a clearer picture of the differences between how they used epistemic “would” to emerge. Whereas Metcalf sticks primarily to “be” and “have,” verbs that simply “report” existential conditions, Bryan’s testimony contains many verbs that express subjective perception and allow room for error, such as “consider,” “express,” and, even more frequently, “attempt.” One might speculate on whether this difference reveals more fundamental differences between their worldviews, but the more immediate issue is that it does reveal how, whether consciously or unconsciously, each witness actively construed the questions of fact and value raised by the case, though the jury’s absence during the expert witness testimony in this case perhaps makes the judge, attorneys, and posterity the ultimate audience for these strategies.

A second distinction between Metcalf and Bryan’s use of epistemic “would” appears when one considers the role of negation in each man’s testimony. In Bryan’s testimony, nine out of the twenty-four clauses in which epistemic “would” appears negate either the modal relation or the verb modified by the modal. This occurs most often when Bryan uses epistemic “would” to modify the verb “attempt.” Whereas negation *does* appear (only once) when Metcalf uses “would” in a dynamic sense, it does not appear at all in his use of epistemic “would.” Much of Bryan’s testimony, then, can be read as an extended exercise in the strategic use of litotes. Faced with hostile questions from a hostile interlocutor—at least that is the way Bryan seemed to perceive the situation—Bryan responded by speaking to what he didn’t believe rather than clearly articulating a position that he knew would face at least some ridicule.

## **Will**

Correlations between grammatical form and rhetorical function similar to those found in Bryan’s use of epistemic “would” appear among the clauses in which Bryan uses epistemic

“will.” Of the 25 tokens of this modal appearing in Bryan’s testimony, 15 were epistemic, approximately the same proportion of epistemic to non-epistemic uses as was found in Bryan’s uses of epistemic “would.” At the same time, Bryan uses epistemic “will” in these instances to perform three of the same main rhetorical functions that I observed in my analysis of epistemic “would.” Namely, Bryan uses epistemic “will” to characterize non-Christian religions, articulate the evidence for a young earth, and attribute negative motives to Darrow and the defense team. Notably, the actual evidence for or against Darwinian evolution does not feature in Bryan’s uses of epistemic “will” except insofar as he attributes hostile ambitions, typically the discrediting of the Bible, to those persuaded by the evidence for evolution.

In using epistemic “will” to characterize non-Christian religions, Bryan means to defend why he dismisses religions much older than Christianity, specifically religions such as Confucianism, Zoroastrianism, and Buddhism. More precisely, Bryan hopes to show that the claims made about these other religions are proffered only as a means of avoiding the commitments of Christianity. Asked, for instance, about his awareness of Zoroastrianism’s great age, which Darrow described as “much older than Christianity,” Bryan retorts that he is unwilling “to take the opinion of people who are trying to find excuses for rejecting the Christian religion when they attempt to give dates and hours and minutes, and they will have to get together and be more exact than they have yet been able, to compel me to accept just what they say as if it were absolutely true.” In other words, Bryan disputes not the ages attributed to such religions but the motives of those attributing ages to these religions. Consequently, he can perform, as he does here, a vague, generalized sense of doubt without the logical burden of being attached to a specific claim or source of evidence. Modifying two verb phrases, “get together” and “be more exact,” epistemic “will” helps Bryan to shift the burden of proof from himself back

onto Darrow's cited scholars so that, in the end, Bryan has characterized the doctrines of non-Christian religions by their disagreements with Christianity and practitioners and scholars of the same religions by their purported attempt to avoid it.

Less frequently and more prevaricatingly, Bryan deploys epistemic "will" to articulate the evidence for a young earth, evidence that appears primarily as an appeal to the Bible, but which also appears as general appeal to science. Indeed, Bryan makes much not only of the Bible itself but also of its language. At one point, for instance, Darrow's questions include what might be considered a caricature of Genesis's story of the Fall of Man. Bryan, recognizing this, retorts, "I ask to put that in the language of the Bible, for I prefer that to your language. Read the Bible and I will answer." The rhetorician, naturally, will not be surprised by this explicit recognition of language's power to frame the basic issues of a debate as Bryan makes the language of the Bible – the language of his particular worldview – the condition for Darrow's further pursuit of this question. When Darrow does not relent in his characterization of the Bible's stories, Bryan goes even further, saying, "I believe the Bible as it is, and I do not permit you to put your language in the place of the language of the Almighty. You read that Bible and ask me questions, and I will answer them. I will not answer your questions in your language." That Darrow held a King James Bible in hand as he examined Bryan might be lost on contemporary readers of the transcripts but for Bryan's reference to "that Bible" as Bryan repeats his effort to get Darrow to concede to his linguistic frame. Those familiar the controversies over creation science and intelligent design that followed the Scopes Trial will recognize that it was precisely this dispute over linguistic framing that prompted a number of the legislative and activist skirmishes that precipitated *McLean v. Arkansas* and *Kitzmiller v. Dover*.

In an additional anticipation of the later terms of engagement, Bryan uses epistemic “will” to appeal to science through the work of George McReady Price, the founder of “flood geology” and a major progenitor of the creation science movement that would find itself testifying for the defense in *McLean*. After Bryan admits that he does not actually know the age of the earth but that, perhaps, the estimation of a scientist might come closer, Darrow accuses Bryan of not esteeming scientists very much. Protesting that he does highly of scientists, Bryan notes “I will give you George M. Price, for instance,” an example that commences a brief discussion of Price’s qualifications and works.

The subsequent exchange, while not containing further examples of epistemic modals, illustrates how the trial touches upon the very definition of expertise and the role of experts, and so is worth discussing in a little more detail. Asked about Price’s identity, Bryan lists, though somewhat circumspectly, Price’s titles, describing him as “professor of geology at a college.” As discussed in chapter one, the appeal to titles, credentials, and other honorifics has been a long-studied component of both the rhetoric and the philosophy of expertise, so the appeal itself does not surprise so much as its vagueness. As will be seen later, two of the intellectual offspring of the anti-evolution movement, creation science and intelligent design, likewise make similarly vague and general appeals to titles, credentials, and concepts, linguistic moves that differentiate them from their opponents in the scientific mainstream. The trial likewise touches upon the problem of competing experts when Darrow notes that Lodi College, the school that employs Price, is a “small college,” a remark that prompts to Bryan to complain that “I didn’t know you had to judge a man by the size of the college,” a criterion which Darrow also disputes. In other words, this exchange shows that, even given more-or-less clear standards for differentiating experts from non-experts and experts from each other—and it remains disputable how clear any of

the standards proffered so far have been—rhetors in the courtroom still dispute how to *apply* those criteria to particular cases.

Despite Bryan's frequent characterization of other religions or articulation of the evidence for a young earth, he uses epistemic "will" most often to attribute negative motives to the defense team and the supporters of evolution. These motives, more specifically, range from attempting to discredit Bryan as an individual to trying to cast doubt on the Bible. Indeed, it is probably no coincidence that Bryan suggests that those who believe in evolution *and* those who believe in non-Christian religions (regardless of how they feel about evolution), have the common motive of trying to avoid committing themselves to Christianity, the only true religion. Thus, Bryan suggests that, secretly, most evolutionists and most non-Christians actually acknowledge the truth of Christianity; only in an attempt to further deceive themselves and perhaps the impressionable world do they persist in publicly maintaining their error. Thus, scholars who have dated other civilizations and religions become cast as people trying to find excuses for disbelieving in the Bible, and Bryan describes Darrow himself as having a similar purpose. As Bryan puts it in both his final lines of the trial and his final uses of epistemic "will", "The only purpose Mr. Darrow has is to slur at the Bible, but I will answer his question. I will answer it all at once, and I have no objection in the world, I want the world to know that this man, who does not believe in God, is trying to use a court in Tennessee—to slur at it, and while it will require time, I am willing to take it." It was not long, of course, until Bryan's own fellow prosecutors requested that Raulston end his testimony, confining whatever arguments he may have made to the realm of speculation.

Comparing the number of unique verbs used by Bryan to the number of the same used by Metcalf reveals that the disparity in frequency is reflected in the disparity of verbal variety.

Whereas Metcalf used epistemic “will” with only a single verb, the nine unique verbs Bryan used with epistemic “will” show Bryan’s epistemic stance oscillating between two poles. Verbs like “protect,” “insist on,” and “answer,” express Bryan’s complete certainty toward the doctrines of Christianity and help him to construe supporters of evolution, in particular Darrow, as aggressors against which Bryan is only defending himself. At the same time, these verbs express Bryan’s total disbelief in evolution. The most significant distinction between the epistemic stance revealed in Bryan’s use of epistemic “will” and that revealed in Metcalf’s, however, is that Bryan’s stance leaves *no room for qualification* toward either position. One is either entirely in the camp of the “evolutionists” or one is for the Bible. In other words, Bryan is construing the origin of human beings, one of the most fundamental scientific questions at issue in the trial, as a question of a fundamentally different type than Metcalf. Whereas Metcalf has portrayed the question as one for which even scientists can achieve only temporary, provisional answers, Bryan has portrayed the question, *both as a religious and as a scientific matter*, as a question about which one *can* have certain knowledge. More significantly, that certain knowledge requires not the specialized training of scientists, but everyday common sense sincerely applied to the King James Bible.

### **Can**

Although Bryan uses “can” third most frequently when measured by total number of modal verb word tokens, this word appears only five times in an epistemic sense. Even so, three out of Bryan’s five epistemic uses of “can” modify unique verbs, giving “can” the highest ratio of epistemic uses relative to unique verbs. Using epistemic “can,” Bryan positions himself as knowledgeable of non-Christian religions and characterizes the motives of the defense. He notes

of Buddhis, for instance, he “can tell you something about that, if you would like to know.” This, however, is not really the most interesting part about the way Bryan used epistemic “can.”

More interesting is Bryan’s use of epistemic can in a rhetorical question to challenge Darrow’s knowledge of the ancient world. Perhaps Bryan, exasperated by Darrow’s obvious efforts to reveal the Great Commoner’s ignorance of science, hoped to turn the tables on the defense when he asked, “Can you tell me how many people were on the earth when Christ was born?” Obviously, Bryan means to suggest by this question that Darrow cannot tell him the number of people who were on the earth when Christ born so that, by implication, Darrow’s own lack of knowledge on the same topic about which he is questioning Bryan comes to light. Rhetorical questions with this effect have been previously identified by Ward Farnsworth, who observes that in such cases “the speaker expects that no good answer is possible, or wants to make a statement indirectly by burying it in the question’s premise.”<sup>266</sup> Bryan shows here that epistemic modal verbs can be particularly useful for achieving this effect because they allow a rhetor to cast doubt on the very possibility of something with only a single word. As Farnsworth observes, “embedding the incendiary claim in the premise makes it seem safe and secure, since it serves as the basis for a question and seems to be taken for granted.”<sup>267</sup> Since so many of Bryan’s premises seemed, if his characterization of the defense is taken at face value, to be under attack, this move allowed Bryan to reassert himself by shifting the burden of proof back onto Darrow.

## Could

Although Bryan deployed epistemic “could” only twice, he modified a unique verb with each use, making this modal the only one used in his testimony to demonstrate 1:1 ratio of

---

<sup>266</sup> Ward Farnsworth, *Farnsworth’s Classical English Rhetoric*, (David R. Godine: Boston, 2011), 307.

<sup>267</sup> *Ibid*, 317.

epistemic modal to unique verb use. Each clause containing epistemic “could” also serves a distinct, though by now familiar, rhetorical purpose. The first example, which overlaps with a sentence featuring epistemic “would,” has already been considered. In it, Bryan complains of the way Darrow is treating him, asking him “When you display my ignorance, could you not give me the facts, so I would not be so ignorant any longer?” Since Bryan’s efforts to characterize the defense’s hostile motives have already been considered, it is enough to note that this sentence illustrates the way in which distinct modals, each indicating different degrees of possibility or necessity, can function together toward a common rhetorical end.

In the second example, Bryan uses epistemic “could” to bolster the authority of the Bible. Having interrogated Bryan about the Garden of Eden, Darrow then questioned him about the Genesis story of the Tower of Babel, which the Bible uses to explain the diversity of human languages. Assuming the Usher Chronology that Bryan assumes and adding that to that the present, Darrow tries to calculate exactly how long ago the events recorded in this story might have taken place, arriving at 4,155 years. To make sure his point is clear, Darrow asks directly “Up to 4,155 years ago every human being on earth spoke the same language?” Bryan, unshaken by the absurdity that Darrow’s question attributes to his position, replies “Yes, sir, I think that is the inference that could be drawn from that.” This sentence offers one of the few examples of Bryan expressing something less than near-certainty, perhaps because he realized the obvious implications of Darrow’s line of questioning.

## **May**

Since “may” appears in general English speech more frequently in an epistemic than in a deontic or a dynamic sense, it was not surprising to see, at 60%, such a high percentage of epistemic uses of “may” compared to that of other modal verbs. Two of the three uses appear in

relatively short succession and concern themselves with defending the inerrancy of the Bible, a task which Bryan spent much of his testimony doing. More significantly, Bryan’s third use of epistemic “may” is deployed toward a related but also somewhat unique end: characterizing other groups of Christians. This move has twofold significance in that characterizing themselves as the *only* representatives of Christianity was a common trope in Fundamentalist discourse of the 1920s, not only for the movement in general but also for Bryan in particular. Even today, this sort of policing or tightening of the boundaries between Fundamentalist and other forms of Christianity remains both a frequent rhetorical move and a frequent basis for more concrete practices. The young-earth ministry Answers in Genesis, which, even more than organizations like The Discover Institute, might be considered the successors of Bryan, makes distinguishing between “authentic” and inauthentic forms of Christianity one of its signatures.<sup>268</sup>

### **Might**

Although tied with “may” for the smallest number of word tokens (for modal verbs actually used in an epistemic sense, at least), “might” stands alone among the modals used in Bryan’s testimony in that Bryan used it in an epistemic sense in every instance. Thus, although “last” with respect to number of word tokens, “might” ranks first when measured by the ratio of word tokens to epistemic uses. When compared to how Metcalf used epistemic “might,” an interesting similarity can be observed. Although Metcalf used epistemic modals in general and “might” in particular far less frequently than Bryan did, his use of epistemic “might” illustrates the same tendency that I have just described in Bryan’s testimony.

---

<sup>268</sup> See, for instance, Benjamin Huskinson, *American Creationism, Creation Science, and Intelligent Design*, (Cham, Switzerland: Palgrave Macmillian: 2020): 94-95 for a discussion of the ways in which AiG has done this with their recent “Ark Encounter” theme park attraction. Not insignificantly, the literal occurrence of the Noachian Flood and current people’s descent from Noah’s Family, of course, made up a significant part of Darrow’s examination of Bryan.

In total, Bryan uses epistemic “might” to defend Biblical inerrancy, characterize the relationship between Christianity and other religions, and to explicate the scientific evidence for creation. Since each of these three moves has been discussed at some length by now, I will offer just a single example of how Bryan uses epistemic “might” toward each end. Darrow began his examination of Bryan by asking him about the methods he had used to arrive at the Biblical interpretations that Bryan had expounded in his writings. Revealing a key component of the Fundamentalist worldview, however, Bryan virtually *denies* that his explications of the Bible constitute interpretations at all. As he puts it, “I presume that my discussion might be to some extent interpretations, but they have not been primarily intended as interpretations.” While the low level of certainty expressed in this statement might seem strange or plainly false to contemporary readers, to a Fundamentalist like Bryan in the 1920s, there was no such thing as Biblical interpretation. There was only the plain meaning of the Bible. The importance of this epistemic stance cannot be understated, for if there is only the plain meaning of the Bible, then understanding the Bible requires not the specialized training to be acquired by lengthy and costly training at a university, but the common sense given to every man and woman by God. For Bryan to admit that he was only interpreting the Bible would be to performatively defeat the very absolute, unshakable faith in the Bible that he claimed to be on the witness stand to defend. While the logic of this stance might be eminently questionable, its rhetorical efficacy is much harder to dispute. Just as Bryan enjoyed great popularity in his own day, so too do his contemporary intellectual descendants enjoy worldwide influence and control over ministries that make even more money than Bryan himself did.

This performative certainty, which by now seems one of the hallmarks of Bryan’s epistemic stance, likewise in how Bryan uses epistemic “might” to characterize non-Christian

religions. In the modals previously discussed, I have illustrated how Bryan characterized Buddhism and, to a certain extent, Confucianism, the ethical precepts of which are characterized by Bryan here as almost diametrically opposed to those of Christianity. As he puts it, Christianity teaches us to help others “not in proportion as they might have helped us, but in proportion to their needs,” and, consequently, “there is all the difference in the world between a religion that teaches you to keep even with other people and the religion that teaches you to spend yourself for other people and to help them as they need help.” However accurate or inaccurate Bryan’s discussion of Confucianism may be, this statement reiterates the unique position into which he places Christianity and, by implication, Christians. To Bryan, the question of many different, mutually exclusive interpretations of Christianity, other religions, or the world simply does not occur.

Considering the questions that do not occur to someone like Bryan might help to explain why he finds nothing at all objectionable about the position of George McReady Price, the founder of flood geology and progenitor of “creation science,” outside the mainstream scientific community. As has already been mentioned, Bryan had cited Price as an example of someone who could offer scientific evidence for a young earth, and Darrow took exception to Price’s credentials and position at a relatively unknown college. Responding specifically to the charge that Lodi College’s small size might matter to some, Bryan retorts, “It might raise a presumption in the minds of some, but I think I would rather find out what he believed.” In this statement, Bryan, in his refusal to acknowledge the normal means of assessment practiced by scientists, shows himself to be the common rhetorical ancestor of *many* different movements today united by their common rejection of “official” expertise and the means by which society measures it. Indeed, Bryan has shown himself, throughout the entire subset of his testimony that has been

considered here, to be the prime mover of almost all of the anti-intellectual rhetorical tropes observable in contemporary discourse.

## **Discussion**

The results discussed above illustrate two important aspects of my overall argument. First, they illustrate how the epistemic stance functions as a component of the rhetorical stance by showing how modal verbs can be used to measure the relationship between expressed levels of certainty and broader rhetorical moves. Second, they demonstrate the major difference *between* the epistemic stances offered by the two sides of the Scopes Trial. In doing so, this chapter has helped to prepare the way for the argument that I will develop in the next two chapters: that, by looking at the epistemic stances and rhetorical strategies of the anti-evolution, creation science, and intelligent design movements, we can better understand them *not* as three successive iterations of the same basic idea, but as movements responding to distinct legal and rhetorical environments. While the antievolution movement might serve as a *common ancestor* for both creation science and ID, the latter two movements are best understood as representing two different lines of descent with modification that, despite their common ancestor, now enjoy independent epistemic and rhetorical existences. Furthermore, as I will also show in subsequent chapters, both of the latter movements have produced epistemic and rhetorical offspring of their own that continue to shape the ongoing debate between the different sides of this more particular dispute and, of course, the competing social forces of expert and lay knowledge.

### **Legal Aftermath of the Scopes Trial**

Although Bryan and his fellow anti-evolutionists had won the battle, the war was far from over. For his part, Bryan seemed to be aware of this fact. On account of Darrow's last-minute concessions to the prosecution, Bryan had not had the chance to deliver his closing

argument, a speech which has itself drawn the attention of rhetoricians.<sup>269</sup> To mitigate this fact and restore his reputation, Bryan immediately began to revise this speech for a planned nationwide lecture tour. Unfortunately for the history of American rhetoric, this tour was not to be. Five days after the trial's conclusion – July 26, 1925 – William Jennings Bryan, two-time Presidential candidate and secretary of state, a man known to millions as The Great Commoner and their Peerless Leader, died in his sleep at the age of 65. Millions of people around Tennessee and across the country mourned his passing. Some even attributed Bryan's death to the stress put upon him by Darrow's examination. Knowing Bryan to have been a great eater, Darrow demurred, suggesting that his nemesis had died not of a broken heart but of "a busted belly." Unsurprisingly, these words merely stoked the tempers of Bryan's comrades in the battle against evolution.

Meanwhile, Darrow moved on the appellate phase of the case, where he would see his hopes of taking the issue to The Supreme Court dashed against the rocks of legal technicality. The ACLU, which had been uncomfortable with his involvement in the case from the beginning, sought once again to have him excluded from it. Nor was the press entirely on Darrow's side. An article that appeared in *The New Republic*, for instance, criticized Darrow's behavior during the trial's initial proceedings and argued for the involvement of lawyers from Tennessee. For the next eighteen months, infighting among the defense team and conflict among the state's attorneys alike kept the case alive. When oral arguments finally appeared before the Tennessee Supreme Court in May, 1926, the case had ceased to captivate the country and defense and prosecution alike had grown tired of it. Finally, in an opinion filed on January 17<sup>th</sup>, 1927, The Tennessee Supreme Court, while upholding the constitutionality of The Butler Act, dismissed

---

<sup>269</sup> Michael Hostetler, "William Jennings Bryan as Demosthenes: The Scopes Trial and the Undelivered Oration 'On Evolution'," *Western Journal of Communication* 62, no. 2, (1998): 165-180.

Scopes's conviction, arguing that Raulston had erred in the sentencing phase – the jury, not the judge, ought to have set the penalty. Consequently, the entire affair was rendered legally moot. John Scopes would not have to pay the \$100 fine, and Clarence Darrow would not get to argue the cause of science before the Supreme Court. Unsurprisingly, many were left wondering what the point had been of what the Supreme Court of Tennessee called “this bizarre case.” Indeed, the Butler Act itself would stand for just over 40 years after the truncation of Darrow's appeal.

Throughout the remainder of the 1920s, additional legislation aimed at curtailing the teaching of evolution was introduced in a number of states. By 1929, such legislation had been introduced forty-six times across the United States, even though only three states had passed it.<sup>270</sup> Legal changes less amenable to the anti-evolution movement, however, lay ahead. In 1947's *Everson v. Board of Education*, the Supreme Court incorporated the establishment clause, making it binding on state and local governments.<sup>271</sup> Incorporation also made it possible to challenge anti-evolution laws as unconstitutional establishments of religion, a legal argument that, significant for understanding anti-evolutionism, creation science, and intelligent design as distinct movements, was *not* made during the Scopes Trial. Indeed, incorporation opened the way for the Court to reach this very conclusion in 1968's *Epperson v. Arkansas*. Even before arguments in *Epperson* would be heard, work had been done by Henry Morris, a hydraulic geologist then affiliated with Virginia Polytechnic University, to make George McReady Price's “flood geology,” briefly alluded to by Bryan during his testimony, palatable to a Fundamentalist audience that went beyond Seventh Day Adventists. In the next chapter, I will show how, despite the historical continuities with anti-evolutionism, “creation science,” the major offspring of

---

<sup>270</sup> Frederick Edwards, “Why Creationism Should Not Be Taught as Science: The Legal Issues,” in *Evolution Versus Creationisms: The Public Education Controversy* ed. J. Peter Zetterbeg, (The Oryx Press: Phoenix, AZ, 1983): 362.

<sup>271</sup> *Everson v. Board of Education*, 330 U.S. 1 (1947).

Morris's 1961 book *The Genesis Flood*, is best understood not as a simple reiteration of antievolutionism but as a unique intellectual organism in its own right.

### **The Rhetorical Legacy of the Scopes Trial**

Its legal insignificance notwithstanding, The Scopes Trial was almost immediately represented in popular histories as not only a pivotal event of the 1920s, but also the terminal point for religious fundamentalism in The United States. Nothing, of course, could have been further from the truth when journalist Frederick Lewis Allen published his history of the 20s, *Only Yesterday: An Informal History of the Nineteen Twenties*, a book frequently used as a textbook in American colleges even into the 1980s.<sup>272</sup> Allen portrayed the trial in terms that so magnified the conflict thesis that they might today be considered a caricature even by the conflict thesis's proponents. Bryan was reduced to a bellowing bigot; Darrow was enlarged to a righteous reasoner. Even going beyond the absurd terms in which Allen portrayed the principal characters of the drama, he depicted the entire trial as a scheme on the part of Scopes and Rapalyea to draw some publicity to a town whose populace harbored all the suspicions of "city folk" that an urbane journalist might fear them to have in his darkest nightmares.

Where journalists and historians led, novelists and dramatists often followed close behind. Although other works of similar and lesser popularity recapitulated Allen's take on the trial, the only work to endure longer than his has been Jerome Lawrence and Robert Edwin Lee's 1955 play *Inherit the Wind*, which itself is better known for its 1960 film adaptation. Written with the same aggressive vim with which insensitive Western cartoonists might today depict Muhammed, this heavily fictionalized account has, for many Americans, functioned not only as a metonym for the Scopes Trial – for all they feel they need to know about it – but also as the same

---

<sup>272</sup> Frederick Lewis Allen, *Only Yesterday: An Informal History of the 1920s*, (Harper and Row: New York, 1931): 201-206 discusses the Scopes Trial specifically in the context of the conflict thesis.

for the more general relationship between science and religion. Bryan, fictionalized as “Matthew Brady,” appears as a classic case of Freudian projection. Lacking the intellectual capacity to understand evolution, Brady has undertaken a campaign to defeat it. Similarly appearing in a heroically parodic light, Darrow – the “Henry Drummond” – is portrayed as an uncomplicated champion of science, modernity, and enlightenment. For the 1960s audiences, Scope’s doppelganger Bertram Cate is even given a love interest in the form of the daughter of fiery anti-evolution town preacher Jeremiah Brown. Not even Raulston, who showed surprising restraint and forgiveness with Darrow in the actual trial, escapes the kind of hyperbole that makes it easy to depict the conflict thesis as a position held by all, no matter their stance on evolution. Of course, it would be foolish to fault a dramatist for failing in historical fidelity.<sup>273</sup> That the play’s popularity keeps it on school syllabi and television re-runs, though, perhaps says more about its literary quality than its value as agitprop for the conflict thesis, a position which, by the time of the film’s release, seemed nearly as unassailable as the Butler Act must still have seemed to the people of East Tennessee.

---

<sup>273</sup> Jerome Lawrence and Robert E. Lee, *Inherit the Wind*, (Ballantine Books: New York, 2003).

## Chapter 4

### Counter-Expertise in *McLean v. Arkansas*

Although *Epperson v. Arkansas* may have ended statutes officially prohibiting the teaching of Darwinian evolution, the war for America's classrooms was far from over. Even as broader changes in the American education and judicial system resulted in the eventual defeat of legislation such as the Butler Act, William Jennings Bryan continued to enjoy a number of posthumous local and state victories across the United States. Throughout the late 1960s and the 1970s, opponents of evolution, now calling themselves "scientific creationists" and publicly identified less by their opposition to evolution and more by their support for the Bible's "alternative" story of cosmic and human origins, shifted their legislative agenda and, along with it, their rhetorical strategies. Now, rather than presenting Darwinian evolution as the modern world's paradigmatic threat to Christian hearth and home, advocates of "creationist science" presented evolution as the dominant perspective of a large and monolithic scientific establishment and sought, by appealing to the basic values of fairness and academic freedom, inclusion within the biology curricula of several states. In doing so, they modified the conflict thesis, making it less about a clash between science and religion as basic concepts or worldviews than about a clash between alternative *scientific* perspectives, one of which only *incidentally* provided more support to the worldview of Fundamentalists. Dispensing with outright attacks on the moral implications of evolution and focusing instead of the supposed scientific controversy generated by comparing Darwinian evolution to the Genesis story of creation, these new political agitators sought a narrower goal than an outright ban on teaching evolution. Instead, they sought to achieve "balanced time" for both evolutionary and anti-evolutionary thinking. In this way, they contended, students would be exposed to a healthy scientific "debate," and the state would leave *deciding* the question of human origins to students and their parents. Throughout the

decade following The Supreme Court’s decision in *Epperson*, creationists succeeded in getting textbooks rewritten, material added to curricula, and debates held in state legislatures.

Consequently, the victory in *Epperson* might have been rightly seen – for a time at least – as a classic case of winning the battle while losing the war.

### **Textbook Watchers, Creation Scientists, and the Movement to Legislate Equal Time**

This view might have seemed especially tempting when Arkansas passed Act 590, the “Balanced Treatment for Creation-Science and Evolution Science” Act, in 1981. By the time these bills had been passed, the science curriculum in public schools had been facing renewed challenges to the inclusion of Darwinian evolution for more than two decades. After the Soviet Union’s 1957 launch of Sputnik, The United States had sought to rapidly improve its scientific and technological competitiveness by making broad changes to the science curriculum experienced by most students. The National Science Foundation, consequently, spent a considerable amount of money developing a program tailored to this goal. Despite broad early success, however, the NSF almost immediately encountered local opposition from school boards, where most curriculum decisions are made, with respect to its new biology curriculum. In Florida, Texas, and New Mexico, for example, both school officials and local pastors went to great lengths to mark out diagrams, change language, and place warnings in textbooks in which the discussion of evolution was taken to place the book in conflict with religion, particularly Christianity. In an early example of the kind of tactic that prompted the case to be considered in Chapter Four, New Mexico’s state board of education required textbooks mentioning evolution to be stamped with a warning label “emphasizing that evolution was a theory, not a fact.”<sup>274</sup> The inappropriateness of the fact-theory distinction made here notwithstanding, anti-evolutionists

---

<sup>274</sup> Dorothy Nelkin, *The Creation Controversy: Science or Scripture in the Schools*, (Beacon: Boston, 1994), 46 - 47.

fiercely continued to oppose including Darwinian evolution in American biology textbooks, which, at the 1959 centennial of *The Origin's* publication, remained almost wholly undiscussed in American biology textbooks.

Throughout the 1960s and 70s, attacks on evolution, manifesting what Campell would later call “widespread dissatisfaction with Darwinism as a set of public symbols adequate to employ the drama of living,”<sup>275</sup> became organized opposition to evolution from parent organizations dedicated to “textbook watching,” and formal “research” into what proponents called “creation science,” all of which coalesced into a legislative effort to amend the nation’s science curriculum state-by-state. While the first two methods enjoyed some success, especially in the South and the Sunbelt, it was the latter method that enjoyed the greatest political and legislative success, ultimately becoming the focal point of *McLean v. Arkansas*, the 1981 case considered in this chapter. By deploying the rhetorical tropes of “creation science,” opponents of evolution demonstrated that they had adapted to a legal environment that had changed drastically since the days of the Scopes Trial. With the First Amendment having been incorporated into the states and anti-evolution laws having been officially ruled unconstitutional, these activists, comprised of a triple alliance of ministerial associations, Bible colleges, and parents’ groups, sought to cast the debate as a battle to preserve free *scientific* inquiry against the stifling, dogmatic orthodoxy of “evolutionists,” who had seized control of the institutions of scholarly production and wielded their power to silence any challengers. Similar to the “reverse racism” argument frequently found in discourse about affirmative action, this frame, along with

---

<sup>275</sup> John Angus Campbell, “Creationism: The Argument Time Forgot?” in *Argument in Transition: Proceedings of the Third Summer Conference on Argumentation* ed. by Malcolm Sillars and David Zarefsky (Speech Communication Association: Annandale, VA, 1983): 426. It is worth noting here that Campbell, a rhetorician who frequently published on Darwin and the creation science debate, would later go on to support the intelligent design movement in *Kitzmiller v. Dover*. Currently, he serves on the school board of North Mason County, WA.

the alternative worldview provided by scientific creationism, even allowed its proponents to seize on the now potent mythology surrounding The Scopes Trial. Now, they could claim, the issue was not a matter of the yokels of Dayton convicting sincere-but-unconventional John Scopes for going against the religious majority. They, the *true* scientists, faced an uphill battle against an inquisitorial scientific establishment bent on stopping them and their research not because of its scientific error, but because its correspondence with the Bible threatened the power of the scientific establishment.

At this time, popular attacks on evolution often came in the form of grotesque oversimplification or outright caricature. Formal religious organizations such as the Jehovah's Witnesses, for instance, used their official publications to compare the scientific establishment to a medieval inquisition. Meanwhile, the comic-book style "Gospel tracts" of California-based minister Jack T. Chick lampooned evolution and depicted a professor being bested in a debate with a student over the topic.<sup>276</sup> Within this kind of rhetorical environment, the textbook-watchers and creation scientists flourished.

Textbook watching groups were often comprised of parents who had been upset by what their children had been learning about evolution in school. Beginning in the late 1960s and throughout the 1970s, parent-organized non-profit groups with names like "Educational Research Analysts" monitored the publication of textbooks and lobbied both state boards of education and local school districts to offer "equal time" to evolution and creationism while at the same time acknowledging evolution as a "theory" instead of "fact." These efforts, while

---

<sup>276</sup> See Jack T. Chick, "Big Daddy," <https://www.chick.com/products/tract?stk=55&ue=d>. This tract, first published in 1972, has undergone significant revision since its first publication. It is notable for its depiction of a professor who becomes increasingly agitated by a student's questions until finally admitting that evolution is false and accepting the Gospel. He consequently resigns from the university at which he teaches while facing rejection from his outraged colleagues.

moderately successful in some states, ultimately achieved uneven results. In Texas, textbook watchers succeeded in getting state-approved textbooks to acknowledge that evolution was only a theory and that alternative explanations for the origin of life existed.<sup>277</sup> In 1972, textbook watchers in California, today a state known for its progressive stance toward education, successfully lobbied the California State Board of Education to screen thirty textbooks in the effort to make them “neutral” with respect to the question of origins. Phrases casting doubt on Darwinian evolution were introduced and phrases supporting Darwinian evolution were watered down or removed entirely.<sup>278</sup> Meanwhile, parents across the country and legislators representing states as various as Arizona, Maryland, and Ohio succeeded by 1975 in defunding The National Science Foundation’s recently developed science curriculum, *Man: A Course of Study* (MACOS). Opponents of MACOS such as United States Representative John Conlan, a Republican from Arizona, contended that the curriculum’s representation of humans as animals descended from lower animals offended the Judeo-Christian values of his constituents.<sup>279</sup> While textbook watching groups did not conduct formal research into creation science, they were extremely effective at garnering public support for creation science and, of course at attacking the teaching of evolution. Indeed, it would be the founder of the textbook watching group Citizens for Fairness in Education, Paul Ellwanger, a South Carolina respiratory therapist who, by the time of *McLean*, had more than a decade of anti-evolution activism under his belt, would eventually draft much of what would become Arkansas’s “Balanced Treatment Act.”<sup>280</sup> Had Clarence Darrow still been alive, then, he might have observed that the public discourse as the

---

<sup>277</sup> Larson, *Trial and Error*, 139-145.

<sup>278</sup> Nelkin, 112 - 116.

<sup>279</sup> Ibid 127 - 135.

<sup>280</sup> Larson, *Trial and Error*, 129.

United States entered the 1980s certainly did not augur well for the proponents of “Science” and “Progress.”

Meanwhile, independent research into “creation science” funded by organizations with very scientific sounding names – like the Creation Science Research Center (CSRC) and Creation Research Society (CRS) – began publishing books, producing films, and offering public lectures on the controversy. The former organization was founded by Nell and Kelly Seagraves, the mother-son team leading much of the anti-evolution effort in California.<sup>281</sup> Although older organizations had previously used the term “creation science,” groups like these meant something far more specific than simply finding just any kind of scientific evidence for the Genesis account of creation.<sup>282</sup> The Creation Research Society had initially been founded by Henry Morris, who had published *The Genesis Flood* with his partner John Whitcomb in 1963 as a way to update George McReady Price’s flood geology for a broader Fundamentalist audience than the Seventh Day Adventists. Eventually, the Seagraves recruited Morris to join the CSRS, which at the time operated as a part of Heritage College, a small Bible college in California. Disagreements about how best to promote creation science, however, eventually led Morris to break away from the CSRC and relocate his efforts to Texas, where he founded the Institute for Creation Science, which today remains one of the leading organizations dedicated to promoting its own version of young-earth creationism and attacking evolution.<sup>283</sup> Though mainstream,

---

<sup>281</sup> Ibid, 123.

<sup>282</sup> Numbers, *The Creationists*, 170-175 discusses the Evolution Protest Movement, a British organization that was probably the first to use the term “creation science.” While this group bore some resemblance to later creation scientists in that it sought to claim that modern science supported the Genesis account of creation, it differed in that it did not, as George McReady Price and his followers did, trace nearly all of the scientific proofs for that account to the Noachian flood.

<sup>283</sup> Larson, *Trial and Error*, 128-129.

similar organizations appeared throughout the 1970s. By the time of *McLean*, one such organization, the Genesis School of Graduate Studies, even offered a PhD in creation science.<sup>284</sup>

At the heart of both the textbook watchers' and creation scientists' concerns rested profound disagreements about the role that expertise and experts should play in peoples' lives, especially, just as during the Scopes Trial, with respect to the perceived moral and social implications of teaching evolution. Twentieth century scientists, operating on the assumption that disputes in science education should be solved the same way as disputes in science – that is, by professionals – found themselves baffled by the ways in which they were portrayed and by the consequent calls for “equal time” for creation science that emerged throughout the locales just mentioned. To them, “only collegial acceptance can validate one theory and reject another; the views of those outside the community are irrelevant.”<sup>285</sup> That President Ronald Reagan had voiced support for “equal time”<sup>286</sup> and a national poll conducted by NBC news showed 76% of those surveyed in support of equal time<sup>287</sup> ultimately mattered little for whether or not an idea could be considered “scientific” for the purpose of being taught in a public school. This position, predicated on the extreme specialization of contemporary academic disciplines, entails a sharp distinction between the expert and the non-expert and a consequent deference to the expert on the part of the layman. Were this last part not the behavioral terminus of this idea, perhaps the conflict would not exist. But opponents of evolution evaluate the scientific merit of the theory not its biological coherence, but on what they take to be its moral and political implications. Shifting the rhetorical and therefore the evidential ground, a dispute to be held among specialists becomes a question of general concern, one in which all opinions must be heard equally for the

---

<sup>284</sup> Nelkin, 83.

<sup>285</sup> Ibid, 186

<sup>286</sup> Larson, *Trial and Error*, 126

<sup>287</sup> Nelkin, 144-145.

debate to “count.” Recall that William Jennings Bryan opposed the introduction of expert witnesses into the Scopes Trial on similar grounds, though, and this position will seem like the most current iteration of an old stance.

The earliest efforts to legislate “equal time” began in the early 1970s and met, at first, with considerable difficulty on account of the often overtly religious language, including direct references to the Bible, that featured in such bills. By the end of the decade, scientific creationists had realized that they would need to be able to articulate their ideas in language that could pass the Lemon Test, which the Supreme Court had just promulgated as a result of 1971’s *Lemon v. Kurtzman*. Working to meet this challenge, Wendell Bird, who had joined the Institute for Creation Research after graduating from Yale Law School, updated the Institute’s resolution on equal time so that scientific creationists were confident it could pass the scrutiny of the Lemon Test. Since Bird had previously won a prize for a Yale Law Review article defending the teaching of creation science, his addition to the ICR’s team gave higher-ups like Morris and Gish many reasons to feel confident in their crusade. Shortly after the Institute began promoting the resolution in 1979, it drew the attention of Paul Ellwanger.<sup>288</sup>

Using Bird’s resolution, Ellwanger drafted the model legislation that would become Arkansas’s Act 590, “The Balanced Treatment for Evolution-Science and Creation-Science Act.” After Ellwanger shopped the bill around to two different state senators,<sup>289</sup> the act was introduced into the Arkansas State Senate on February 24, 1981. In a victory for the much-praised contemporary value of “bipartisanship,” after little debate in either chamber of the state’s

---

<sup>288</sup> Larson, *Trial and Error*, 149-150.

<sup>289</sup> See Matthew McNair, “Rhetorical Continuity: Evolution, Creation Science, and Intelligent Design,” in *First Amendment Studies in Arkansas* Ed. by Stephen Smith (University of Arkansas Press: Little Rock, 2016): 237-238 for a discussion of the Act’s history that includes the author’s personal interviews with a number of key players in *McLean*.

Democrat-controlled legislature, Republican Governor Frank White signed the bill into law on March 19, 1981, not even a month after it had been introduced. Act 590 required that “public schools within this State shall give balanced treatment to creation-science and to evolution-science.”<sup>290</sup> While the legislature’s apparent need to append the word “science” to the words “creation” and “evolution” stands out, how the term “balanced treatment” is defined seems of particular note.<sup>291</sup> While the Act did not “require any instruction in the subject of origins,” it did require that that “instruction in both scientific models (of evolution-science and creation-science) if public schools choose to teach either.”<sup>292</sup> Put simply, Act 590 gave creationists a two-pronged victory. Whenever Arkansas schools wanted to include evolution in the curriculum, creation science had to be included *as if it were the only possible other model* of origins. At the same time, the controversy generated by teaching evolution at all or by teaching creation science alongside it might make many school administrators and teachers feel so intimidated that they avoided the subject altogether. In either situation, the Act effectively banned a strictly scientific discussion of evolution from the biology curriculum.

### **Creation Science and the Rhetoric of Demarcation**

Owing to the incorporation of the First Amendment and the outlawing of anti-evolution statutes, the rhetoric of creation scientists and their critics represents a significant shift in the argumentative grounds relevant to the topic. No longer able to appeal to directly to evolution’s purported conflict with religion and the moral values it inculcates, creation scientists had to criticize evolution from within the scientific paradigm out of which evolution emerged and

---

<sup>290</sup> 73<sup>rd</sup> General Assembly, State of Arkansas. “Act 590 of 1981.” In *Creationism, Science, and the Law: The Arkansas Case* ed. by Marcel C. La Follette, (The MIT Press: Cambridge, MA, 1983), 15.

<sup>291</sup> Indeed, Larson, *Trial and Error*, 151, notes that adding the word “science” to the terms “creation” and “evolution” seems to be the only substantial difference between Bird and Ellwanger’s model legislation and the law that Arkansas actually passes.

<sup>292</sup> “Act 590 of 1981,” La Follette, 17.

which, by the middle of the 20<sup>th</sup> century, it supported. In a retrospective look at the shift from antievolutionism to creation science to intelligent design, Guy Haarscher describes this shift in terms as an example of Perelman's concept of "pseudo-argument," an argument advanced by someone who does not necessarily sincerely hold its premises. With respect to the debate over creation science and evolution, Haarscher notes, "the debate was less and less between reason and dogmatic religion, or between free examination and argument of authority. It was transformed—and disguised—into a debate that was supposed to be taking place inside the liberal-democratic sphere of legitimacy."<sup>293</sup> This situation put the burden of proof onto creation scientists, who had to show both that their arguments "counted" as science and that they were not religious.

Indeed, despite their disagreements about Act 590, both sides of what would become *McLean v. Arkansas* used the god term "science" to ground their discussion of the case's facts and, more specifically, their characterization of themselves and their opponents in conceptual territory as old as Plato's *Gorgias*. Deploying the central trope of the conflict thesis, the conflict between rational, empirical science and dogmatic, emotional religion, both sides attempted to portray themselves as the defenders of scientific truth and their opponents as representative of a blind, religious orthodoxy. On the one hand, defenders of evolution pointed to the practically universal acceptance of the evolution on the part of biologists and characterized creation scientists as not even doing real scientists. Creation scientists, on the other hand, portrayed evolutionary theory as a stealth form of the religion they called "secular humanism," which had been so long established in the public schools by evolutionary theory that it was no longer even

---

<sup>293</sup> See Guy Haarscher, "Perelman's Pseudo-Argument as Applied to the Creationism Controversy," *Argumentation* 23, no. 3 (2009): 365. Pseudoargument does not necessarily entail hypocrisy or insincerity. Judges, for instance, must reason within accepted legal premises, even applying laws with which they personally disagree.

recognized as such. Creation scientists likewise portrayed biologists supportive of evolution as dogmatically committed to the materialistic philosophy, and its consequent moral implications, entailed by the “religion of secular humanism.” These contrasting characterizations notwithstanding, however, Smout observes that the adoption of this basic rhetorical frame, where one side stands with “truth” and the other with “error” contributed to *McLean v. Arkansas*’s becoming a case focused on the demarcation question.<sup>294</sup> For, when neither side disagrees about the value or the authority of a god term like “science”, yet each side claims to represent science, the most natural solution seems to be to simply ask the fundamental definitional question. At the same time, Smout goes on to observe, “within our current legal system and our culture of disciplinary communities, defining key terms is, finally, a political act by the basic values and beliefs of the definer.”<sup>295</sup> Obvious as this notion might seem to readers in a “post-truth” era, Smout correctly understands the stakes of these questions with respect to expert testimony as a species of evidence. For, when the definitions of key terms and the demarcation between disciplines commensurate with them becomes such an explicitly political act,<sup>296</sup> studying the rhetoric by which such demarcation is achieved becomes both the means and the material for understanding the rhetorical background to legal controversies.

Through organizations like the ICR, scientific creationists had long exploited disparities between the popular and technical understanding of science in general and evolution in particular to cast doubt on evolution as an explanation for human origins. In doing so, they sought to make way for the “creation model,” revealed by a typically unidentified (though sometimes and

---

<sup>294</sup> Smout, 105-106.

<sup>295</sup> Ibid, 180.

<sup>296</sup> Those interested in stridently maintaining the neutrality of “science” as such a term might be interested in the post-trial debate between Michael Ruse and Larry Laudan. Ruse, who had been criticized by Laudan for the conceptual flimsiness of his demarcation criteria, appeals to the immediate, pragmatic need to defeat creation scientists in defending the criteria he supplied to Overton.

significantly identified specifically as the God of the Bible), generalized “creator,” a thesis for which, they argued, abundant scientific evidence had been left behind. Creation scientists’ exploitation of popular ignorance of scientific concepts found particular expression in their assertion that, whereas evolution was only a theory, the creation model enjoyed the support of a much broader range of undisputed scientific facts. As Duane Gish, famously willing to publicly debate evolutionists and consequently one of the most visible scientific creationists, argued, using no less than a popular source than an appeal to the *Oxford English Dictionary*, “for a theory to qualify as a scientific theory, it must be supported by events or processes that can be observed to occur, and the theory must be useful in predicting the outcome of future natural phenomena.”<sup>297</sup> On these grounds, Gish argued that, because no one has ever observed one species transform into another and, due to the amount of time that would be required to do so, no one ever *can* observe one species transform into another, evolution becomes disqualified as “science” purely as a matter of definition.

Drawing from Willim Jennings Bryan’s tried-and-true playbook, creation scientists turned to the public, rather than to scientists, to make their case. In books such as Morris’s *Scientific Creationism* and Gish’s *Evolution: The Fossils Say No!*, not to mention lectures, pamphlets, and public debates, creation scientists typically deployed one or several of seven basic arguments designed to illustrate the weakness of evolution and to support the “creation model.” First, appealing to an extremely simplified version of physics, they claimed that both the First and Second Laws of Thermodynamics suggested the sudden creation of the universe. They supplemented this claim with the further claim that *life*, owing to its sudden appearance in “complex forms” in the fossil record, was suddenly created. Further noting that genetic variation

---

<sup>297</sup> Duane Gish, “Creation, Evolution, and the Historical Evidence” in *But Is It Science* ed. by Robert Pennock and Michael Ruse, (Prometheus Books: Amherst, NY, 2009), 232.

has occurred only within the limits of originally created “kinds” and that random mutation and natural selection seem mathematically impossible, even given billions of years, of producing the complexity of presently existing organisms, they contend that evolution must be impossible. Adding to that the separate ancestry of men and apes, the geologic evidence for catastrophism, and the earth’s “recent” inception, they finally conclude that “there is scientific evidence for creation from cosmology, thermodynamics, paleontology, biology, mathematical probability, geology, and other sciences.”<sup>298</sup> Of particular interest to rhetoricians and linguists, scientific creationists appealed specifically to linguistic evidence in order to argue against evolution. Pointing to the Genesis tale of the Tower of Babel, which depicts how, a few generations after the Noachian, God divided the single language spoken by the whole human race into the multiple languages now spoken today as a punishment for its hubris in attempting to build a tower tall to reach heaven.<sup>299</sup> Speaking a single language, of course, required that the entire human race be gathered into more-or-less the same place, which could not have been the case if the models of population migration suggested by evolutionary biology are true. Despite the enumeration of claims, with one writer even claiming to offer more than a hundred categories of evidence against evolution,<sup>300</sup> all of these claims boiled down to a simple proposition: in order for

---

<sup>298</sup> See Duane Gish, Richard Bliss, and Wendell Bird, “Summary of Scientific Evidence for Creation,” in Zetterberg *Evolution versus Creationisms*, 199-207. This essay, originally printed as a pamphlet and intended for popular distribution, exemplifies the arguments developed at greater length in the books of Morris, Gish, and others associated with their movement.

<sup>299</sup> See C.F. Hockett, “Language and Scientific Creationism,” *Forum Linguisticum* 8, no. 1 (1984): 59-68 for a discussion and refutation of the linguistic evidence against evolution offered by Henry Morris in *Scientific Creationism*. The author of this article had originally been slated to testify as an expert by the plaintiff’s legal team, but it was eventually determined that his testimony would not be needed. This article offers a useful condensation of what Hockett’s testimony would have been had ultimately taken the stand.

<sup>300</sup> Walter T. Brown “The Scientific Case for Creation: 108 Categories of Evidence,” in Zetterberg *Evolution versus Creationism: The Public Education Controversy*, 199-207, offers an especially scholastic attempt to buttress creationism by attacking evolution.

evolution to be true, the Bible would have to be wrong. Since the Bible cannot be wrong, evolution must be false.

Each of these claims, they contended, were born out by both the empirical scientific evidence and the legal prescriptions of the US Constitution so that, at least to them, the constitutional *necessity* of teaching the creation model alongside evolution seemed obvious. In a similar way, each claim depended upon an appeal to what has been called “a folk epistemology of common sense empiricism” that makes no distinction between the trained eye of a scientist and the judgment of the layperson.<sup>301</sup> Within this framework, popular consensus becomes the deciding factor in what “counts” as science, and Americans’ tepid acceptance of evolution proves its doubtful worth and, conversely, the need for equal time for creation science. At the same time, such an epistemological gave creation scientists a convenient explanation for perhaps the most glaring problem with their rhetoric and their agenda: the overwhelming rejection of both by the scientific community. Their linguistic arguments, too, were rejected for failing to account for the vast linguistic diversity observable in the ancient world.<sup>302</sup>

This response to all seven of the creation scientists’ main arguments became especially fervent after creation scientists and textbook watchers started working to influence state legislatures. Since many creation scientists, Gish and Morris included, boasted advanced degrees in scientific subjects, they could not be dismissed as easily as H.L. Mencken’s caricature of the backwoods yokel that had so suffused the discourse surrounding the Scopes Trial. Thomas Lessl compares the scientific community’s response to how the Catholic Church dealt with internal controversies between orthodox and heretical theological views. Just as the Church recognized a state of crisis, initiated a struggle for authority, built solidarity within its ranks, articulated

---

<sup>301</sup> Michael Cavanaugh, “Scientific Creationism and Rationality,” *Nature* 315, (May 16, 1985): 189.

<sup>302</sup> Hockett, 66.

boundaries, and engaged in ritual denunciation of “heretics”, so too did the scientific community with creation scientists.<sup>303</sup> Where creation science had been previously ignored by the scientific community, between the late 1970s and 1983, more than 60 articles denouncing creation science and scientists appeared in scientific magazines and periodicals, and at least nine books appeared on the topic, frequently depicting the creation science controversy as a crisis of lax educational standards and depicting creation scientists, who were often depicted as wanting to take society back to the Middle Ages, as potential competitors for research funding.<sup>304</sup> The ensuing struggle for authority prompted a number of assertions of not only *who* could count as a scientist but also *what* could count as science. Relevant to this boundary work, the demarcation question between “science” and “non-science,” a question that orthodox scientists used to exclude creation science from the disciplinary environs of science, became the central question for which Judge Overton in *McLean* would later rely upon expert witness testimony. Prelli discusses this boundary work specifically with respect to how the plaintiffs in *McLean* used expert witnesses to determine who counts as a scientist and what counts as science. More particularly, they contended that creation scientists “were not real scientists” and that their “postulates did not constitute reasonable scientific claim-making.”<sup>305</sup> With respect to the first claim, plaintiffs demonstrated that, despite their “credential-mongering,” creation scientists did not publish in respected scientific journals, did not participate in the peer review process, and were not employed or affiliated any of the world’s major scientific institutions.<sup>306</sup> The latter claim was pursued, somewhat problematically, by appeal to Popper’s falsifiability criterion, about which more will be said later in this section.

---

<sup>303</sup> Thomas Lessl, “Heresy, Orthodoxy, and the Politics of Science,” *Quarterly Journal of Speech* 74, no 1. (1988): 18-34.

<sup>304</sup> *Ibid*, 23.

<sup>305</sup> Lawrence Prelli, “Creationism and the Rhetoric of Science,” in *A Rhetoric of Science: Inventing Scientific Discourse* (Columbia: University of South Carolina Press, 1989), 221.

<sup>306</sup> *Ibid*, 222.

In any case, identifying a crisis and demarcating science from non-science, combined with the ritual denunciation of creation scientists and their motives, built solidarity within the scientific community, though some, such as Stephen Jay Gould, who testified at the *McLean* trial, recognized the essentially rhetorical and performative nature of these moves.<sup>307</sup>

While one might expect rejection on the part of the scientific community to have caused creation scientists to revise their views and the public to reject them, the opposite proved to be the case. Rejection simply fueled creation scientists' sense that they were playing a game rigged by opponents bludgeoning them with a hostile materialist philosophy. As Charles Alan Taylor observed, "creationism endures not only *in spite of* the response from the traditional scientific community, but also, in part, *because of* that response."<sup>308</sup> This was because, as he argued, creation science's fundamental appeal to popular audiences presupposes their own "mistrust of detached technical expertise."<sup>309</sup> Appealing to a Baconian notion of induction entailing that science involves nothing but logic applied to observation, however trained the observer, creation scientists espouse an epistemic egalitarianism that ranks conclusions of a scientist with a PhD no higher than those of a high school student unfamiliar with elementary biology or geology. Simultaneously, they "exploit this surface-level egalitarianism with their oft-repeated charges that their 'outsider' status vis-à-vis the traditional scientific community is a function of the myopic oppression of an elitist cadre of humanist evolutionists."<sup>310</sup> Recognizing the value of these appeals helps to explain why so many Americans held views sympathetic to creation science despite its failure to make headway in the scientific community.

---

<sup>307</sup> Lessl, 27-29.

<sup>308</sup> Charles Alan Taylor, "The Rhetorical Construction of Science and Creation Science." in *Defining Science: A Rhetoric of Demarcation* (Madison: The University of Wisconsin Press, 1996), 140. An earlier version of this chapter was published by Taylor as "Of Audience, Expertise, and Authority: The Evolving Creationism Debate," *Quarterly Journal of Speech* 78 (1992): 277-295.

<sup>309</sup> *Ibid.*

<sup>310</sup> *Ibid.*, 152.

Scientific creationists also exploited ambiguities within the very disciplinary boundary work that their claims had prompted from the scientific community. Popper's falsifiability criterion stands out as the most obvious and the most prominent. Though scientists and judges alike frequently appeal to falsifiability to distinguish science from non-science, "there are," Prelli observes, "no universal demarcation criteria."<sup>311</sup> Furthermore, To creation scientists' delight, Popper had once referred to Darwinian evolution as "a metaphysical research programme" that could never be scientifically verified.<sup>312</sup> Although Popper himself later clarified his remarks to position himself more in support of evolution as a scientific hypothesis, "what is crucial here," as Taylor puts it, "is that Popper's formulation was drawn upon in diametrically opposed contexts."<sup>313</sup> On the one hand, mainstream scientists (and later Judge Overton in *McLean*) would rule creation scientists non-scientific by appealing to falsifiability. On the other hand, creation scientists would appeal to the falsifiability criterion to reject the scientific nature of evolution, and from there they would position the defenders of evolution as an entrenched orthodoxy for purposes of the rest of their persecution narrative. The result was a net win for creation scientists, for they could always argue that if creation science ought not to be taught because it cannot be falsified, then *neither* should evolution be taught. Their mischaracterization of the falsifiability criterion, of course, did not make much of a difference because they sought, as has been previously noted, to persuade popular audiences even at the expense of, and at times in preference to, persuading expert audiences.

---

<sup>311</sup> Prelli, 229.

<sup>312</sup> Karl Popper, "Darwinism as a Metaphysical Research Programme," in *The Philosophy of Karl Popper* ed. by Paul Schlipp, (La Salle, IL: Open Court, 1974), 133.

<sup>313</sup> Taylor, 165.

### Synopsis of the Trial

In an ironic turn against the creation scientists, the lawsuit filed against Arkansas by the ACLU two months after Governor White signed Act 590 named Little Rock pastor Bill McLean and the local leaders of the United Methodist, Episcopal, Roman Catholic, African Methodist Episcopal and Presbyterian churches as its plaintiffs. Reporters from across the country flocked to Little Rock, quickly christening *McLean v. Arkansas* as *Scopes II*, though the course of the trial showed that designation to be premature at best and of dubious worth at worst. As members of the media and citizens of the country soon learned, a civil case focused largely on a technical issue like the demarcation criterion could not hope to equal the drama of Scopes's criminal trial. Similarly, the trial featured nothing like the drawing power of Clarence Darrow or William Jennings Bryan. Instead, a team comprised of largely unknown attorneys from the ACLU, New York, and Little Rock itself labored with competence that can probably only be attributed to its obscurity against Arkansas's Board of Education and its Attorney General, Steve Clark.<sup>314</sup>

After six months of legal wrangling, the trial, which lasted from the 7<sup>th</sup> to the 17<sup>th</sup> of December, finally began with the eyes of the national media upon Little Rock. The ACLU, relying on the expert testimony of philosophers, theologians, and scientists alike, worked from the beginning to make the trial less about the scientific merits of creation science and more about its basic status as science. Put simply, the plaintiff's legal team contended that creation science's basic commitment to the Genesis account of creation, and in particular to the special significance that it afforded to the Noachian flood, revealed Act 590's essentially religious nature. More specifically, the Act's legislative history, which reveals that it was intentionally drafted "to avoid First Amendment strictures," linked both it and creation science as a concept to the more general

---

<sup>314</sup> Larson, *Trial and Error*, 160.

history of American Fundamentalism. Consequently, the Act failed to meet the “primary effect” prong of the Lemon Test and created a state establishment of religion in violation of the First Amendment.<sup>315</sup>

The defendants, assisted by their own experts, made many of the claims surveyed in the previous section. Particularly, they relied on the argument previously laid out by Bird, who, by the time the trial began, had begun to lose confidence in the case,<sup>316</sup> in his famous law review article. Act 590, they contended, had “the primary effect of furthering academic freedom” because creation science, although controversial, constituted a legitimate scientific theory. Because competent, credentialed scientists considered creation science to be scientific, proscribing it from the science classroom violated the rights of individual instructors to use their discretion in determining what to teach, and it violated students’ right to hear “both sides” of the scientific controversy over “origins.”

With the plaintiffs denying that such a controversy even existed, both sides arguments’ established demarcation criteria as the trial’s central dispute. These questions, typically, and perhaps fortunately, confined to disputes between philosophers of science, took on added significance not only because of their centrality to the secular purpose prong but also because of the general authority then afforded to science and scientists. The “most fundamental” of these questions, according to plaintiffs’ attorneys Eric Holtzman and David Klasfeld, became a dispute

---

<sup>315</sup> See Mark E. Herlihy, “Trying Creation: Scientific Disputes and Legal Strategies,” in La Folette, *Creationism, Science, and the Law*, 97-100. Herlihy, then an associate at the New York law firm Skadden, Arps, Slate, Meagher, and Flom, assisted in arguing the plaintiff’s case at the trial. The primary effect prong, discussed in chapter one, says that a statute’s primary effect should neither advance nor inhibit religion.

<sup>316</sup> More specifically, Bird had offered his services to Clark as a member of the legal team, but Clark had refused him. This led to Bird to disparage Clark and his ability to defend Act 590 both in private and in public. Bird even went so far as to dissuade one of Clark’s defense experts, who had traveled to Little Rock for the trial, to leave without taking the stand.

over “who should decide what is to be taught as *science* in schools.”<sup>317</sup> While the plaintiffs’ contention that these questions should be determined by practicing scientists might seem obvious to today’s audiences, the contemporary attractiveness of the defendants’ attack on Popper’s falsifiability criterion and the intuitive and the commonsense appeal of their democratic arguments to fairness and academic freedom should not be underestimated.<sup>318</sup> To make such determinations, and as if to show how far all involved had come since Judge Raulston’s exclusion of expert testimony from the Scopes Trial, both legal teams turned to expert witness testimony.

While plaintiff and defense experts agreed that science *could* be adequately demarcated from religion,<sup>319</sup> they disagreed about how to do this and, most importantly, about whether Act 590 consequently constituted an Establishment Clause violation. One way to describe the difference between the criteria offered would be that the plaintiffs offered criteria grounded in *logos*, while the defense team offered criteria grounded in *ethos*. The plaintiffs’ experts, divided into a “Science” team and a “Religion” team argued that, because creation scientists’ claims did not appeal to natural laws and could not be explained by material causes, tested, or repeated, they did not constitute science. Furthermore, because creation scientists published their claims in private journals rather than the journals publicly recognized by scientists, they were attempting

---

<sup>317</sup> See Eric Holtzman and David Klasfeld, “The Arkansas Creationism Trial: An Overview of the Legal and Scientific Issues,” in La Folette, *Creationism, Science, and the Law*, 86.

<sup>318</sup> For perhaps the most detailed look at the relevant philosophical questions raised by creation science with respect to *McLean*, see Phillip Bashor, “Creation-Science Rhetoric: A Philosophical Examination,” *Philosophy Research Archives* 14 (1988-89): 489-515. For a specific discussion of creation scientists’ appeals to fairness, see pp. 498-499 of the same.

<sup>319</sup> Indeed, the presumption that “scientific” claims can be more-or-less precisely demarcated from “religious” in a way that roughly corresponds to empirical reality is an important assumption shared by both sides of this case. Both this assumption and the specific demarcation criteria discussed in the case, particularly those offered by plaintiff expert Michael Ruse, faced philosophical criticism in the aftermath of *McLean*. See Larry Laudan, “The Demise of the Demarcation Problem,” in Pennock and Ruse, *But Is It Science?*

to circumvent the process by which scientists “did” scientists.<sup>320</sup> Moving away from demarcation as such, defense experts argued, even if creation scientists’ claims met any of these criteria, the specific legislative history of Act 590 revealed the obviously religious motives of the Act’s drafters and the legislature that had passed it. Taken together, these contentions left the state encumbered before the attorney general even had the chance to make his case.

The defense experts responded with few specific demarcation criteria and many appeals to the credentials of creation scientists. Whatever the plaintiffs’ experts contended about creation scientists’ claims, nobody disputed that they *were* scientists. If a scientist could accept creation science, then, by default the theory became scientific.<sup>321</sup> Act 590, then, had the secular purpose of advancing academic freedom by ensuring that students had access to a competing scientific theory of human origins. Significantly, defense experts, who were led by theologian Norman Geisler, who caused a minor scandal by admitting under cross-examination his belief in a Satanic origin for UFOs, did not dispute creation scientists’ failure to publish in established scientific journals. Instead, they contended that the materialistic biases of the prevailing scientific establishment led to biases among journal editors that caused them to reject the work of creation scientists despite its obvious merit. Resting as they did on conjecture and conspiracy, though, these claims failed to impress Judge Overton as much as they had failed to impress the scientific community.

### **Preparing and Analyzing the Corpus**

---

<sup>320</sup> Publicly made claims subject to natural law, material causality, testability, and repeatability became the “five essential characteristics of science” appealed to by Judge Overton in his rejection of Act 590. These characteristics were most specifically the contribution of philosopher Michael Ruse, whose testimony will be examined in this chapter’s next section.

<sup>321</sup> This claim is, perhaps not insignificantly, still frequently made by young Earth creation science proponents. In a 2014 debate against Bill Nye the “Science Guy,” Ken Ham begins his opening statement by attempting to refute the contention that “if you believe in creation, you can’t be a scientist.” See “Bill Nye Debates Ken Ham,” *YouTube*, 2014, <https://www.youtube.com/watch?v=z6kgvhG3AKI>.

Since Arkansas did not appeal Overton’s decision, a complete transcript of expert witness testimony for *McLean v. Arkansas* was never prepared by the court. Although nearly complete transcripts of the plaintiff’s testimony have been recovered, it is likely that many of the transcripts of defense’s expert witness testimony, originally stored in a printed format, have been lost or have decayed over time.<sup>322</sup> A complete study of the expert witness testimony in this case, apart from being more time and space consuming than this project allows, also seems unlikely to be possible. Fortunately, complete transcripts of the testimony of each team’s lead witnesses have survived. For the plaintiffs, philosopher of biology Michael Ruse, whose work on the creation-evolution debate has been cited extensively throughout the present work, testified to the five essential characteristics of science that Overton would later cite in his decision striking down Act 590. Through Ruse’s testimony, technical conclusions reached by philosophers became, in a sense, legally binding on the people living in the Western District of Arkansas. Given how little the general public knows about or pays attention to the technical debates of philosophers, this apparent discrepancy between the actual rules that govern Americans’ lives and their awareness of them can be viewed with no small amount of amusement. To speak more seriously, though, Ruse’s testimony provides a compelling example of arguments moving from, to use Goodnight’s language, the “technical” to the “public” spheres. Turning to the arguments offered by Norman Geisler, the theologian who served as the defense’s lead expert witness, an attempt to achieve the reverse form of argumentative movement can be observed. Had they won the case, creation scientists would have effectively taken arguments that originated in the public sphere and then, by means of the courts, imposed them on the technical sphere. Although they

---

<sup>322</sup> See “The *McLean v. Arkansas* Documentation Project”, [http://www.antievolution.org/projects/mclean/new\\_site/index.htm](http://www.antievolution.org/projects/mclean/new_site/index.htm), for a discussion of efforts to obtain and preserve transcripts of the trial.

failed, this observation helps to contextualize the purposes of such rhetorical moves as the suggestion that creation scientists have been excluded by a scientific elite who feel their materialistic philosophy threatened.

Although I was able to obtain transcripts of Ruse's and Geisler's testimonies, I did not acquire them from the same source. The transcript of Ruse's testimony was made available online by The *McLean v. Arkansas* documentation project in 2005,<sup>323</sup> and so, making small corrections to obvious typos and removing formatting issues that would interfere with the text's ability to be read by AntConc, I converted the transcript into a plaintext format. Transcripts of Geisler's testimony, however, have not been obtained by The *McLean v. Arkansas* documentation project. To obtain a transcript of Geisler's testimony, I had to turn to Geisler's 2007 book *Creation and the Courts: Eighty Years of Conflict in the Classroom and the Courts*. In this book, which published his transcript for the first time, Geisler complains of the trouble he himself had in obtaining a transcript of his testimony. Indeed, the chapter containing his testimony's transcript is titled "The Testimony They Refused to Transcribe."<sup>324</sup> Since Geisler's transcript was only available in print or in digital formats that were not machine readable, I transcribed the testimony from the printed page into a plaintext document, just as I had for Metcalf and Bryan's testimonies in *Scopes*. The transcript printed in Geisler's book includes corrections of typographical errors, which Geisler notes in brackets. To create the most accurate representation of the spoken testimony possible, I have transcribed Geisler's corrections, where they seem to be obvious corrections to spelling or punctuation, into the text that I have analyzed. I have, however, noted in my transcription where I have done this. Although this took time, I was

---

<sup>323</sup> Perhaps not unsurprisingly, this was about the same time that *Kitzmiller v. Dover*, the case that I will consider in the next chapter, was being litigated.

<sup>324</sup> The full transcript that I worked from can be found in Norman Geisler, *Creation and the Courts: Eighty Years of Conflict in the Classroom and the Courtroom* (Wheaton, IL: Crossway, 2007): 147-182.

able, in the end, to analyze the complete direct testimony of the lead expert witness from both sides of the case. Although I then followed the same procedure outlined in chapter two, a few distinctions between the content of the expert witness testimony in *McLean* and that of Scopes should be noted before proceeding to the results. Ruse and Geisler's testimonies feature a number of speech-turns in which they are reading from books. In some of these speech-turns, modal verbs occur. Because these occurrences involve the quotation of others' words, I chose not to include them in my final tally of the number of modal verbs spoken by each witness, even though they were registered by AntConc. The number of such excluded instances will, however, be noted in the overview of each witness's testimony. This problem did not present itself in the Scopes Trial's testimony, but it will recur in chapter four, when the testimony given in *Kitzmilller v. Dover* is considered.

### **Results**

The testimony of Michael Ruse, then a Professor of the History and Philosophy of Science, now the Lucyle T. Werkmeister Professor and Director of the History and Philosophy of Science Program at Florida State University, formed the cornerstone of the plaintiff's expert witness evidence. Ruse offered five general demarcation criteria for scientific statements—an explanatory basis in natural law, a reliance natural methodology, empirical testability, tentativeness, and falsifiability. He also testified that he did not believe creation science met any of these criteria. Going a step further, Ruse concluded his testimony by opining that creation science not only failed to meet his five criteria, but that it also seemed to be religion. This testimony devastated the defense's case and, going on to be cited several times in Judge Overton's written decision, also informed the court's decision perhaps more than that of any other witness.

Ruse’s testimony consisted of 8,228 word tokens expressed in 1,279 unique words. Of the word tokens in Ruse’s testimony, 92, approximately 1.1% of the total number of word tokens were instances of the eight modal verbs capable of being used epistemically. Slightly more than half of these word tokens, 56 (only 0.06% of the total number of word tokens), were ultimately coded as being used epistemically. In total, 29 unique verbs were modified across all epistemic uses of modal verbs. A complete overview of modal verb usage in Ruse’s testimony can be found in the table below. In it, the rhetorical balance of the expert stance can also be seen. While 29 of Ruse’s statements are modalized for possibility and 27 for necessity, neither epistemic sense totally predominates. This stands in contrast with the anti-expert stance of William Jennings Bryan, where the sense of certainty dominates, and the para-expert stance of Michael Behe, where the sense of possibility dominates.

**Overview of Modal Verb Usage in Michael Ruse’s Testimony**

Word Token Frequency Rank	Modal Verb	Number of Word Tokens	Epistemic Uses	Number of Unique Verbs Modified in Epistemic Uses	Unique Verbs Modified in Epistemic Uses
---------------------------	------------	-----------------------	----------------	---	---

1	would	37	17	13	say, show, count, falsify, make, see, use, think, find, feel, want, be, have
2	can	19	15	11	stop, say, infer, see, find, get away from (negated), give, get, explain, think
3	could	11	9	5	count, be, go back to, say, have
4	might	7	5	4	start, have, say, happen,
5	must	7	3	1	be
6	will	6	6	6	hear, take, quote, notice, mention, see
7	should	2	1	1	have
8	may	0	0	0	none
<b>Totals</b>	–	92	59	29	say, show, count, falsify, make, see, use, think, find, feel, want, be, have, stop, infer, get away from (negated), give, get, explain, think, count, go back to, start, happen, hear, take, quote, notice, mention

The verb variety in Ruse’s testimony included many verbs specific to debates over demarcation, such as “falsify.” Ruse’s testimony also stood out for the total absence of “may,” the modal that expresses the lowest degree of certainty. The *kinds* of verbs Ruse used likewise stands out, as much for what does appear as what does. For while modalized verbs appear in both transitive and intransitive constructions, *all* of the verbs that Ruse modalized referred to either

mental actions or processes. As has been noted in earlier chapters, experts are frequently distinguished from laypeople by both the kinds of arguments they make and the higher level of abstraction with which they make such arguments. The correlation between modalization and abstraction, then, seems an important component of the expert ethos. Just as important, an expert witness can, whether Ruse did or not, consciously perform with this correlation in mind.

Despite this fact and the position of “would,” a modal conveying near-certainty, as the most frequently used individual modal, 28 modals conveying a lower degree of certainty, nearly 50% of the total number of epistemic modals used, also appeared in Ruse’s testimony.

### **Would**

Three rhetorical features— the articulation of demarcation criteria, the explication of Act 590, and the characterization of creation science as religion – stand out among Ruse’s seventeen epistemic uses of “would”. Unsurprisingly, the articulation of demarcation criteria, among them the much-disputed falsification criterion, functions as the foundation of Ruse’s testimony. Ruse’s two other rhetorical strategies depend upon his more basic establishment of demarcation criteria, for support of which he appeals predominantly to Popper. Epistemic “would” proves especially useful when Ruse wants to attribute hypothetical statements to others, a grammatical choice that allows him to express his opinion through more apparently neutral third-person constructions as opposed to more obviously subjective first-person constructions. Ruse especially deploys such constructions to establish demarcation criteria or attribute motives to creation scientists.

Combined, these rhetorical strategies and grammatical constructions allow Ruse to speak as though he is not even expressing an opinion at all, reinforcing his epistemic stance as a voice of objective, disinterested science. Although Ruse would be criticized by other philosophers, who contended that this stance obscured the difficulties with Popper’s demarcation criteria and

with the demarcation problem itself,<sup>325</sup> Ruse himself would go on to acknowledge the rhetorically pragmatic nature of his testimony while defending these choices as necessary for the greater good of science education.<sup>326</sup> Both criticisms of Ruse's testimony and his defense of it will be discussed later in this chapter. For now, I turn to how Ruse uses epistemic "would" in each of his four broader rhetorical strategies.

Using epistemic "would" to articulate demarcation criteria like falsifiability, Ruse enabled the plaintiff's team to keep the entire case focused on creation science's status as science, totally bypassing such defense claims that teaching evolution constituted an establishment of the religion of "secular humanism." Significantly, Ruse discusses falsifiability not only in terms of what counts as a scientific statement but also in terms of what counts as a religious statement. Adopting an impersonal construction in an early appeal to Popper for instance, Ruse notes "what Popper argues is that if something is a genuine science, then at least in the fault experiment, you ought to be able to think of something which would show that it's wrong." Burying epistemic "would" and the falsifiability criterion in the sentence's final relative clause, Ruse construes falsifiability as a functionally obvious ground rule of science.

By the same token, Ruse contrasts falsifiable, scientific statements with "religious statements." While being classified as "religious" does not necessarily make a statement false to Ruse, such a classification does function as, at the very least, a sufficient condition for not being considered scientific. Quoting an oft-repeated statement from the New Testament, Ruse observes "take, say, a religious statement like God is love, there's nothing in the empirical world which would count against this in a believer." With the modal verb again buried in a sentence-ending relative clause, this sentence also offers an interesting example of negation. The relative pronoun

---

<sup>325</sup> Larry Laudan, "The Demise of the Demarcation Problem."

<sup>326</sup> Michael Ruse, "Pro Judice."

“which,” referring as it does here to the noun “nothing,” essentially offers a total negation of the falsifiability criterion. If nothing could empirical could against a statement, then not only it does fail to qualify as science, but it is actually about as far away from science as a statement could possibly be. Classifying a statement as religious, then, becomes a means of not only negating its scientific status, but locating its epistemic status relative to other potentially scientific statements. Given the way in which “science” functioned as a universally positive signifier across this debate, then, the rhetorical value of Ruse’s articulation of demarcation criteria becomes hard to dispute.

Having established falsification as the primary point of demarcation between scientific and other kinds of statements, Ruse applies this criterion to Act 590, explicating the degree to which its text accurately discusses science. To the untrained observer, the observer to which creation scientists might prefer to appeal, the explicit absence of the word “creator,” which could suggest a more “neutral” approach, in the text might seem to complicate Ruse and the plaintiff’s team’s identification of the creation science referred to in Act 590 with specifically religious ideas. Here, Ruse carefully attributes vaguely conspiratorial motives to the Act’s drafts, observing “I don’t see the word creator. I think the Act is very carefully written so that I wouldn’t.” The position of “would” near the necessity pole of the epistemic modal scale and its negation have two effects. First, this grammatical construction allows to Ruse to imply, without specifying, an intent to deceive or mislead on the part of Act 590’s drafters. Second, it allows him to distinguish between how an untrained eye might read the text of the Act and the way he, with trained, expert judgment, might read it. The double effect of Ruse’s use of epistemic “would” here allows him to simultaneously assert the need for an expert reading of the text while displacing the reading of the text that the defense team would prefer.

Casting doubt on the motives of Act’s drafters likewise creates the rhetorical space in which Ruse disputes the ways in which the Act construes key scientific concepts, such as evolution. As Ruse discusses his objections to the Act’s presentation of evolution as positing that life evolved from a single organism, for instance, the previously established negative motives provide for the listener the suggestion that an intent to distort evolution rather than ignorance of its precepts offers the more likely motive for this discrepancy. In a sentence containing three epistemic uses of “would,” for instance, Ruse notes “I think one would find that most evolutionists would feel more comfortable with 4(a)(2) except I’m not sure they would want to, say it all came from a single organism.” Note in addition Ruse’s embedding of his opinion and his modal verbs in third-person impersonal constructions. The negation of the sentence’s final clauses also stands out. Attributing a not insignificant degree of certainty to his own judgment in a clause with a first-person subject, Ruse again uses an impersonal construction to attribute to “they,” – in this case, evolutionists – his own judgment about what the scientific community might think. Having been observed in both rhetorical moves so far discussed, modalized impersonal constructions, which allow Ruse to present his own judgment as a third person “observation,” seem to be key grammatical components of Ruse’s epistemic stance and, consequently, his rhetorical stance.

This stance proved especially beneficial when Ruse concluded his testimony by classifying creation science as religion and, by implication, Act 590 as an establishment of religion. From a Constitutional standpoint, the question of religious demarcation matters considerably more than the question of scientific demarcation,<sup>327</sup> so one might be surprised by

---

<sup>327</sup> See Kent Greenwalt. *Does God Belong in Public Schools?* (Princeton and Oxford: Princeton University Press, 2005): 116-125 for a discussion of the question of legally demarcating religion in the context of the curricula of various states and the United States as a whole.

the relatively small amount of attention, at least when compared to the question of scientific demarcation, devoted to this question in either the literature surrounding the trial or in the testimony delivered at it. Nevertheless, the greater amount of time spent on the scientific demarcation question, especially the time spent establishing the five criteria that Overton would later cite in his decision, all pointed to the religious demarcation question.

Ruse addressed this question in a single statement that used epistemic “would.” This statement, perhaps not incidentally, was also the final sentence of Ruse’s testimony. Invoking his professional standing as a philosopher and a historian, Ruse concludes his testimony by noting of creation science that “speaking as a philosopher and speaking, also, as one who teaches philosophy of religion, I would say that it is religion.” While the inclusion of epistemic “would” in this statement does introduce a perhaps rhetorically necessary level of tentativeness, the high degree of necessity expressed by “would” makes Ruse’s ultimate conclusion unmistakable: creation science, failing to meet any of the five scientific demarcation criteria, is instead religion and, consequently, an unconstitutional establishment of religion.

Considering the verb variety in Ruse’s uses of epistemic “would” provides further evidence of how Ruse construed his opinions as more neutral observations akin to scientific facts. Verbs of thinking or perception were often modalized in clauses of indirect speech with impersonal pronouns such as “one” acting as their subjects. The use of “one” to refer to people in general is not uncommon, but in this context this grammatical construction took an especially useful rhetorical effect for Ruse.<sup>328</sup> Ruse’s use of “falsify” as a verb modalized by epistemic “would” also stands out. This occurs when Ruse gives an example of what he means by the concept of falsifiability. Articulating a hypothetical situation in which a scientist finds fossils

---

<sup>328</sup> See Bryan Garner, *The Chicago Guide to English Grammar, Punctuation, and Usage*, (Chicago, University of Chicago Press, 2016): 57, for discussion of this pronoun with respect to general English pronoun usage.

inconsistent with evolution, Ruse observes “Well, that would obviously be falsifying evidence of evolution theory.” In other words, in explaining the concept of falsification, Ruse also argues for the falsifiability and, consequently, the scientific status of evolutionary theory. This embedded argument especially stands out when compared to how Ruse imagines the complete non-falsifiability of statements that he classifies as religious, such as “God is love.”

### **Can**

Although “can” appeared in just over half the number of word tokens as did “would,” nearly all of Ruse used this modal epistemically in 14 out of its occurrences, giving “can” a much higher ratio of epistemic uses than “would” when accounting for the total number of word tokens. From a general grammatical standpoint, Ruse’s uses of epistemic “can” do not differ very significantly from his uses of epistemic “would.” For example, he frequently construes his opinions in modalized third-person statements in impersonal constructions or using indefinite pronouns.

From a rhetorical perspective, however, some small distinctions appear. The articulation of demarcation criteria and the explication of Act 590, two of the rhetorical strategies discussed above, recurred alongside a new rhetorical strategy – the attribution of motives to evolutionists and creation scientists alike. This strategy appears in a number of interesting forms. More than once, for instance, Ruse puts words into the mouths of creation scientists, offering what he imagines their responses to various questions might be. He also quotes selectively from the work of creation scientists, using their own epistemically modalized sentences to attribute motives to them. This choice presents an interpretive problem about how to represent the total number of word tokens and epistemic uses of “can” in Ruse’s testimony since, although he spoke the words, they weren’t really *his words*. Consequently, although I chose not to “count” them for the

purposes of representing the number of word tokens or epistemic uses of “can” in Ruse’s testimony, they will be discussed below. The implications of this narrow method of interpretation will be discussed in chapter five.

Two of Ruse’s five scientific demarcation criteria appear in his uses of epistemic “can.” Asked about demarcation with which philosophers of science would “generally agree,” Ruse named tentativeness, science’s openness to revision, in an utterance that also named empirical testability and the need to be explanatory. As Ruse puts it, “Another characteristic, and perhaps we can stop with these, is that it’s going to be tentative.” In this initial discussion of tentativeness, epistemic “can” allows Ruse to signal to the judge, attorneys, and others in the courtroom that this brings the “naming” phase of his discussion to an end and that he will now explicate each of these criteria. Elaborating on the meaning of tentativeness, then, Ruse explains, “It’s [science] going to be, in some sense, not necessarily the final word.” When Ruse later discusses creation science with respect to this criterion, tentativeness will be a fundamental way in which creation science, by beginning and ending with Genesis, fails to meet the standards of science.

Epistemic “can” also appears in Ruse’s discussion of his “science must be explanatory” criterion. This term might seem somewhat vague on its own, but he elaborates on it to mean that explanations must be made with reference to “law.” Elaborating on this criterion, Ruse contends “When I talk about science, or when philosophers and scientists talk about science being explanatory, what we mean is that in some sense we can show that phenomena follow as a consequence of law.” The unsurprising repetition of the third-person, impersonal construction notwithstanding, Ruse elaborates on what he means by law with an analogy. Asking the court to imagine a situation in which “a baseball is being pitched from the pitcher to the hitter, and the

ball goes along and then suddenly it dips down. The guy swings and the ball is not there,” Ruse contrasts thinking in terms of “divine intervention” with thinking in terms of natural explanations, with specific reference to the laws of physics. Since Ruse also uses epistemic “might” to construct this analogy, I will return to it later. These considerations notwithstanding, I can still observe now that in the demarcation discussion surrounding *Kitzmiller v. Dover* nearly thirty-five years later, this same basic idea referred to by Ruse will be denoted with the term “methodological naturalism” and will feature as one of the central complaints that proponents of intelligent design will have about how normal science is conducted.

In using epistemic “can” to explicate Act 590, meanwhile, Ruse links the law to the specific ideas and works of creation scientists. Considering that Arkansas needed to be able show the secular purpose of the law in order to defend it, this move put a heavy burden on the defense team to meet this standard. In one statement, for example, Ruse connects Act 590 to the works of leading creation scientist Henry Morris, observing when asked of specific sections of the act that “every one of these elements in 4(a)(1), 4(a)(2), so on and so forth, as you go down them, can be found mirrored virtually exactly in almost the same order in Morris' edited book, *Scientific Creationism*.” This appeal to the arrangement of material in the Act not only suggests the historical connection between Act 590 and the creation science movement but also implies that the bill’s drafters were either so confident that their law would withstand scrutiny that they did not think it important to distinguish their work from that of Morris or that they were so careless that they did not even notice.

Rhetoricians have long been concerned with how motives are attributed to people, and Ruse’s uses of epistemic “can” offer several examples of the linguistic work involved in explaining what someone else is up to. Ruse attributes positive motives, like a concern for

scientific rigor, to proponents of evolution. Discussing, for example, their work to find evidence for evolution, Ruse observes “Since Darwin, evolutionists have been working hard to find places where they can say, ‘Look, here is something that actually did evolve from one form to another,’ and they came up with some examples.” This sentence allows Ruse to attribute motives to creation scientists because the modalized verb say is used to embed a clause in which Ruse “takes on” the persona of an evolutionary biologist. This construction’s modalized use of imagined direct speech enables Ruse to emphasize evolution proponents’ concern for scientific rigor not only because the direct speech is grammatically distinct from the clauses that surround it but also because its content highlights biologists’ actual observations of evolution. Indeed, he notes that “scientific creationists can’t get away from this fact,” he is referring to directly the discovery of such examples.

Comparing this sentence to sentences in which Ruse attributes motives to creation scientists, the dichotomy of motives becomes even more obvious. Near the end of his testimony, Ruse quotes sentences modalized with epistemic “can” from Duane Gish’s book *Evolution! The Fossils Say No* to illustrate that even creation scientists acknowledge that their claims do not really pass scientific muster. Quoting Gish, Ruse reads, “‘This is why we refer to creation as special creation. We cannot discover by scientific investigations anything about the creative processes used by the Creator.’” This sentence is immediately followed by Ruse’s own un-negated, modalized declaration that “I don’t think you can get much more blatant than that.” The public reading of Gish’s negated, modalized sentence followed by Ruse’s equally modalized but un-negated sentence exploits the lexical and grammatical antithesis of these two examples of epistemic “can” in order to imply that creation scientists’ actual motives might differ from their avowed motives. Notably and wisely, Ruse does not *specifically* accuse creation scientists of

creation scientists of outright lying; instead, he leaves the audience to make the necessary inference from Gish's words.

### **Could**

Despite using "could" fewer overall times than either "would" or "can," Ruse deployed "could" in an epistemic sense nearly every time he used this modal. Many of the rhetorical strategies previously identified recur as Ruse articulates demarcation criteria and attributes motives to evolutionists. A fifth strategy appears, though, as Ruse's uses of epistemic "could" also include several examples of his narration of the history of science. This strategy, which plays on popular conceptions of science as "progressing" in a more or less linear way over time, reveals an aspect of the scientific establishment's rhetoric not often acknowledged in the literature – namely, that, like creation scientists, rhetors representing the scientific establishment appeal to popular rather than technical notions of science. While acknowledging this appeal does not raise any doubts about the rhetorical efficacy of Ruse's highly simplified narrative, which presents the theses of creation scientists as relics of the past, doing so does complicate the claim that trials such as *McLean* represent a simple conflict between science and religion or between expertise and anti-expertise. Indeed, that Ruse's narrative succeeded, and that its oversimplicity went unrecognized and unchallenged by Overton shows that, when appealing to non-expert audiences at least, the most successful experts will work around the philosophical problems of expertise by justifying technical claims via appeal to popular belief.

In order to focus on this new rhetorical strategy, I will pass quickly over recurring examples of Ruse's articulation of demarcation criteria and his attribution of motives to evolutionists. Significantly, Ruse can be seen again emphasizing falsification as the most important demarcation criterion and, from a grammatical perspective, an interesting interplay of

modal verbs can be observed in his definition of the concept. As he puts it, “the idea of falsifiability is that there must be, as it were, if something is a genuine scientific theory, then there must, at least, conceivably be some evidence which could count against it.” More will be said about this particular example in my discussion of how Ruse’s epistemic “must,” I will note for now the double modalization in the sentence and its impersonal construction. The use of “must” in contrast with “could”, meanwhile, offers another example of the modal antithesis mentioned previously. More, however, will be noted about this example later.

Attributing motives to evolutionists, Ruse again imagines what they might say with respect to the science of evolution. Asked to distinguish the scientific literature of creationists from that of evolutionary scientists, Ruse points to the ways in which creation scientists dichotomize the debate so that creation science becomes the default choice in the face of *any* evidence against evolution. But “if you look at what evolutionists and other scientists are saying is,” Ruse continues, “they are saying, ‘Well, no, there could be other options.’” In these statements, Ruse essentially operationalizes his demarcation criteria, showing alternatively how one community, that of the evolutionists, applies them to their day-to-day businesses and how another, that of creation scientists, fails to do so. Creation scientists not only fail to do what scientists really do but also are not even motivated by what motivates scientists.

Narrating the history of science stands out as the most significant strategy among Ruse’s statements using epistemic “could.” In two of the five total statements, Ruse refers to significant points in the history of science. For instance, when asked to explain how far back the scientific consensus on evolution goes, Ruse speculates that “you could well go back to the Greeks.” The addition of the adverb “well” adds a further epistemic dimension to this clause, providing both a further lexical marker of the statement’s epistemic nature and a slight modification, in the

direction of necessity, to Ruse's epistemic stance toward the statement. In this way, a listener's attention is drawn to Ruse's reference to the Greeks.

More importantly, the reference to the Greeks itself serves two purposes – one popular, the other technical. Most Americans treat references to persons or events sufficiently far in the past (though a precise dating is probably impossible) with a certain amount of reverence. Thus, the popular appeal to the so-called “intent of the Founding Fathers,” despite the inherent ambiguity of both the term and of any particular conception of either the Founding Fathers or their intent, remains surprisingly durable in American discourse despite its relative imprecision as an actual legal test. Even Americans who cannot name the year in which the Constitution was ratified will treat the Founding Fathers with a certain amount of awe. The Greeks, lying even further in the past and therefore being even more mysterious, are typically treated with analogous respect. Americans who have never read a single Platonic dialogue might still have seen popular images of, for instance, Raphael's “School of Athens” painting, and they will offer a certain amount of argumentative deference to such appeals. Like the moral penumbra Cicero frequently said emanated from the law, such appeals emanate a recognizable though not unlimited rhetorical penumbra that makes them useful for grounding historical claims. For a popular audience, then, the reference to the Greeks makes evolution *appear* more understandable even to someone who might not actually have any particular knowledge of the Greeks or evolution.

The popular recognizability of this appeal alone, of course would not make it a successful technical appeal. The earliest evolutionary theories *do* date back to the Greeks, lending technical weight to Ruse's testimony. But this is not the most interesting thing to note about Ruse's appeal to the Greeks. More interesting than the appeal's popular or technical success, though, is what it reveals about the relationship between the rhetor and the rhetorical situation. While scholars

working within evolutionary biology or in the philosophy of science have a certain amount of control over the kinds of arguments that get admitted into their literature – and consequently the kinds of arguments an expert witness can draw upon on the witness stand – these experts have little control over the kinds of appeals that make their way into the popular or public spheres of discourse. This represents a constraint, in the classic sense of the term, imposed on the rhetor by the rhetorical situation. The efficacy of Ruse’s appeal to the Greeks here, then, lies in how it plays a pre-established appeal in the popular imagination as well as in the technical literature. The ultimate *success* of Ruse’s testimony in general, meanwhile, suggests that such polysemous appeals have much potential. While the present study doesn’t offer enough data to make a case for the general success of these appeals, it does offer enough to justify a call for further research into appeals that have distinct, yet simultaneously positive, meanings for popular and technical audiences.

Having begun building his narrative on ground shared by popular and technical conceptions of the history of science, Ruse slowly adds layers introducing facts recognized in the technical sphere but, perhaps, contentious in the popular sphere. From the Greeks, then, he arrives at point at which “in the biological sciences themselves, people are finding more and more evidence which were leading them to think that maybe Genesis wasn't quite all that could be said.” This statement stands out not only for its combination of modalization and hedging but also for its subtle introduction of the most controversial plank of Ruse’s position. Perhaps *because* this is precisely the point of contention between creation scientists and mainstream scientists, Ruse deploys the familiar grammatical strategies of rendering contentious statements in negated, modalized dependent clauses. The additional hedging phrase “quite all” only further highlights, at least for the rhetorician, the contentious nature of the statement’s contents. Buried

in these grammatical forms and resting on the layers of popular and technical agreement previously established, the extremely controversial nature of this claim seems almost perfectly buried beneath layers of carefully stratified rhetorical sediment.

### **Might**

Turning to how Ruse used epistemic “might,” we observe many familiar rhetorical moves. Ruse modalized verbs with epistemic “might” five times in order to distinguish the scientist’s attitude from that of the lay person, narrate the history of science, and differentiate investigation into evolution from investigation into the origins of life. Of particular note, two of these modalizations occur as components of interesting analogies that Ruse uses to explain what differentiates how a scientist views things from how a lay person might view things. In the one, Ruse explains how a scientific expert and a lay person might view a given phenomenon. In the other, Ruse grounds his analogical reasoning in common sense. Taken together, these analogies bolster his expert opinion that, from both a tutored and untutored perspective, neither the general doctrines of creation science nor the particular mandates of Act 590 belong in Arkansas’s biology classrooms.

Understanding how Ruse separates the expert from the lay perspective reveals not only how he hopes to establish his own expertise but also how he hopes to establish the expertise of scientists more generally. In one of the two analogies that use epistemic “might,” Ruse asks the audience to imagine a baseball that, having just been pitched, suddenly disappears as the batter makes his swing. Were such a thing to happen, Ruse goes on, “The pitcher,” whom he has deployed as a stand in for the hypothetical lay person, “might start thinking in terms of divine intervention.” A scientist, however, would not even consider such a non-natural explanation. As Ruse observes, “a scientist would be saying things like, well, now, why did this happen. Well,

let's look at Galileo's Laws; let's look at laws to do with air resistance together with initial conditions like the speed the ball was thrown and so on and so forth.” The antithesis between these two modalized statements — the former modalized to emphasize uncertainty and the latter modalized to emphasize certainty — perfectly illustrates how Ruse imagines the expert, scientific perspective to be distinguished from that of the lay person. Supernatural causation, which the lay person might admit into the realm of possibility, will not even be entertained by the scientific expert. This way of conceptualizing the scientific expert as a kind of exemplar of Cartesian notably contrasts with other ways of imagining the same, such as William Jennings Bryan’s simplistic notion of the scientific expert as simply a repository of undisputed facts, perhaps akin to a talking book.

Ruse could, however, be criticized for using an analogy that creates such a sharp line between the trained and untrained way of seeing the world, making the lay person seem to depend totally upon the expert. The baseball player Ruse uses to characterize the layperson’s perspective does seem just a little credulous. Using a second analogy, Ruse deploys epistemic “might” in an illustration of how even common sense leads to the distinction he wants to make, thus insulating himself, at least a little, from this criticism. In making this analogy, he compares the process of establishing scientific truth to the process of establishing a criminal’s guilt. He asks the audience to imagine that, after someone has been convicted of a crime, new evidence comes to light that might support a different interpretation of the case. That case, he notes, might be reopened. Science functions in the same way. As he puts it: “if you just establish something, and then something...comes up fairly soon afterwards, then you're going to rethink it. On the other hand, suppose somebody has been convicted twenty years ago, and his mother on the deathbed says, ‘Well, he didn't really do it.’ Well, you might say, “I'm not too sure about that.” In

other words, just because scientists remain sensitive to new evidence doesn't mean they remain equally sensitive to *all* evidence. Similarly, as a theory stands the test of time, the burden of proof slowly shifts in favor of it, forcing advocates of new ideas to argue all the more rigorously for their ideas. This state of epistemic affairs, Ruse not-so-subtly implies, represents the present relationship between evolutionary science and creation "science."

Indeed, evolution's particular role as the theory that best explains the data of biology, Ruse will go on to observe, justifies this status quo. This stance can be more precisely observed in two statements in which epistemic "might" helps Ruse to distinguish the uniformity of opinion on evolution from the diversity of opinion about the question of origins by reference to the epistemic status of each. Whereas almost all biologists agree that evolution has occurred, they did not then, nor do they now, agree on how the universe and biological life *began*. Indeed, Ruse locates this longstanding disagreement deep in the respective histories of science and philosophy. "During the eighteenth century," he observes, "there was an awful lot of speculation and hypothesizing about the way in which the universe might have come about through natural law" and even today." As time went on, biologists narrowed their focus to investigate the origin of life itself. To Ruse, though, the important thing is that while "there's certainly several hypotheses about how this might have happened," all competent biologists, whatever their theories as to how the universe or life *began*, agree about how it developed.

Making this distinction according to the epistemic status of the relevant questions allows Ruse to respond to the criticism that evolution necessarily entails atheism. Ever since Darwin published the *Origin*, evolution's critics have suggested that it necessarily necessitates atheism — and all of its associated threats to civilization — because it suggests that life itself *began* through blind, chance processes. Although this criticism had been answered numerous times

before *McLean*, it had also proven an efficacious strategy because it took a narrow question requiring technical expertise, namely, “how did biological life develop?” and “inflated” into a question of more general concern, “how did biological life begin?” Ruse’s treatment of these questions has two effects. First, in distinguishing the questions of evolution from the question of origins, he makes rhetorical room for trained, expert judgment to subordinate “common sense” because it narrows the range of persons competent to evaluate the fact of evolution. The key question transforms from one about which any person may competently express an opinion to one dependent on training, experience, and judgment. Second, in emphasizing biologist’s diversity of opinion on origins, Ruse reinforces their common acceptance of evolution, showing that, far from being a closed-minded, dogmatic intellectual cabal, the scientific community is operating much in the way that both experts and laypeople alike might expect and hope.

### **Must, Will, and Should**

The chart at the beginning of this section reveals why I have chosen to address Ruse’s use of three final modals — must, will, and shall — together, for it offers an interesting study in how witnesses contrast not only possibility with necessity but also verb variety with verb focus. While Ruse used epistemic “will” six times, each time with a unique verb, he used epistemic “must” and “shall” with only a single verb each (though he did not use “must” and “shall” with the same frequency). While calling the lexical narrowing and expansion observable here a deliberate “strategy” might attribute more intention than can be readily inferred from the data presented here, this qualification does not preclude an adequate description of this process from being made.

Although Ruse uses epistemic “must” three times, he uses it only to modify imperative statements using “be” as their main verb, and two of these uses occur in a single sentence, so

there are only two sentences total. Despite using the same verb and the same basic construction, though, each sentence serves a distinct rhetorical role. Looking at the first sentence, we observe Ruse again summarizing the falsifiability criterion, saying “if something is a genuine scientific theory, then there must, at least, conceivably be some evidence which could count against it.” If emphasis is correlated with frequency, then, of all of Ruse’s “five essential characteristics of science,” this one has now received the most emphasis. In the second sentence, Ruse disqualifies creation scientists from the ranks of practicing scientists by pointing to their literature’s overt polarization between creation science and evolution. By the time of this trial, of course, such polarization had been a long-recognized hallmark of creation scientist’s writings as well as those of fundamentalists more generally. Rejecting this false dichotomy, Ruse remarks that this error disqualifies creation science as actual science because, in genuine science, “One doesn’t have to say, ‘Well, it must be one or it must be the other.’” Here, Ruse has modalized a statement that is not only negated through indirect speech but also attributed to some hypothetical stand-in for a creation scientist — note the impersonal construction. In this way, he disavows the often performative certainty displayed by creation scientists in their writings and, more especially, their frequently criticized public debates.<sup>329</sup>

Whereas Ruse modalized only a single verb with epistemic “must,” each time he used “will” to modalize a verb, he used it with a unique verb toward three ends: locating natural selection’s role within the evolutionary process, explicating Act 590, and describing how creation scientists misrepresent science. While the first two have discussed in my analysis of Ruse’s other modalized statements, the third has only just appeared. Of the six verbs modalized by epistemic “will,” five are verbs of reporting or perceiving, and all in context express some

---

<sup>329</sup> One thinks especially of Duane Gish’s debate on the Liberty University campus with Harvard biologist Dr. Russell Doolittle, viewable at [https://youtu.be/aOfenEX\\_8o8](https://youtu.be/aOfenEX_8o8).

form of abstract mental activity, showing how modalized abstract verbs emerge again as one of the linguistic signatures of the epistemic stance assumed by a successful courtroom performer of expert ethos.

Ruse uses epistemic “will” only once to locate natural selection’s role in the evolutionary process. This single occurrence happens within a somewhat parenthetical sentence in which Ruse distinguishes debates about the role of natural selection within evolution from debates about the fact of evolution, about which he emphasizes the general consensus. Speaking of these debates, he notes, “you’ve got some people who want to argue that there are other factors which are probably very important random factors, some important genetic drift — I’m sure you will be hearing more about that — and other sorts of factors which could have been involved in evolution.” To appreciate the role of epistemic “will” in the statement “I’m sure will you be hearing more about that,” it is useful to observe that Ruse is basically using “sure that” as a marker of the indirect discourse that follows. The main verb phrase “sure that” effectively anticipates and amplifies the certainty expressed by the modalized verb phrase. Put simply, this kind of construction enables Ruse to express even greater certainty than the scale of possibility/necessity expressed by the English modals. In this statement, he is, in one sense, “more than certain” of the veracity of what he says.

Meanwhile, in using epistemic “will” to explicate Act 590, Ruse illustrates how the law’s own language demonstrates the non-scientific nature of creation science. More specifically, he contrasts the language of section 4(a)(1), which defines the term “creation-science” as postulating the “sudden creation of the universe, energy, and life from nothing” with the language of section of 4(b)(1), which defines “evolution-science” as requiring “emergence by naturalistic processes of the universe from disordered matter and emergence of life from

nonlife.”<sup>330</sup> These definitions, significantly but unfortunately for the defense, end up separating creation science from evolution on precisely the line of methodological naturalism that Ruse has been using to separate science from non-science. Directing his listeners to the role of the term “naturalistic,” he remarks “you will notice that the key new word here is naturalistic processes, which doesn't occur in 4(a)(1), sudden creation.” This language leads Ruse to infer that “that we are dealing with non-naturalistic processes in 4(a)(1) and non-naturalistic processes, meaning by definition a creator.” In so implying a creator, then, Act 590 not only reveals the non-scientific nature of creation science but also its inherent religiosity. Thus, how each side’s experts defined “religion” became significant — perhaps just as important as how they defined science — in the overall structure of their cases. When the testimony of the main opposing expert witness, Norman Geisler, is compared to that of Ruse, we will also see that whether postulating a creator makes a statement or idea inherently “religious” is also just as stark of a dividing line between the two sides’ cases as how they defined the term “science.”

In four remaining clauses, Ruse deploys epistemic “will” to describe how creation scientists misrepresent science, a fault that he also suggests is no mere accident. Two of these clauses occur in a single statement, while the other two occur independently. Early in his testimony, Ruse had suggested that creation scientists often misrepresent debates about the process of evolution as debates about the fact of evolution. Asked to elaborate on that claim, Ruse responds, “Well, what they do is they'll, say, take a passage where a scientist, a biologist, something like this, is talking about the question of causes, the question of reasons, this sort of thing, and they will quote just this one sentence or half a sentence, one paragraph, and then as it were, automatically assume and lead the reader to assume that what's under question here is the

---

<sup>330</sup> Act 590 of 1981, *McLean v. Arkansas Documentation Project*, [http://www.antievolution.org/projects/mclean/new\\_site/legal/act\\_590.htm](http://www.antievolution.org/projects/mclean/new_site/legal/act_590.htm).

actual occurrence of evolution itself.” Although Ruse does not outright accuse creation scientists of lying, he strongly suggests that this kind of misrepresentation would be here to do by mistake. Bolstering this implication, he compares evolution’s representation in creation science literature to how evolutionary biologists talk about it, and he also compares passages in creation science literature to passages that creation science proponents have excerpted from the scientific literature. Noting, for instance, that the fact of evolution does not necessarily entail any answers to the question of how life began, Ruse observes “I mean, obviously, evolutionists are going to be interested in the topic, and today certainly textbooks will probably mention it. But it’s not part of the evolutionary theory proper.” In other words, diversity of opinion about the question of origins does not track with divergence of opinion about the fact of evolution. This compatibility accounts for the presence of theistic evolution among the range of opinions held on origins. In his final use of epistemic “will,” meanwhile, Ruse further suggests that some level of intentionality must be operating in the way creation scientists selectively quote passages from the scientific literature, often with the effect of making the original passages imply the opposite of what their authors intended.

This occurs, Ruse notes, in books such as *Creation: The Facts of Life*, which was one of the lesser-known attempts to explain such phenomena as fossil evidence through the creation science paradigm. Written by Institute for Creation Research faculty member Gary Parker<sup>331</sup>, who possess a doctorate in education from Ball State University, this book combines Parker’s personal narrative of his journey from evolutionist to “Bible-believing Christian” with the typical flood geology and attacks on evolution found in creation science literature. What Ruse notes,

---

<sup>331</sup> Parker currently serves as adjunct faculty for the ICR and as the Chief Science Educator for the “Creation Adventures Museum,” which he also helped to found, in Florida, <http://www.creationadventuresmuseum.org/wp/about-us/>.

however, is how authors like Parker selectively quote evolutionists such as Richard Lewontin, quoted extensively by Parker in *Creation: The Facts of Life*, to suggest that they too doubted the fact of evolution. With Parker's and Lewontin's books side-by-side, Ruse directs his examiner's attention to this discrepancy, saying, "In fact, if you look at the original, you will see that this actual passage occurs in the second column. And what Lewontin is saying in the old days before we taught Darwin, people believed that adaptation was the evidence of a designer." Were Lewontin was attributing belief in a designer to others, Parker was attributing belief in a designer to Lewontin. Though he does not do so in a modalized statement, Ruse, in calling this tactic "a rather sleazy practice", certainly does not seem to suggest that he thinks creation scientists have merely misunderstood the scientific literature.

Finally, although Ruse uses "should" twice, he uses it epistemically only a single time. Discussing the rhetorical tactics of creation scientists, Ruse explains the arbitrary way in which creation scientists deploy scientific terminology to attack evolution. More specifically, he refers to the notion of "homology," a term evolutionary biologists use to discuss parts of organisms that have analogous structure but serve distinct functions. Such parts, which are largely considered evidence for common descent, pose "real problems for creationists because they are used for different functions and yet, why should you have these similarities." Yet, as Ruse goes on to observe, creation scientists frequently construe the debate so that they can take either the presence or absence of a given kind of evidence as proof positive for their position. As Ruse observes, "What creationists say...is 'Oh, well, if you don't find any homologies, then God was just working His purpose out. If you do find homologies, then, well, God would have a special plan in mind.'" In this way, rather than through the normal means of scientific publication and

debate, creation scientists attempt to construe technical terminological, largely appealing to the general public's ignorance of science, to stack the deck in their favor.

### **Analysis of Norman Geisler's Testimony**

The table below summarizes the frequency of epistemically modalized statements in the testimony of Norman Geisler, who at the time of *McLean* worked as a professor of philosophy and theology at Dallas Theological Seminary and served as the defense team's main expert witness. Like Ruse, he testified about demarcation criteria, the general relationship between science and religion, and whether Act 590 created an unconstitutional establishment of religion. His testimony also earned him momentary, though probably unwanted, fame when, under cross examination, he contended that "UFOs are a satanic manifestation in the world for the purpose of deception."<sup>332</sup> While his direct testimony, to which I now turn, did not touch on topics quite so eye catching, it does offer some further lessons in the rhetorical uses and functions of modalized statements. It shows, for instance, how modalized statements help Geisler to expand the definitions of key terms like "science" and "religion" so that the former is broad enough to include creation science and the latter to include evolution. It also shows how, with 28 statements modalized for epistemic necessity and 32 modalized for possibility, he demonstrated the general balance of modalized statements that the expert and counter-expert stance require. Furthermore, it shows how Geisler attempts to distinguish the creation scientists of his day from the Fundamentalists of the 1920s and 30s. Furthermore, it also offers another illustration of a more general problem in the study of modality — namely, practically distinguishing between epistemic and dynamic modality. A number of Geisler's modalized statements, especially those

---

<sup>332</sup> Phillip Hilts, "Creationist Tells of Belief in UFOs, Satan, Occult," *Washington Post*, December 12, 1981, <https://www.washingtonpost.com/archive/politics/1981/12/12/creationist-tells-of-belief-in-ufos-satan-occult/3f60dea6-7cdb-4556-8126-e86bfec0de1e/> offers a contemporaneous account of Geisler's entire testimony.

using “can,” might plausibly be interpreted as either epistemic or dynamic, depending on how one chooses to weigh certain elements of the context. In cases where ambiguity exists, I have found that paraphrasing modalized clauses or sentences in the third person into impersonal constructions following a formula like “it is possible to <x>”, where x represents the relevant verb, to be a useful test of the greater plausibility of an epistemic interpretation. Similarly, I have weighed such statements in the first or second person as more heavily dynamic because the first and second person emphasize, alternatively, the subjective experience or ability of a speaker or listener. One exception that emphasizes this challenge, though, lies in the idiomatic expression “you can/can’t have <x>,” which is commonly used in American English as of way speaking vocatively about possibility. Geisler deploys this construction, about which more will be said later, several times.

**Overview of Norman Geisler’s Testimony**

<b>Word Token Frequency Rank</b>	<b>Modal Verb</b>	<b>Number of Word Tokens</b>	<b>Epistemic Uses</b>	<b>Number of Unique Verbs Modified in Epistemic Uses</b>	<b>Unique Verbs Modified in Epistemic Uses</b>
1	would	24	20	11	be, assist, distinguish, make, repeat, come out, call, back off, get, imply, take on
2	could	16	11	6	be, make, have, become, see, refer (passive)

3	might	11	11	8	note, add, see, approach, trigger, lead, say, bring
4	will	10	4	3	be, base, make
5	can	8	10	9	have, believe, test (passive), prove (passive) approach (passive), teach (passive), take (passive), dig, find
6	should	8	1	1	take
7	must	6	3	2	be, have
8	may	6	2	1	apply
<b>Totals</b>	–	79	61	31	be, assist, distinguish, make, repeat, come out, call, back off, get, imply, take on, have, believe, test, prove, approach, teach, take, dig, find, become, see, refer, note, add, trigger, lead, say, bring, base, apply

## Would

As the chart summarizing Geisler’s testimony illustrates, he used “would” epistemically twenty times, slightly more frequently than he did “can,” even though he used the latter modal more overall. Geisler also uses epistemic “would” in 50% of his total uses of this modal and, in that way, resembles the other three witnesses so far discussed, who also display about a 50% ratio of epistemic to non-epistemic uses of this modal. In any case, since Geisler uses epistemic “would” in only three broader appeals — distinguishing “belief in” from “belief that,” explaining

how God can be an object of scientific study, and differentiating creation scientists from fundamentalists — the relationship between his modalized expressions and more general strategy can be examined in considerable detail. Indeed, in statements modalized with epistemic “would,” Geisler performs some of the most interesting rhetorical work of his testimony.

As has been previously noted, Geisler did not treat statements like “God exists” as inherently religious. Examining how he used epistemic “would,” we see his further work to make this distinction. Perhaps most interestingly, Geisler not only refuses to regard belief in God as inherently religious, but also refuses to regard belief in evolution as inherently non-religious, a stance which certainly would have confounded fundamentalists like William Jennings Bryan, who treated belief in evolution as equivalent to atheism. In three consecutive statements modalized with epistemic “would,” Geisler explains his position more completely. As he puts it, “what I would say is something like this. If the belief that there is an ultimate is automatically in and of itself a religious commitment, then the belief that there is evolution would automatically in and of itself be a religious commitment. Of course, that would be unfair to say that somebody who believes in evolution has automatically made evolution his God.”<sup>333</sup> By “ultimate,” Geisler means, as he had noted earlier in his testimony, transforming something into an “object of commitment,” though he is somewhat vague throughout his testimony about what exactly that means.

This vagueness aside, Geisler’s attempt to bring the term evolution under the term “religion” offers a useful example of the rhetorical resources that become available when one dispenses with the conflict thesis as either an assumption about reality or a rhetorical frame for discussing apparent clashes between scientific and religious propositions. Most immediately,

---

<sup>333</sup> Geisler, *Creation and the Courts*, 162.

such a move allowed him to, as he did later, suggest that teaching evolution without creation science would itself function as an unconstitutional establishment of religion. Geisler probably could have done more with this distinction because, in the early days of evolutionary theory, there was something of a religious tone to much discourse about evolution. Even the plaintiff's lead expert, Michael Ruse, has acknowledged that, in the late 19<sup>th</sup> century, "evolution was in many respects no more than a secular religion, a vehicle for all sorts of moral and social claims."<sup>334</sup> Pushing this distinction a little further also would have allowed Geisler to deal with the oft-made claim that belief in evolution did not, in and of itself, entail any kinds of moral commitments and perhaps to shift the ground away from the material claims of evolutionists, claims that he would necessarily be hard-pressed to refute, and toward their moral and social claims, which creation scientists had already done — and with much success — in their public discourse.

As has also been earlier observed, Geisler's attempt to explain how scientists can study God rests on this distinction. One statement, which is also modalized with "might," illustrates this logical dependence. Comparing references to God in science textbooks to those found on the US's founding documents and currency, Geisler asserts "surely incidental references to a Creator are not essentially religious...if they are, then surely the pledge under God, the pledge of allegiance under God or in God we trust on coins or the Declaration of Independence, which refers to the inalienable rights of the Creator...would automatically thereby be religious if simply referring to a God." This analogy, while drawing on common enough examples, cleverly conflates highly generic references to God, which nobody disputes are to be found where he has observed, with the extremely particular concept of God discussed in the works of scientific

---

<sup>334</sup> Ruse, *Darwinism, Design, and Purpose*, 251.

creationists. Were the dispute merely about the term “God,” it would indeed be difficult to contend with Geisler’s claims.

Having reshuffled the terminological deck, Geisler could make an even more significant argumentative move by differentiating creation scientists from fundamentalists. Although, as discussed in Chapter 2, fundamentalists had “won” the Scopes Trial, they were tarnished by the enduring caricatures made of William Jennings Bryan’s testimony and by their portrayal in popular plays, such as *Inherit the Wind*, with its even more famous film adaptation. Furthermore, their public anti-intellectualism meant that association with them might belie these new activists’ self-proclaimed status as scientists. Responding to this need, Geisler devoted a number of statements modalized with epistemic “would” to explaining what distinguished the creation scientists of 1981 from the fundamentalists of 1925.

Two statements especially stand out. In the one, Geisler portrays creation scientists’ advocacy for equal time as a quality that especially separates them from fundamentalists. Asked about this claim, Geisler asserts that “you would never get a fundamentalist of the 1920, 1930 variety saying let’s teach evolution.” Geisler was definitely right, at least if one imagines William Jennings Bryan represented the typical fundamentalist. At the same time, it is easy to imagine why this failed to persuade Overton, especially since the fundamentalists’ position — to ban teaching evolution entirely — had already long since been taken off the table of available legislative options.

The weakness of this distinction aside, however, another statement modalized with epistemic “would” reveals a stronger dividing line between fundamentalists and creation scientists. Here, Geisler pointed out that, unlike the fundamentalists of the 1920s, his movement did not demonstrate a broadly anti-intellectual attitude. Indeed, as he did during his testimony

and as other creation scientists had long been fond of doing, Geisler boasted of their numerous advanced degrees earned. The relevant statement is worth quoting in full, for it reveals the germ of the strategy that would later be adopted by the Discovery Institute and which is now practically a commonplace in the appeals of those who use anti-expert rhetoric:

“I don’t see the anti-intellectual attitude you had from these fundamentalists, because this is saying let’s teach it as a scientific theory, which would imply we’re going to have to have scientists who have degrees that aren’t just attacking everybody who went away and got a Ph.D. and saying well, he’s just phenomenally dumb or the kind of satires that the fundamentalists would take on.”

In this statement, Geisler offers an early example of what I am calling the rhetoric of “counter-expertise,” which later intelligent design theorists and today’s anti-critical race theory activists have both deployed, frequently to much effect. The counter-expert positions himself as a dissident member of the academic establishment, one who disagrees with an orthodox intellectual attitude that is often maintained less by winning the debate than by censoring opponents. Depending on the degree to which the counter-expert feels himself a victim of the latter tactic, he may express greater or lesser sympathy with the non-expert or even begin to resemble the anti-expert. Indeed, counter-expertise and anti-expertise, as rhetorical stances, are neither conceptually nor empirically mutually exclusive. As we shall see especially when we examine intelligent design, and in chapter five when we pass over the ongoing anti-critical race theory efforts occurring both in public discourse and in state legislatures, counter-expertise often complements anti-expertise quite nicely. In the final analysis, then, we observe in Geisler’s tokens of epistemic “would” an important rhetorical bridge between the rhetoric of the 1920s and that of the 2020s.

**Can**

Three grammatical features - the use of idiomatic constructions, the use of passive verbs, and the use of generic “they”<sup>335</sup> — stand out immediately from the nine statements that Geisler modalized with epistemic “can.” In two of the statements, for instance, the epistemic sense of the clause is conveyed by Geisler’s use of a second person construction such as “you can’t have <x>,” a construction that typically appears more often in spoken than in written English. This construction, taken alongside Geisler’s use of the generic “they,” another hallmark of spoken rather than written discourse, gives his testimony as a whole a more conversational tone than that of Ruse. It’s hard to say whether Geisler deliberately deployed these constructions toward this end, but the correlation between the two is at least worth noting. The correlation of passive verbs with epistemic modality also stands out because other witnesses examined in this study, while they use passive constructions, do not do so at such a high rate with respect to the overall number of epistemically modalized statements. With respect to Geisler’s use of epistemic “can,” nearly half of such statements deploy passive verbs.

Grammatical observations aside, Geisler’s nine statements modalized with epistemic “can” function rhetorically in his efforts to explain the relationship between science and religion, define the role of God in religion and science, and establish the scientific veracity of the Bible. While Geisler’s position resembles that of Ruse in that he argues that science and religion do not conflict — and so repudiates the conflict thesis — he construes science and religion as harmonious and practically interwoven. While Ruse maintains the two terms’ independence instead of their opposition, Geisler attempts to bring the two terms together, as two different ways to observe the same truth. Indeed, other statements modalized with epistemic “can” illustrate his efforts to suggest the Biblical origins of many scientific theories as evidence for that

---

<sup>335</sup> I use this term to refer to the use of “they” to refer an unspecified, or perhaps unknown, subject, as in “Did you hear they passed a law banning Critical Race Theory?” or “I heard they told the professor he was fired.”

very terminological equivocation. Considering that the Bible is typically portrayed as the “testimony” of God has interesting implications for testimony as a species of evidence. At the very least, from this construal of rhetorical relations, testimony achieves parity with observation. In the most extreme sense, testimony subordinates observation. Geisler, like most creation scientists, evinces comfort with flexibly moving back and forth between these implications in order to make room for the “creation model” as a theory of origins.

Establishing the harmonious relationship between science and religion, Geisler uses epistemic “can” in statements which construe science and religion as two different ways to study the same subject matter — namely, God’s creation. While he rejects the conflict thesis, he also does not grant science epistemic primacy. Borrowing a metaphor from Paul Tillich, another theologian, Geisler suggests that science and religion function like two different paths up the same mountain. Elaborating on this image, he goes on to say, “One is approaching it philosophically, just from the standpoint of reason and what can be tested and proven. The other is approaching it religiously, but it’s one and the same peak.” Notice as well that this statement offers an example, with the verbs “test” and “prove,” of the passive constructions mentioned earlier. Modalizing a restrictive relative clause like “what can be tested and proven” to convey such a broad sense of possibility also suggests that not every true statement *can* be tested and proven and that, consequently, a statement could be true even in the absence of proof. On its own, this thesis is not so controversial and could even be considered obvious. But if every true statement can’t be tested and proven, then the naturalism central to the “materialist philosophy” that Geisler and other scientific creationists constantly decried likewise loses its evidentiary and argumentative force. Most practically speaking, this means that scientific experts lose some of their authority to rule in or rule out ideas like scientific creationism.

Having brought the terms “science” and “religion” together, Geisler also uses this “loose” construal of their relationship to make more specific room for God’s role in religion *and* science. Several times in his testimony, Geisler distinguishes between belief “in” God and belief “that” God, a difference that might be as hard for contemporary readers to follow as it was for Geisler’s examiners during the trial. As he puts it, “You can believe that there is a God and have no religious significance whatsoever.” To illustrate, he summarizes the views of Aristotle, who, as Geisler relates it, believed that “since you can’t have an infinite regress of causes, there must be a first unmoved mover.” This modalized statement also exemplifies the idiomatic use of second person “you can/can’t have” to express possibility in a general rather than subjective sense. Geisler contrasts such belief “in” God with belief “that” God is an object of worship or some other religious significance. From this distinction, Geisler wants to conclude that one can postulate God purely as a term within a scientific system, so that the mere mention of a creator in Act 590 — whether or not one identifies the creator as God — cannot be an unconstitutional establishment of religion in any case.

Yet even if one does identify the creator of Act 590 as God, even the God of the Bible, Geisler sees no reason to worry, for, as his remaining statements modalized with epistemic “can” show,” he makes the scientific veracity of the Bible itself a central component of his position. Geisler speaks to the many parts of the Bible currently being verified by scientists. Asked to offer examples of the Bible serving as a source of scientific discovery, Geisler affirms that “people can go digging around Jerusalem to see if they can find Hezekiah’s tunnel, and as a matter of fact, that’s exactly what happened. They have unearthed, by the science of archaeology, many of the very things mentioned in the Bible.” This statement might be interpreted as an instance of dynamic modality but for the fact that the “people” Geisler refers to

are not really specified. Referentially, then, the term “people” serves a grammatical function without really referring to the *ability* of any specific group of people. Taking the statement as a simple expression of epistemic possibility, then, renders the statement not only more generally intelligible but also more consistent with the rest of Geisler’s testimony, which, as we have seen, has many examples of generalized notions of possibility and necessity expressed in indirect or idiomatic ways.

### **Could**

Although Geisler uses “could” epistemically ten times, nine of these uses are dedicated to broadening the definition of religion, by now recognizable as perhaps his most frequently deployed strategy. In a single remaining statement, he tries to articulate the limits of methodological naturalism, a less frequently used though similarly significant argumentative move. Since these moves evince the parallel purposes of attacking evolution and defending creation science, they can be dealt with together.

Geisler especially uses statements modalized with epistemic “could” to expound on his notion of “ultimate commitment,” which he takes to be the essence of religiosity. One could make a commitment, he asserts, to “a country” or “an ideal,” — whatever one commits oneself to is the object of religious worship. Essentially, Geisler argues, religion is *so broad* that, insofar as every person has some kind of primary value in their lives, everyone has a religion. The only question to dispute is *which* religion one follows. He especially conveys this sense of broadness when he elaborates on what he means by “making a commitment”, observing, “It could be a depth, it could be a commitment to a center, could be a commitment to an outer or it could be a commitment to something moving forward, a progressive evolutionary thing, in which case there are really evolutionary religions.” Putting these layers of abstraction aside, Geisler is basically

arguing, much as contemporary Young Earth Creationists such as Ken Ham do, that any statement about the origins or purposes of human beings constitute religious statements.<sup>336</sup> This broadening of the term religion — just as much as Geisler’s broadening of the term science — allowed Geisler in 1981, just as it allows Ken Ham in 2022, to construe the question of the case less along demarcation lines and more along appeals to equality. For, if everyone has a religion, and evolution is just one option among many, then teaching evolution *without* creation science, or the perspectives of other religions, might indeed constitute a prohibited establishment of religion. While Geisler was never especially precise as which parts of evolutionary theory or creation science might be “purely scientific” or “purely religious,” achieving that precision probably would have required him to admit the religious nature of creation science, an admission he was patently unwilling to make.

### **Might**

Coding Geisler’s statements modalized with “might” brought back the difficulty that distinguishing between epistemic, deontic, and dynamic modality entails. A number of statements that I ultimately coded as epistemic struck me, at a second or third glance, as possibly entailing a deontic or dynamic sense in addition to the epistemic sense. Statements in which a modalized statement introduces indirect speech, such as “I might add” or “I might say,” comprise six of the eleven statements that I ultimately interpreted as conveying epistemic meaning. As I have in previous chapters, when I doubted whether the epistemic sense prevailed in a statement, I attempted to convert it to an impersonal construction beginning with “it is possible for me to <verb>...” or “it is necessary for me to <verb>...”. Successful conversion to such a construction

---

<sup>336</sup> See Jeannie Ortega Law, “Ken Ham: Evolution is a Religion,” *Christian Post*, February 9, 2019, <https://www.christianpost.com/news/ken-ham-evolution-is-a-religion.html> for a summary of how this position is articulated today.

does not guarantee that the epistemic sense predominates over deontic or dynamic senses, but it does add weight to choosing the epistemic interpretation. If I could successfully convert a statement in this way, I would then compare the argumentative and rhetorical implications of deontic or dynamic interpretations when compared to Geisler's testimony as a whole. In this way, I could make practical enough distinctions between the three major modal senses.

Three discrete, by now familiar rhetorical moves are observable, in Geisler's statements modalized with epistemic "might." In these statements, he attempts to characterize evolution as a religion, distinguish between "belief in" and "belief that," and differentiate creation scientists from the Fundamentalists of the 1920s. The rhetorical effect of this grammatical construction, applied to these purposes, is subtle, as it gives the statement contained in the indirect speech the feel of an incidental, off-the-cuff remark. On the whole, this observation tracks with what I have observed earlier — namely, that Geisler seems to be, however unintentionally, deploying a notably more conversational idiom than did Ruse. For instance, Geisler refers to the Julian Huxley's *Humanist Manifesto* to establish evolution as one of the tenets of a "humanistic religion," observing in passing, "I might note first that this is January and February 1962 and on the front page the first article is entitled "The New Religion of Humanism," and that is by Julian Huxley." Modalizing this statement along the line of possibility subtly suggests that Geisler also might *not* note that very statement. In this way, he comes to close to, without quite exemplifying, a figure of negation like paralipsis, in which a rhetor asserts a statement by claiming to deny it.<sup>337</sup>

In another statement modalized with epistemic "might," Geisler constructs an analogy to the popular *Star Wars* film series to explain how one can believe in or refer to God without

---

<sup>337</sup> As in Republican campaign consultant Mary Matalin's August 1992 remark about then candidate Bill Clinton, "We've never said to the press that he's a philandering, pot-smoking draft dodger," and other similar examples. A definition and a series of examples can be found at "Paralipsis," *Manner of Speaking*, August 15, 2011, <https://mannerofspeaking.org/2011/08/15/rhetorical-devices-paralipsis/>.

necessarily being religious. Here, he ventures into some theologically-specific territory that, today, might be considered somewhat more controversial than it was at the time: digression on the devil and the occult. After explaining Plato's concept of the Demiurge, Geisler briefly surveys the historical beliefs of American Christians, and uses their literal belief in Satan to illustrate the distinction between "belief in" and "belief that" to which I referred earlier. Since the paragraph in which he draws this analogy also contains an example of the modalized indirect speech to which I referred above, several of his statements here are worth quoting:

“And I might add that in Christian belief, which includes the belief in the historic sense, historic Christians, who—take, for example, the Roman Catholic, Protestants in the historic sense until the turn of the century in America or just before that, traditionally believed that there was a God and that he had created angels and that some of these angels rebelled and became demons. The leader of this rebellion was called Satan, and they believed that he was a real person who has great powers who can deceive people in the world. The occult is usually connected, as it is in the Scriptures, to this belief that occult practices like moving physical objects through the air such as maybe you might see in ‘The Empire Strikes Back’ Luke Skywalker learning to do this.”

Put a little more simply, Satan believes that God exists, but he does not commit himself to God or worship God. From this infernal perspective, God does not function as a religious object at all. In this way, we can see that Geisler views a statement's religiosity as a quality less of the statement itself and more of what the statement means to the person making it — the statement “God exists” means something different to the Christian who pins his hope for salvation on Jesus than it does to God's eternal adversary. The frankness and sincerity with which Geisler discusses the supernatural here will certainly strike contemporary readers as a little strange. More importantly, though, it marks an important distinction between the rhetoric of creation scientists and that of intelligent design advocates. Eager to avoid accusations of overt religiosity, intelligent design activists never even speak specifically about God, let alone angels, fallen or otherwise — at least in their public statements.

A note on the source of Geisler’s analogy seems warranted as well. In the early 1980’s, the heyday of Satanic ritual panics, conflating Luke Skywalker’s Jedi powers with the occult would not have seemed so unusual. While Geisler himself might not have intended a positive connotation to inhere in his analogy, it’s worth noting that, today, *Star Wars* analogies recur with some frequency in American public discourse. Indeed, a recent search of Fox News’s website revealed a number of headlines in which the phrase “The Empire Strikes Back” is used to characterize the government as targeting white conservatives for everything from their belief in free speech to their opposition to critical theory to, perhaps most unsurprisingly, critical race theory.<sup>338</sup>

Finally, Geisler uses epistemic might to distinguish between creation scientists and the Fundamentalists of the 1920s and 30s. To do this, he distinguishes even within Fundamentalism, suggesting that Fundamentalists prior to the Scopes Trial did not have the same anti-intellectual attitudes that have come to be historically associated with the movement. As he puts it, deploying the indirect speech construction discussed above, “I might add that the thing that characterized these later fundamentalists from the early fundamentalists not only were they militant and anti every kind of evolution, but they were narrow and often bigoted and were people who I think really brought disrepute on the full cause of the earlier fundamentalists who were educated.” These “earlier Fundamentalists” were the authors of books like *The Fundamentals*, and, to the extent that Geisler considers the creation science movement descended from them at all, it is with these earlier Fundamentalists that he hopes to start the line of descent.

## Should

---

<sup>338</sup> Search Results, April 29<sup>th</sup>, 2022, <https://www.foxnews.com/search-results/search?q=empire%20strikes%20back>

Although Geisler only uses epistemic should a single time, he does so in a statement essential to the broad definition of religion that allows him to claim, among other things, that belief in evolution is itself a species of religious belief. In this way, he contends that teaching evolution *without* scientific creationism might itself constitute an unlawful government establishment of religion, though Geisler is somewhat vague about *which* religion is established. Although he speaks of evolution itself as a religious idea, he also speaks of it as a component of the religion he refers to as “humanism,” which will not sound unfamiliar to those familiar with today’s right-wing activists who decry the “secular humanism.”<sup>339</sup> Referring to the “Death of God” movement, a mid-20<sup>th</sup> century movement within theology, Geisler uses epistemic “should” in an metaphor that he uses to distinguish between “transcending up” and “transcending down,” though this terminology is somewhat idiosyncratic. Suggesting that even nonbelief can be a kind of religious commitment, he observes, “Someone satirized it by saying we should probably take the steeples off of the churches and make cisterns now because they were transcending in depth.” The synecdoche — the use of the steeple to represent belief in God and a cistern to represent nonbelief — allows Geisler to present belief and non-belief in God as two poles on the spectrum of religious commitment. In this way, he not only sidesteps the rhetorical nets of the conflict thesis, but also offers another early example of discursive tropes that have now become typical.

A relatively new part of anti/counter-expert discourse at the time, labeling a perspective a religion has been one way in which more contemporary activists have taken advantage of the conflict thesis’s rhetorical legacy — notably, in ways that don’t serve the purposes of either “science” or “religion”, however broadly these terms are construed, but of political operatives.

---

<sup>339</sup> See, for instance, “Secular Humanism: What is it?” *Christian Answers*, <https://christiananswers.net/q-sum/sum-r002.html>, which defines the term as a “religious worldview.” Significantly, this site cites the same *Humanist Manifesto* to which Geisler referred in his testimony for its examples of what it means by the term.

As discussed in the introduction to this dissertation, for instance, teaching about race in American history is now portrayed by its opponents as part of the “woke religion” that is now being established in American schools. These appeals, while facile and more than a little absurd, are also extremely efficacious — just as similar appeals were among creation scientists before, during, and after *McLean v. Arkansas*.

## **Will**

Although Geisler modalizes four statements with epistemic “will,” one of those statements is simply a comment upon some of the notes in front of him, so it will not be considered here. Of the three remaining statements, each serves a distinct purpose, though all are, by now, argumentative moves that we have seen him make a couple of times. In one statement, Geisler quotes from the *Humanist Manifesto* to try to establish evolution as a religion. In another statement, he uses an analogy to try once again to establish his “belief in” and “belief that” distinction. Since I have already discussed these efforts as rhetorical moves, I will instead focus on the sole appearance of an appeal that, in Chapter 2, was one of the distinguishing argumentative tactics of William Jennings Bryan — more specifically, an appeal to a fact/theory distinction. This appeal, though widely present in the contemporaneous discourse of creation scientists, appears only this one time in Geisler’s testimony. Asked by Campbell to define the term “scientific model,” Geisler contends “a scientific model is a construction. We’ve all seen these charts in books, either Creation books or evolution and there will be lines drawn between the various species on the chart...There aren’t any lines there. Those lines exist only in theories or constructs or models that scientists put on them.” By emphasizing the contingency of theories as compared to the solidity of “facts,” Geisler not only tries to establish parity between creation science and evolution, he also subtly subordinates the concept of “theory” to the concept of

“fact.” This, of course, had been an appeal made by anti-evolutionists since the very earliest Fundamentalists had begun agitating against teaching evolution.

Compared to this appeal’s prominence in the popular discourse of creation scientists, its rarity in the testimony of the defense team’s lead expert witness stands out. The technical as opposed to popular discourse constraints of the court room, however, might explain why Geisler did not make this appeal with the same frequency as Henry Morris and Duane Gish. Because the latter men primarily tilted for creation science in less formal discourse situations, such as debates on college campuses, they could get away with the terminological bait and switch that lies at the bottom of the spurious way in which creation scientists differentiated fact from theory. The inherently more technical nature of the court room, however, and the guarantee that credentialed scientists would have the chance to respond to this appeal, no doubt lessened its potential efficacy and may, though we can hardly be sure, account for its relative absence from Geisler’s testimony.

### **Must**

In three statements modalized with epistemic “must,” Geisler contends that the nature of concepts like cause-and-effect essentially require that we postulate a creator. Consequently, creation science becomes “scientific” by definition and evolution, which Geisler has consistently construed as atheistic, becomes non-scientific at best and anti-scientific at worst. More specifically, he refers to both Aristotle and Aquinas’s versions of the cosmological argument while conflating their distinct concepts of God. Summarizing Aristotle’s views, Geisler basically restates the main premise of the cosmological argument, saying, “if there are things that are moving in the world, there must be a cause of that Motion and ultimately, since you can’t have an infinite regress of causes, there must be a first unmoved mover.” To Aquinas, Geisler

attributes a similar view, passing over any philosophical or theological distinction between Aristotle's detached "unmoved mover" and Aquinas's very undetached, imminently incarnated notion of God. Indeed, he even identifies his own view as that of Aquinas, remarking, "my own view from a philosophical standpoint is very similar to that of Thomas Aquinas...who said that if every event has a cause, then there must be an ultimate first cause of the universe, because you can't have an infinite regress of causes; therefore, it's necessary to postulate an ultimate first cause." Having invoked the support of ancient authority — a tried and true trick of the theologian's trade — Geisler can now suggest that refusing to afford creation science the status of a full science violates the very principles of reason that lie at the foundation of the scientific enterprise.

### **May**

Although Geisler uses epistemic "may" twice, he does so in a single statement in which, interestingly enough, he draws an analogy to justify distinguishing between "historical science" and "observational science," a distinction often made by today's Young Earth Creationists and intelligent design proponents alike. According to Geisler, observation, measurement, and the empirical tests that constitute the toolkit of methodological naturalism are useful only in measuring things happening in the present. This is what he calls "observational science." Historical science, meanwhile, deals with things that happened in the past, and its methods, comprised of analogy, inference, and the logical modalities. Significantly, this framework places "questions about origins" within the realm of historical science. While Geisler ignores that most evolutionists present evolution as a theory about the development rather than the origins of life, that is somewhat beside the point. His way of putting it, which includes his only two uses of epistemic "may," is worth quoting in full:

“Say, for example, a dictionary is normally produced by intelligent activity, not an explosion in a printing shop...Now, you take that kind of analogy and you apply it toward the beginning. But you can’t be absolutely sure. It may or may not apply. Analogy, inference built on present observation and experience.”

When Geisler draws this analogy and then uses epistemic “may” to make room for the possibility of its truth, he doesn’t just anticipate the doubt-mongering of scientific data and expertise that now function as stable tropes in right-wing discourse. He also anticipates the kind of arguments that intelligent design activists will use nearly 25 years later in *Kitzmiller v. Dover*. Specifically, they will argue that the laws of nature, taken as a whole, are analogous to artifacts like dictionaries, watches, and mouse traps, all of which, by virtue of being highly ordered and purposive, betray the hallmarks of intelligence and thus justify an inference to an “intelligent designer.” At the same time, though nearly all ID activists are American Christians, they maintain a strategic ambiguity about the identity of the designer, going so far as to assert that the designer could even be a race of intelligent space aliens. Indeed, one of Geisler’s fellow defense experts, Chandra Wickramasighe, suggested that similar beings might also have designed the earth and left behind scientific evidence behind for humans to find so that they might one day discover their ultimate origins. This was not, of course, a position held by Geisler, Henry Morris, or any of the leaders of creation science organizations, but it was a way in which they could, at the very least, maintain plausible deniability with respect to the overt religiosity of their claims.

#### **Between *McLean and Edwards***

Less than a month after the trial commenced, Ronald Reagan’s second year as president was preceded by the release of Judge Overton’s decision, which struck down Act 590, on January 5<sup>th</sup>, 1982. In a written opinion immediately reprinted in such illustrious scientific journals as *Nature*, Overton, citing Ruse’s five essential characteristics of science and Act 590’s legislative history, determined both that creation science in general failed to meet the

demarcation criteria necessary for science and that Act 590 in particular entailed an unconstitutional government establishment of religion.

The defendants in *McLean* offered several explanations for their loss, most of which amounted to alleging an almost conspiratorial level of bias and collusion between the media, mainstream scientists, and the legal system, in particular on the part of the Arkansas State Attorney and Judge Overton. By means of such accusations, creation scientists could continue to maintain essentially the same positions and stance that they had assumed during the trial. In his retrospective account of the trial, for instance, Norman Geisler complained that “the media reporting was largely *slanted*” because the case “was pitched to the ‘religion vs. science’ theme even before the trial began.”<sup>340</sup> Similarly lamenting the bias he perceived from the scientific and legal establishment, Geisler offered everything from “twisting and distorting of the facts” on the part of ACLU attorneys to Judge Overton’s being “overtly biased against creationism” in the opinion.<sup>341</sup> These tropes, of course, remain common in contemporary right-wing complaints about the media and legal system, both in general and where legal controversies over origins are concerned. A more thorough and less partisan analysis of news coverage of the case, however, suggests that the media coverage, on the whole, benefitted creationists in general and creation scientists in particular because it largely accepted the frame for the debate promulgated by creationists. More specifically, “the news coverage...mostly depicted the creationists as a beleaguered but sincere minority only seeking fair play for their somewhat untraditional scientific ideas.” Scientists, meanwhile, “were often described as ‘angry’ or as ‘scornful’ of

---

<sup>340</sup> Norman Geisler, *The Creator in the Courtroom: The Controversial Arkansas Creation-Evolution Trial*, (Mott Media: Milford, MI, 1982), 13.

<sup>341</sup> *Ibid*, 24.

creationists' arguments."<sup>342</sup> A number of explanations for the disparity between the perception of persecution by the media on the part of creationists with respect to the reality of the media's preference for them seem possible, but the simplest seems to be that it makes for the most dramatic, exciting story, a win-win for both media institutions and advocates for creationism of all kinds. Compounding the generally favorable viewpoint of the press toward the creation scientists, the creation science movement was also generally supported by the *readership* of Arkansas newspapers, suggesting further evidence of the popular support reported by contemporaneous polls. Indeed, the rhetoric of creation science supporters in 1981 and 1982 seems strangely anticipatory of the brand of populist rhetoric often deployed by the right-wing in its 21<sup>st</sup> century crusade against critical race theory, masks, and vaccines. Supporters for evolution, for instance, were often described by Arkansas citizens through epithets like "elites," and depictions of evolutionary biologists as a Satanic or Marxist cabal were as common<sup>343</sup> as similar depictions of mask-wearing Americans or CDC doctors have been in the latter days of the COVID-19 pandemic.<sup>344</sup>

Despite losing in the courtroom, then, creation scientists and their allies remained largely undeterred in the public sphere. Nor has the legal defeat of creation science spelled the end of legislation requiring "both sides" of a controversy to be discussed. In 2021, for instance, Texas, previously discussed for the bitter debate over creation science textbooks waged there, passed

---

<sup>342</sup> Marcel C. La Follette, "Creationism in the News: Mass Media Coverage of the Arkansas Trial," in *Creationism, Science, and the Law: The Arkansas Case*, 194.

<sup>343</sup> See Guy Lancaster. "This Evolution Bit is Straight from Satan": *McLean v. Arkansas Board of Education* and the Democratization of Southern Christianity." *Religion and Education* 33, no. 3 (2006): 82-83.

<sup>344</sup> When I first made this comparison, I thought that I might be exaggerating a little. A quick Google search for the terms "cdc masks satan," however, showed that I was perhaps understating things. Maggie Quinlan, "'Masking is a satanic ritual': Group protests outside Spokane health officer's house over state mask mandate," *The Spokesman-Review*, July 21, 2020, showed me that such analogies remain alive and well in my own state of Washington.

House Bill 3979, which prohibits the teaching of critical race theory.<sup>345</sup> This shows the enduring portability of both the legal strategies and the rhetorical strategies of creation scientists.

---

<sup>345</sup> HB 3979, <https://legiscan.com/TX/text/HB3979/id/2339637>.

## Chapter 5

Like the basic epistemological problems of testimony and expertise discussed in chapter one, the most basic form of the argument made by today’s proponents of intelligent design (ID), the evolution alternative most recently litigated in American courts, probably has antecedents predating the classical era. The Pre-Socratic Anaxagoras, one of the first thinkers recorded to offer a kind of design argument, suggested that, while “matter is governed by its own principles,” it “is shaped and formed to meet the goals of an independent intelligence.”<sup>346</sup> Starting with Plato, however, philosophers began to distinguish between the argument *to* design and the argument *from* design. Taken together, variations of these arguments form the basic principles used by today’s self-labeled “design theorist” to make room for teleological reasoning in science and, more generally, in American public education.

The former argument moves from the observation that the individual parts of organisms seem especially suited to specific purposes to the conclusion that those parts were designed *for* those purposes. That purpose becomes the central organizing principle used to explain why, for instance, the long neck of a giraffe. The giraffe’s neck, accordingly, not only assists it in reaching food but was in fact made *in order* to help it reach food. Distinguishing the fact of design from the inference to a designer, the latter argument reasons from design to a cosmic designer, often divine, and, in the contemporary American political debates, frequently though not exclusively identified with the God of Christianity. Even so, the argument from design predates the birth of Jesus by at least several centuries. In the *Timaeus*, for instance, Plato goes so far as to posit the existence of a “divine craftsman” who fashioned living beings according to

---

<sup>346</sup> Benjamin C. Jantzen, *An Introduction to Design Arguments*, (Cambridge: Cambridge University Press, 2014), 30, discusses Anaxagoras’s argument in contrast with that of other Pre-Socratics. A more detailed discussion of Plato’s argument is also provided.

an intentional plan.<sup>347</sup> Plato’s student Aristotle also prominently featured “final causes” in his basic model of logic, though his notion of a disinterested God did not quite accord with Plato’s vision of a Divine Mind.<sup>348</sup> Centuries later, Cicero summarized previous arguments and built on Stoic design arguments in *On the Nature of the Gods*. In the Middle Ages, Thomas Aquinas used Aristotelian metaphysics a design argument now familiar as his “fifth proof” for the existence of God in his *Summa Theologica*.<sup>349</sup> Though these thinkers have supplied the most famous pre-modern design arguments, the most immediate precursor to the arguments made by contemporary ID theorists can be found in *Natural Theology*, the work of Anglican clergyman-scientist William Paley, first published in 1802. This work, though it was accused not long after Paley’s death of plagiarizing the earlier Dutch philosopher Bernard Nieuwenty’s 1721 work *The Religious Philosopher*,<sup>350</sup> spells out the basic moves that 20<sup>th</sup> and 21<sup>st</sup> century design advocates would deploy in such notable public efforts as the “teach the controversy” effort campaign and legal cases such as *Kitzmiller v. Dover*, the final case considered here.

As mentioned earlier, the argument from design begins with the assumption that objects in the world, but particularly living things, have the appearance of design. Proponents of ID would probably characterize the appearance of design as an empirical observation agreed upon by all competent observers,<sup>351</sup> but regardless of the premise’s disputability, this part of the argument acts as the common ground for a number of distinct argumentative moves featured prominently in *Natural Theology*. Among these, perhaps the most famous is what ID proponents

---

<sup>347</sup> See Michael Ruse, *Darwin and Design: Does Evolution Have a Purpose?*, (Cambridge, MA: Harvard University Press, 2003), 12- 17 for a detailed discussion of Plato’s argument from design.

<sup>348</sup> *Ibid*, 19 discusses Aristotle’s notion of teleology.

<sup>349</sup> Jantzen, 47-37 offers an exhaustive survey of design arguments made throughout the Middle Ages and the Early Modern era. Pages 78-117 of the same volume also survey the design arguments and criticisms of the same by Early Modern thinkers like Berkeley and Hume.

<sup>350</sup> See Jantzen, 168-169 for a discussion of the contemporaneous and contemporary plagiarism charge leveled at Paley.

<sup>351</sup> William Paley, *Natural Theology*, (New York: Harper, 1865).

and opponents alike call “the watchmaker analogy,” an argument with which Paley opens the book. The argument goes like this: unlike natural objects such as rocks, which, if one observes in nature, one might suppose had always existed in their present form, objects such as watches, comprised of complex individual parts each fashioned to a specific purpose, demonstrate evidence of design. As Paley puts it, “the inference, we think, is inevitable that the watch must have had a maker: that there must have existed...an artificer or artificers, who formed it for the purpose which we find it actually to answer; who comprehended its construction, and designed its use.”<sup>352</sup> Living things such as humans demonstrate complexity similar to that of the watch. Consequently, humans too must have had a designer, whom Paley, as Aquinas did centuries earlier, identified as the Christian God.

Owing to the Establishment Clause, the identity of the designer in such arguments would become perhaps the most significant — and disputed — component of the *Kitzmiller v. Dover* case. If the claims of contemporaneous and contemporary ID proponents are taken at face value, the identity of designer remains an open question for today’s design theorists to debate, perhaps as openly as evolutionary biologists debate the mechanism of evolution or natural selection. According to the standard narrative supplied by the conflict thesis, which positions *Kitzmiller v. Dover* as the most recent episode in creation-evolution controversy, such claims are to be regarded as simply the most recent attempt by creationists, now presenting themselves as design theorists instead of creation scientists, to circumvent the Establishment Clause by disguising religion as science. According to this narrative, following the defeats of equal time in *McLean* and *Edwards*, creationists needed to repackage their arguments yet again, just as they had repackaged their anti-evolution arguments into creation science. To meet this goal, they

---

<sup>352</sup> Paley, 11.

somewhat hastily removed all references to the Bible from their existing materials, changed references to God into references to an ambiguous “Designer,” and then proceeded pushing the same cultural, political, and religious agenda that they had been pushing for a century. This position, which organizations like the National Center for Science Education have maintained since ID first appeared<sup>353</sup> on the scene, is echoed in the oft-repeated words of physicist Adrian Melott, who called ID “creationism in a cheap tuxedo.”<sup>354</sup> More significantly, this narrative would later be recounted in Judge John E. Jones’s rejection of ID his written opinion in *Kitzmiller v. Dover*.

There is no doubting that the historical development of ID between *Edwards* and *Kitzmiller* supports the standard interpretation. After creation science’s defeat in *McLean* and the Supreme Court’s final rejection of equal time laws in *Edwards v. Aguillard*, it seemed once again that challengers to evolution had gone extinct. But like all evolving organisms, ideas mutate and adapt to their environments. Just as the intellectual edifice of creation science was incipient in the years leading up to anti-evolutionism’s ultimate legal defeat in *Epperson*, so too were the epistemological and “scientific” foundations ID lain in the interim between *McLean* and *Edwards*. For instance, while several of the major arguments associated with ID, such as the watchmaker analogy, first made their first 20<sup>th</sup> century appearances in the 1984 work *The Mystery of Life’s Origins*, it was not until the early 1990’s that such arguments were explicitly disassociated from creation science and explicitly associated with the term “intelligent design”,

---

<sup>353</sup> See, for instance, NCSE director Eugenie Scott’s lecture “Creationism: Still Crazy After All These Years,” <https://www.youtube.com/watch?v=ECpV0-RBWLw>.

<sup>354</sup> Adrian Melott, “Intelligent Design is Creationism in a Cheap Tuxedo,” *Physics Today* 55, no. 6 (2002): 48.

which had begun to emerge as the American education system's next organized opponent to Darwinian evolution.<sup>355</sup>

Indeed, ID's "genesis" as a bona fide political and intellectual opponent occurring not only after — almost immediately after — creation science's defeat likewise seems to support the standard interpretation. In 1991, only four years after the Supreme Court had ruled in *Edwards*, UC Berkeley law professor Phillip Johnson, following a divorce and subsequent spiritual crisis, published *Darwin on Trial*, a book that attempts to use the techniques of a trial lawyer to demonstrate the inadequacies of Darwinian evolution and advocated ID in its place. As used by Johnson and other prominent ID proponents such as Michael Behe and William Dembski, the term "intelligent design" refers to the thesis that living organisms display signs of intentional, purposeful arrangement that can either best be or only explained by positing an "intelligence" that deliberately designed, created, and then arranged each organism's various parts into a functional, coherent whole. From this definition and their consequent assessment of contemporary American politics and scientific culture, design theorists condemn methodological naturalism, which they claim necessarily entail a baleful more general philosophy called "scientific materialism." Echoing prior critics of evolution, Johnson claimed that this philosophy necessarily devalues human life and misrepresents the kinds of questions that the scientific method possesses the capacity to answer. More specifically, he rejects what he perceives as "the reduction of human life to material causes." In place of evolution by natural selection, he proposed intelligent design, which he took to explicitly suggest that not only were human beings the product of the intelligent acts of an unidentified designer, but that one can observe scientific

---

<sup>355</sup> Edward Caudill, *Intelligently Designed: How Creationists Built the Campaign Against Evolution*, (Urbana, Chicago, and Springfield: University of Illinois Press, 2013), 70-71.

evidence for the theory in controlled laboratory settings.<sup>356</sup> Soon after Johnson published *Darwin on Trial*, he was featured prominently at a 1992 conference at Southern Methodist University, where Johnson sold ID as a means to combat the threat of materialism and to make the culture more amenable to Christian morality, which he and many of the allies he gathered at the conference took to be under threat.<sup>357</sup> In ID proponents' frequently repeated condemnations of the "materialistic" implications of contemporary evolutionary theory and, by extension, the paradigm dominating contemporary scientific research, echoes of antievolutionism and creation science were perceived.

While these facts allowed a convincing and, more importantly, legally useful rhetorical strategy to be constructed, construing ID as simply repackaged scientific creationism, itself just repackaged antievolutionism, also has significant limitations. For one, framing the debate in these terms has always involved ignoring key distinctions between the anti-evolutionism, creation science, and intelligent design and their corresponding social movements and *moments*. This can particularly be seen in the flattening of distinctions between the claims of scientific creationists and those of ID theorists. The standard narrative ignores not only conceptual differences like ID's general silence on such issues as the age of the earth but also personal disagreements like Henry Morris's contention that ID was just a way for avowed Christians to get around intellectually troublesome parts of the Bible. Of particular note, Morris condemned ID theorist's refusal to name the designer, often cited by ID opponents as a canard used to avoid admitting to ID's religious nature, as "nonsense" and cited it as a reason for viewing ID as

---

<sup>356</sup> Phillip Johnson, *Darwin on Trial*, (Lanham, MD: Regnery/Gateway, 1991): 17.

<sup>357</sup> Barbara Forrest and Paul R. Gross, *Creationism's Trojan Horse*, (Oxford University Press, 2004) provides the best account of the early work of Johnson and other ID activists. Most usefully, it documents the explicitly religious idiom in which ID arguments were often made.

*opposed* to creation science.<sup>358</sup> Without disputing the strategic usefulness of conflating these ideas in the adversarial courtroom environment, scholars can now observe, with the useful distance of time, that anti-evolutionism, creation science, and intelligent design are, despite their common historical antecedents, really not identical concepts.

Although most scholars reject ID supporters' attempt to distinguish ID from creation science or antievolutionism, they do by pursuing an "appearance-reality" line of argument that, to be honestly considered, must be acknowledged as just as strategic of a choice as ID supporters' attempts to portray ID as science. Proponents of ID like Johnson argue that, unlike the antievolutionism of William Jennings Bryan or the creation science of Henry Morris, their theory offers a challenge to evolution wholly without reference to Christianity, the Bible, or, indeed, any particular religion. Indeed, it is worth noting that, shortly after the publication of Johnson's book, Henry Morris characterized ID as a way for people who wanted to appear scientifically respectable to avoid dealing with the flood account of Genesis, and he especially rejected one of the central claims of ID proponents: that the designer need not be God.<sup>359</sup>

Recognizing the limitations of the standard conflict-thesis narrative, I suggest again that this more particular mistake lies in viewing the conflict as primarily stemming from disagreement about abstract concepts instead of disagreement about the general nature of scientific expertise and, more importantly, about the role of the level of certainty performed by a given expert witness.

Given the rising of tide of anti-expert rhetoric in general, I also suggest that reframing the debate as one about different views of expertise instead of the more general concepts of science

---

<sup>358</sup> See Ronald Numbers, "Clarifying Creationism: Five Common Myths," *History and Philosophy of the Life Sciences* 33, no. 1 (2011): 135-137 for a brief, useful discussion of the conceptual differences between creation science and ID.

<sup>359</sup> Numbers, *The Creationists*, 377-378.

and religion will help experts themselves be more efficacious public communicators. Teachers of sciences integral to evolutionary theory, such as geology, have also observed that the oversimplified, conflict-thesis informed narrative, not only misrepresents key distinctions between creation science and ID, but also impedes the ability to facilitate dialogue between experts and the public. This is especially true when, as was the case with ID around the time of *Kitzmiller v. Dover*, the views of experts and those of the public generally do not align. As geologist Marcus R. Ross, failing to properly attend to this disconnect between expert and public opinion “can create barriers to constructive discussion, not only in the classroom but also in policy-making forums.”<sup>360</sup> It has been more than fifteen years since *Kitzmiller v. Dover* was decided, but the tide of anti-expert and counter-expert rhetoric has only risen, especially since the COVID-19 pandemic began. Recognizing the distinctions between anti-evolutionism, creation science, and intelligent design by turning to the expert testimony delivered in *Kitzmiller v. Dover*, I argue that that contemporary experts should view their testimony as only one of many kinds of evidence.

### **Selling Intelligent Design**

Following the defeats of creation science in *McLean* and *Epperson*, many might have assumed the final legal, if not cultural, debate to have been won by supporters of evolution. Then, in 1991, the intelligent design movement began with the publication of University of California at Berkeley Law Professor Phillip Johnson’s book *Darwin on Trial*. According to Johnson, intelligent design theory constitutes not only a scientific challenge to this concept of scientific methodology, but also a cultural challenge to what he attacks as the atheistic

---

<sup>360</sup> Marcus Ross, “Who Believes What? Clearing Up Confusion Over Intelligent Design and Young-Earth Creationism,” *Journal of Geoscience Education* 53, no. 3 (2005): 319. This article also offers a useful typology of the different varieties of creationism, providing a very clear set of criteria for distinguishing between them.

implications of Darwinian evolution. With this book, the movement that would once again draw international attention to a rural American town began.

As support for Johnson’s ideas spread rapidly among religious conservatives, the Discovery Institute, a Seattle-based think tank originally dedicated to sponsoring research into transportation policy, jumped on board. In 1996, it opened the Center for the Renewal of Science and Culture” (CRSC).<sup>361</sup> The CRSC claims to “to counter the materialistic interpretation of science by demonstrating that life and the universe are the products of intelligent design and by challenging the materialistic conception of a self-existent, self-organizing universe and the Darwinian view that life developed through a blind and purposeless process,” the Discovery Institute has acted as the main sponsor of ID “research.”

Throughout the 1990s and early 2000s, the Discovery Institute worked to “wedge” ID into the technical, popular, and political spheres of discourse.”<sup>362</sup> The term “Wedge” in this context refers to the “Wedge Document”, a Discovery Institute memo composed in 1998 and leaked in 1999. This document, now hosted on the website for the National Center for Science Education, discusses the Discovery Institute’s efforts to combat the very same “materialism” that Johnson first condemned in *Darwin on Trial* in explicit, specific terms.<sup>363</sup>

The Wedge Document, which itself became a subject of much discussion during the *Kitzmiller* trial, asserts the existence of a long line “thinkers such as Charles Darwin, Karl Marx, and Sigmund Freud portrayed humans not as moral and spiritual beings, but as animals or machines who inhabited a universe ruled by purely impersonal forces and whose behavior and very thoughts were dictated by the unbending forces of biology, chemistry, and environment.

---

<sup>361</sup> Numbers, *The Creationists*, 381.

<sup>362</sup> The Discovery Institute, “The ‘Wedge’ Document: So What?”, <https://www.discovery.org/m/2019/04/Wedge-Document-So-What.pdf>.

<sup>363</sup> Center for the Renewal of Science and Culture, “The Wedge Document,” <https://ncse.ngo/wedge-document>.

The ideas of these thinkers, which have in the present “infected virtually every area of our culture, from politics and economics to literature and art,” all have materialism at their core.<sup>364</sup> Consequently, design theorists hoped that ID might act as a cultural corrective. The Wedge Document spelled out a three-phase plan for popularizing ID in American culture, a plan that, in their terms, would terminate in “spiritual and cultural renewal” that includes, to name just a few things, the replacement of “materialistic explanations with the theistic understanding that nature and human beings are created by God.”<sup>365</sup> In the first phase, ID proponents would use “scientific research, writing, and publicity” to initiate a “scientific revolution” by “supporting vital writing and research at the sites most likely to crack the materialist edifice.” This effort included publishing the books of scholars such as Johnson in addition to those of other ID activists such as Michael Behe, Stephen Meyer, and William Dembski. Once enough scientific controversy had been generated, ID proponents would engage in “publicity and opinion-making.” Through efforts to publicize ID in “print and broadcast media, as well as think tank leaders, scientists and academics, congressional staff, talk show hosts, college and seminary presidents and faculty” the Discovery Institute hoped to introduce ID to the broader culture of non-scientists. In the third and final phase, aggressively labeled “cultural confrontation and renewal,” ID’s allies would engage in direct confrontation with their opponents, supporters of evolution. As described in the Wedge Document, they would meet supporters of “materialist science” at events such as academic conferences while pursuing “legal assistance in response to resistance to the integration of design theory into public school science curricula.” In this way, materialist evolutionists would be drawn into an open debate that, presumably, ID’s supporters would win.

---

<sup>364</sup> Ibid, paragraph 3.

<sup>365</sup> Ibid.

Fellows of the Discovery Institute maintained a four-pronged effort, working in concert with lawyers, lawmakers, and schoolboards, in their efforts realize the Wedge Strategy. They sought to alter state textbook standards, introduce Federal legislation mandating the teaching of ID, place “evolution disclaimers” on textbooks mentioning evolution, and generate controversy over local and state adoption of textbooks mentioning evolution in an effort to “wedge” ID into the mainstream discourse and curriculum.<sup>366</sup> In Kansas, for instance, ID activists managed to convince the Kansas Board of Education to remove evolution from state standards and tests, and, although this move was later rescinded, it was accompanied by an effort to include ID in the state curriculum that only defeated after a nationwide campaign ridiculed the state.<sup>367</sup> Complementing these state-level efforts within the Federal government, Senator Rick Santorum, a future candidate for President, introduced in 2001 “the Santorum Amendment” to the infamous No Child Left Behind Act. This amendment would have had the Federal government declare that students be taught to distinguish “good science” from claims made “in the name of science” and require that students be taught to understand the “scientific controversy” surrounding evolution.<sup>368</sup> Borrowing language almost exactly from The Discovery Institute in defending the amendment, Senator Santorum, claimed before the Senate that “there are disagreements in scientific theories out there that are continually tested. Our knowledge of science is not absolute...We continue to test theories. Over the centuries, there were theories that were once assumed to be true and have been proven, through further revelation of scientific investigation and testing, to be not true.”<sup>369</sup> While this amendment failed to become law, its having been

---

<sup>366</sup> See Matthew J. Brauer, Barbara Forrest, and Steven G. Gey, “Is It Science Yet?: Intelligent Design Creationism and the Constitution,” *Washington University Law Quarterly* 83, no. 1 (2005): 106-119 for a detailed discussion of these four distinct types of efforts made by ID activists to impose ID on various parts of the United States.

<sup>367</sup> *Ibid*, 108-109.

<sup>368</sup> *Ibid*, 111.

<sup>369</sup> 107th Cong. Rec. S6148 (2001) (statement of Sen. Rick Santorum).

proposed shows that although design theorists have failed in every way to gain traction among the scientific community, they have not been wholly unsuccessful outside the scientific community. Similarly, while still just a Representative, future Vice President Mike Pence later declared in a speech on the House floor that “only the theory of intelligent design offers a rational theory for the known universe.”<sup>370</sup> State and Federal curriculum change and legislative efforts, however, were only the first two blows made by the Wedge Strategy.

Although somewhat more successful in placing disclaimers on textbooks and generating controversy over the adoption of books mentioning evolution, the Wedge Strategy found the edifice of “scientific materialism” considerably more difficult to split than perhaps its proponents had imagined. In 1996, for instance, Alabama began placing disclaimers on all biology textbook used in public schools, a practice that remains in effect despite a 2016 campaign to pressure the state to remove them. In 2002, the school board of Cobb County, Georgia, likewise voted to adopt a disclaimer appealing to the colloquial definition of “theory,” by then a tactic tried and tested for nearly a century.<sup>371</sup> Although the school board would be sued for this, the case would not be decided until after Jones’s decision in *Kitzmiller* had been issued. Meanwhile, in ID proponents sought in 2004 to convince the Texas State Board of Education, which represents one of the largest textbook markets in the United States, to include criticism of evolution in its curriculum and state standards. Wherever they went, like their anti-evolution and creation scientist forebear, ID proponents encouraged educators to “teach the controversy” over evolution, operating, it seems, under the philosophical axiom that one should throw spaghetti

---

<sup>370</sup> See User clip: mike pence on evolution, <https://www.c-span.org/video/?c4617037/user-clip-mike-pence-evolution> for a video of the speech in which, despite design theorists refusal to acknowledge the designer as God, Pence quotes the Bible and also attributes belief in intelligent design to “every single signer of the Declaration of Independence.”

<sup>371</sup> Ibid, 115-116.

against a wall to see what sticks. As they would learn in *Kitzmiller v. Dover*, though, the wall in the case was the wall of separation between church and state, one to which even the most intelligently designed spaghetti would fail to stick.

Today, the Discovery Institute, members of which were in contact with the Dover School Board and which likewise filed an amicus brief on behalf of the defense, counts among its mission the support of research “challenging various aspects of neo-Darwinian theory...developing the scientific theory known as intelligent design...[and]exploring the impact of scientific materialism on human culture...” This mission includes, in part, funding and promoting research into ID.<sup>372</sup> Apart from these general goals, the most significant expression of The Discovery Institute’s mission can be found in the last plank of its mission statement, which articulates the organization’s goal of promoting a very specific notion of Western culture. As the Institute’s website puts it, “conceived by the ancient Hebrews, Greeks and Christians, and elaborated in the American Founding, Western culture has encouraged creativity, enabled discovery and upheld the uniqueness and dignity of human beings.”<sup>373</sup> Since its founding, the CRSC at The Discovery Institute has been the most vocal institutional proponent of intelligent design in the United States. Despite its failure to win the day in *Kitzmiller*, The Institute continues to operate and fund research into intelligent design today. More recently, the Discovery Institute helped to establish the BioLogic Institute, which describes itself as “a non-profit research organization founded...for the purpose of developing a new approach to biology,” one that begins with “the idea that life appears to have been designed because it really was designed.”<sup>374</sup>

---

<sup>372</sup> Frank Ravitch. *Marketing Intelligent Design: Law and the Creationist Agenda*. (Cambridge: Cambridge University Press, 2011), 18.

<sup>373</sup> Discovery Institute. Mission. <https://www.discovery.org/about/mission/>.

<sup>374</sup> BioLogic Institute. About. <https://www.biologicinstitute.org/about>.

Understanding why *Kitzmiller v. Dover* caused such intense controversy requires examination of several distinct but related issues. Unlike *Scopes* or *McLean*, cases that occurred when the American public generally displayed more hostility to Darwinian evolution, *Kitzmiller v. Dover* occurred within a cultural frame that generally accepted Darwinian evolution. More significantly, the case occurred after the Supreme Court had replaced the Frye Rule with the Daubert Rule, the rule governing expert witness testimony that remains binding to this day. Within such a cultural and legal frame, design theorists have had to bend both their scientific and their non-scientific arguments to participate in a fight in which they are clearly the underdogs. Their rhetorical moves have not, of course, come without criticism, and fully appreciating the dynamics of the case requires some knowledge of how design theorists' arguments have been both made and received. With these debates in mind, we can appreciate how intelligent design's legal problems have roots in more general philosophical and cultural problems, particularly the familiar problem of demarcation. Unlike *McLean*, a case in which the distinction between the "natural" and "supernatural" elements of the arguments were obvious, *Kitzmiller v. Dover* presents a case in which this distinction was – at least according to some – considerably less obvious.

### **A New Mutation: The Rhetoric of ID**

With intellectual and institutional support, design theorists developed a host of arguments to attack the "scientific materialism" entailed by Darwinian evolution while also defending ID as a concept that falls within the bounds of scientific demarcation. While some of these arguments were expressed in scientific terms, others depended on characterizing the public debate over ID itself, a characteristic that will surprise no one familiar with the rhetoric deployed by creation scientists leading up to and following *McLean*. Well-known scientific arguments constructed in

support of ID, all of which efface structural resemblance to the argument from design advanced by Paley, include the argument from “irreducible complexity” and the argument from “specified complexity.” Non-scientific arguments, meanwhile, depend upon depicting the very debate over ID as a situation in which a bold, perhaps too courageous underdog stands up to an established, well-supported challenger, a contemporary David and Goliath story. Frequently comparing themselves to such well-known scientific luminaries as Galileo and Einstein, ID theorists deployed such analogies to suggest that it is only a matter of time until, just as Copernican astronomy replaced the theories of Ptolemy, just as the theories of Einstein replaced those of Newtown, ID will, in due time, replace evolution as the dominant paradigm in both the scientific literature and the broader culture of the United States. Scientists, philosophers, and rhetorical critics alike, however, have vocalized objections to all of these claims, and as a result ID has failed to achieve much traction in either field. The result of this technical and cultural debate, which peaked with *Kitzmiller v. Dover*, has effectively resulted in ID’s natural selection out of the mainstream intellectual milieu.

The scientific argument for ID depends in a large part on a collection of general and specific analogies. Echoing Paley, design theorists assert that human biology can be conceptualized as a complex machine from which removing any part would disable the function of the whole. Just as the design of machines can be inferred from the fact that each part, such as the hinge, performs a specific function relative to the machine’s total operation, so too can the design of the human body be inferred from the appearance of similar functional specification of its parts, such as the eye, which design theorists assert, though not typically with explanation, could only have arisen as a totality rather than as a series of individual parts. From this, which is

labeled the *appearance* of design, ID proponents infer the *presence* of design, contending that random mutation does not offer a plausible explanation for the appearance of design.

Examples of this principle, they contend, can be found everywhere. Design theorists love pointing, for instance, to everyday objects like mousetraps. As Behe asserts in *Darwin's Black Box*, if any one part of a mousetrap — a spring, for instance — is removed, the entire thing stops working.<sup>375</sup> The problem with this analogy, of course, is one of the gaping holes in the more general argument from design — namely, that a machine, just like a biological object, can have several functions. As biologist Kenneth Miller, whose testimony in *Kitzmiller v. Dover* will later be analyzed alongside that of Behe, comically demonstrated in a debate about ID on the PBS show *Firing Line*, a mouse trap can also be used as a tie clip, but no one asserts that it was designed specifically for that function.<sup>376</sup> When a machine, or a body part for that matter, has more than one function, how then to determine *which one* it was designed for? This question, hardly answered sufficient in the literature before *Kitzmiller*, became especially important in the expert witness testimony delivered at the trial.

Machine metaphors are also used to support more specifically biological notions, such as Behe's concept of irreducible complexity. In *The Mystery of Life's Origins*, for instance, bacterial flagella, are described as “outboard motors” that allow bacteria to “swim.”<sup>377</sup> These verbal metaphors are accompanied by visual metaphors that reinforce the more basic machine metaphor, such as a depiction of a “blueprint” for the flagella, the construction of which are compared to building a house.<sup>378</sup> The significance of these metaphors lies not only in the general

---

<sup>375</sup> Behe, 42.

<sup>376</sup> “A Firing Line Debate: That the Evolutionists Should Acknowledge Creation,” *Firing Line*, PBS, December 4, 1997, <https://youtu.be/ITqjIQU-fbA>.

<sup>377</sup> Gunnar E. Höst and Gustav Bohlin, “Engines of Creation? Intelligent Design, Machine Metaphors and Visual Rhetoric”, *Leonardo*, 48, no. 1 (2015): 80.

<sup>378</sup> *Ibid.*, p. 81.

comparison of the flagella to the machines, but also in the specific machines to which the flagella are compared. A motor and a house, for instance, each evoke Behe's central argument in favor of irreducible complexity: that if any one part were removed, the whole would cease to function.

In the absence of a more compelling explanation, design becomes the default conclusion when chance must be rejected. Consequently, machine metaphors frequently appeared, both before *Kitzmiller* and now, in the rhetoric of ID activists. Descriptions of the cell as a "molecular machine," for instance, appear several times in the 2004 film *Unlocking the Mysteries of Life*, which aired on many PBS stations across the United States. These metaphors, despite leading to erroneous conclusions, have much persuasive force because, as Doren Recker has observed, "moving from machinelike natural properties to humanlike creators as their source" appeals to intuitive cognitive processes by which the human mind assigns agency.<sup>379</sup> Even though the vast majority of scientists reject outright the conclusions of ID activists, then, defeating their claims entails a much more challenging task than simply explaining their errors.

With respect to the scientific arguments offered in favor of intelligent design, none stands out more than the idea of "irreducible complexity," a term first coined in 1996, the same year as the CSRC's founding, in Lehigh University biochemist Michael Behe's book *Darwin's Black Box*. Here, Behe argues that some life forms have parts so complex that they cannot be reduced to simpler parts. Particularly, design theorists point to the flagellum, the microscopic "tail" by which some bacteria move themselves as an example of one such part. Like the watch or the eye that featured so significantly in Paley's argument from design, flagella are claimed to be impervious to any further reduction from whole to part, hence the term "irreducible complexity." Observable biological features such as the flagella constitute "a single system composed of

---

<sup>379</sup> Doren Recker, "How to Confuse Organisms with Mousetraps: Machine Metaphors and Intelligent Design," *Zygon* 45, no. 3 (2010): 647-654.

several well-matched, interacting parts that contribute to the basic function, wherein the removal of any one of the parts causes the system to effectively cease functioning.”<sup>380</sup> Consequently, supporters of Darwinian evolution, Behe asserts, must either explain how such complex systems arose simultaneously by natural selection (a feat he does not believe possible), or they must concede that Darwinian evolution is predicated upon fatally flawed assumption, and in either case Behe thinks all signs point to design.

Careful to avoid the ghosts of creation science past, Behe never identifies the designer himself, at least in the work he calls scientific. This move allows him to avoid, at least on the face of things, the charge that he has simply repackaged an old argument toward the same old ends as people like Paley. That rhetorical concession notwithstanding, Behe, like Phillip Johnson William Dembski, and other ID proponents, did on more than one occasion identify the designer as the God of Christianity.<sup>381</sup> As the reception of the argument from irreducible complexity reveals, however, even such careful qualification failed to protect him from accusations of surreptitiously cloaking the wine of yesterday’s creation science into a new, naturalistic skin.

This, perhaps, stems from the argument from irreducible complexity’s relatively recent origins, which will surprise no one familiar with the history of anti-evolution and creation science litigation. Indeed, Behe’s coining of the term practically coincided with the founding of The Discovery Institute. Despite the book’s almost universal rejection by the mainstream scientific community, Behe found a sympathetic audience among other advocacy groups such as the Thomas More Law Center, which later worked for the defense in *Kitzmiller v. Dover*. During the *Kitzmiller* trial, Behe himself offered the cornerstone expert testimony on behalf of the

---

<sup>380</sup> Behe., 39.

<sup>381</sup> See Forrest and Gross, 67; 121-122 for a summary of some of the more obvious examples.

defense, and it is his testimony, alongside that of plaintiff's expert and Behe critic Kenneth Miller, that will be analyzed later in this chapter.

To add one more detail, Behe claims that irreducibly complex systems could not have arisen by gradual mutation and evolution because each independent part is needed in its entirety in order for the system as a whole to function. Therefore, he concludes, such systems must have emerged completely formed, with all their parts intact. From here, Behe infers intelligent design. Nine years after its first appearance in print, this argument and Behe's testimony about it played such an important role in the Kitzmiller defense's case that Judge Jones, who would not neglect the argument from irreducible complexity's similarity to Paley's argument from the watchmaker analogy, called it "the scientific centerpiece" of intelligent design.<sup>382</sup> Of course, insofar as irreducible complexity sought to function as the scientific grounding of intelligent design, it failed just as much as intelligent design's other scientific arguments. These arguments, though less well-known than irreducible complexity, nevertheless operate according to similar lines of reason as that of irreducible complexity and offer further permutations of Paley for a 21<sup>st</sup> century audience.

The notion of "specified complexity" offers one such example. Like "irreducible complexity," this idea, born from the pen of another ID fellow, William Dembski, assumes that, given a sufficient level of complexity, an object's "design" not only can but must be inferred. More particularly, Dembski contends that in explaining the likelihood of events, we must begin with one of three possibilities: chance, regularity, and design. Chance events, as the name suggests, occur more or less randomly. Regular events do not always occur, but occur with enough regularity that, given certain information, the likelihood of their occurring can be

---

<sup>382</sup> Jones, John E. "Opinion in *Kitzmiller v. Dover*", 72.

accurately ascertained. Events that occur by design, however, present a more troubling puzzle to him because they occur with such irregularity that they cannot be attributed to a law of nature or some other observable phenomenon, yet possess such characteristics of regularity that attributing them to chance seems impossible.<sup>383</sup> This notion, which biologists and philosophers alike have criticized for both misstating the problem and ignoring solutions already proposed to it, contributed to the second major scientific argument featured in *Kitzmiller v. Dover*.<sup>384</sup> Dembski, however, who was deposed and originally scheduled to testify in the trial, ultimately, along with several of the other experts originally slated to testify for the defense, did not do so. The reasons for this will be discussed during my synopsis of the trial. Even so, the other expert witnesses for the defense and Jones himself alluded to the argument throughout the trial. But with their scientific arguments seemingly defeated before the trial even began, ID proponents turned to other resources to make their case. They found the resources they needed by redirecting people toward the rhetorical features of the scientific debate surrounding ID.

Design theorists thought they had found the opening they needed when they began characterizing themselves as unfairly marginalized by a scientific community controlled more by the cultural agenda of materialism than by an objective search for truth. Tapping into widely held American notions of individualism and casting themselves as the lone voices of truth amidst hostile institutions, design theorists characterized the intellectual climate of scientific debate as dishonest and biased. Through such strategies, to which Behe and other defense experts appealed throughout their testimony, they exploited the non-scientific assumptions of their audiences, who often respond much more readily to easily understandable narratives than technical scientific

---

<sup>383</sup> Forrest and Gross, 122-125 summarizes this concept as Dembski presents it in his work.

<sup>384</sup> John Wilkins and Wesley Elsberry, "The Advantages of Theft Over Toil: The Design Inference and Arguing from Ignorance," *Biology and Philosophy* 16, no. 5, 2001, 709-722.

argumentation. It is within the terms of this narrative that The Discovery Institute characterizes both intelligent design and design theorists in its official response to the *Kitzmiller* decision, *Traipsing Into Evolution*. In this book, members of The Discovery Institute occupy roles not unlike those of Galileo or Einstein: the lone individuals committed to truth against a prevailing but profitable orthodoxy.<sup>385</sup> This narrative frame, exotic enough in its depictions of intellectuals to bedazzle, yet simple enough that it possesses the time-honored markers of American individualism (for the American nature of intelligent design does not deserve to be ignored), continues to dominate the discourse of intelligent design proponents.

In addition to characterizing the nature of the debate, design theorists plead the ambiguity of the designer. This subtle argumentative move represents a significant turn away from the explicitly religious creation science that was at issue in *McLean* and toward the naturalistic language more recently in vogue among mainstream scientists. Consequently, this turn allows ID advocates to sidestep criticisms concerning the inherent religiosity of their ideas. The “intelligent designer,” some claim, need not be a god, gods, or God. Indeed, the very ambiguity of the phrase “intelligent design,” comprised of words so abstract as to necessarily entail a certain amount of ambiguity, seems *designed* to function this way. That the consequently implied designer need not be a divine being even further emboldens design theorists into believing they hold a scientific rather than a religious proposition.

Putting this idea to the test, however, Condit illustrates how this idea functions as a kind of verbal bait-and-switch. In order to advance their larger social and political agenda, ID activists need the designer be not only *a* God but *the* specific God of Christianity. Trying to take seriously ID proponents’ contention that space aliens, rather than God, may as well be the designer, she

---

<sup>385</sup> See David DeWolf, John West, Casey Luskin, and Jonathan Witt, *Traipsing into Evolution: Intelligent Design and the Kitzmiller v. Dover Decision*, Seattle: Discovery Institute Press, 2006, 10.

shows that specific ID arguments, such as the argument from irreducible complexity, do not work under this assumption — but they do work when the designer is assumed to be God. Space aliens, for instance, could fit the definition of an intelligent designer yet would not need to create “irreducibly complex” systems given sufficiently advanced technology.<sup>386</sup> Condit assumes this position for the sake of argument, of course, in order to illustrate the disparity between the ambiguous way in which ID proponents deploy the phrase “intelligent designer.” At the same time, she shows how ID proponents’ own arguments cast doubt on the sincerity of their avowed motives.<sup>387</sup>

Observing the ID proponents’ rhetorical bait-and-switch at the phrasal level prepares one to appreciate how they work toward similar aims at broader discursive levels. Design theorists also characterize ID as the subject of active, ongoing scientific debate. Both The Discovery Institute and its sponsored scholars adapted this phrase in 1999 and, despite the absence of any peer-reviewed work either before *Kitzmilller* or after it, the phrase “Teach the Controversy” continues to feature prominently in ID advocacy materials. Indeed, despite the failure of design theorists to attract support from mainstream scientists, this strategy, despite its overall failure, has proven the most successful of the strategies employed to advocate for ID. In 2001, for example, former United States Senator and Presidential candidate Rick Santorum introduced an amendment to the No Child Left Behind Act, itself the subject of much controversy, designed to promote the teaching of ID in American public schools.

This strategy in particular has attracted the attention of rhetorical critics and philosophers alike. Such critics, all of whom reject ID, discuss how presenting ID as the subject of active controversy in the scientific community creates confusion about what counts as science and what

---

<sup>386</sup> Celeste Condit, “The Rhetoric of Intelligent Design,” *Rhetoric and Public Affairs* 1, no. 4, 1998, 598-599.

<sup>387</sup> *Ibid.*, 600.

does not, confusion that disserves the public even as it makes design theory appear more legitimate than it can reasonably claim to be. Cecarelli, for example, counts intelligent design theory as one of many “manufactured scientific controversies,” one wherein a rhetor publicly maintains that the scientific community continues to debate a question when, in fact, scientists have reached consensus on it. She points to the “wedge strategy” just discussed as one particular way in which design theorists maintain the existence of a pseudocontroversy. By “exploiting a popular conception that science only advances when heroic dissidents push at the frontiers of normal science, design theorists purposely replace professional notions of scientific progress with popular notions of scientific progress. They do this, of course, in order to position their advocates as underdogs nobly battling the unscientific and politically motivated orthodoxy imposed upon society by institutions which ought to be protecting and encouraging fair and open inquiry. In adopting this position, they subtly shift the topic of discussion away from technical, scientific concerns and toward a more general discussion about intellectual values.<sup>388</sup>

Despite causing little more than consternation among scientists and rhetoricians, intelligent design in general and the *Kitzmiller* case in particular forced philosophers to reckon, just as they did in *McLean*, with the problem of demarcation. This problem, first explained by Popper, concerns how one can distinguish between a scientific and a non-scientific proposition, connecting the problem of demarcation to general issues in epistemology. For instance, Hildebrand discusses the debate between design theorists and mainstream science as one in which two mutually exclusive epistemologies publicly collide. When such mutually exclusive worldviews clash, they create a situation in which, owing to their incommensurability, coexistence seems impossible at worst and impractical at best. This collision creates an epistemic

---

<sup>388</sup> Ceccarelli, “Manufactured Scientific Controversy: Science, Rhetoric, and Public Debate,” 214-215.

question concerning whether it is possible to articulate an epistemology simultaneously “inclusive of a wide range of people and approaches” but which is also “capable of exclusion of certain people and approaches.”<sup>389</sup> In other words, how does one ensure open and free debate while managing a baseline for admission to the discussion? Yet the problem does not stop here, as Hildebrand argues that intelligent design presents an instance wherein the epistemic problem has become so bound to its advocates’ personal identity that it exists in a state of mutual exclusion with the current scientific paradigm.<sup>390</sup> Of course, simply refusing to admit an idea into the context of a specialized debate does not stop it from finding more receptive audiences among non-specialists.

Others have pointed to the marked contrast between the prevaricating, postmodern argumentative style of ID proponents and the essentialist positive philosophy they advance, particularly when they discuss issues of epistemology, culture, and morality. Analyzing this strategy, Robert Pennock, who would himself later testify in *Kitzmiller v. Dover*, characterizes it as a rhetorical bait and switch that, significantly, distinguishes ID proponents from their predecessors in the anti-evolution and creation science movements. As he puts it, “the strategy of the YECs [young earth creationists] has been to attack evolution head-on by confronting it with their Genesis-based alternative. The IDCs [intelligent design creationists], on the other hand, are relativists about natural human knowledge.”<sup>391</sup> At the same, though, ID proponents constantly decry the moral implications of the “materialist worldview” and seek, through means both open and stealth, to substitute this worldview’s ethic with strong prohibitions on premarital sex, public promotion of the nuclear family, and discouragement of homosexuality, non-traditional gender

---

<sup>389</sup> Ibid, 219.

<sup>390</sup> Ibid, 231.

<sup>391</sup> Robert Pennock, *Tower of Babel: The Evidence Against the New Creationism*, Cambridge, Massachusetts: The Rhetoric of Intelligent Design (2000): 210.

roles, and secular forms of entertainment.<sup>392</sup> The designer, while it may not have been God, was definitely a Reagan Republican.

### **Synopsis of the Trial**

How intelligent design migrated from a small think tank in Seattle to a Federal district court in Pennsylvania owes itself to the persuasiveness of this complex of ideas as well as the desire of some citizens in Dover to purge their public school of evolutionary teachings. At some time between 2003 and 2004, Seth Cooper, an attorney with the Discovery Institute, contacted Bill Buckingham, a devoutly religious member of the Dover Area School Board. The two discussed gaps in Darwinian evolution in addition to the legality of teaching intelligent design. Some time after this conversation, members of The Discovery Institute made a presentation to the Dover School Board, offering them various materials designed to articulate the principles of intelligent design.<sup>393</sup>

In 2004, ID landed in Dover, quickly impressing many religious members of the town's school board. By January 2005, the school board had, in conference with design theorists sponsored by the Discovery Institute, sought to introduce ID into the school district's biology curriculum. At school board meetings held in June 2004, Buckingham and other members of the Dover School Board spoke disparagingly of Darwinian evolution and openly speculated about how they could integrate intelligent design into their district's classrooms. Later that summer, the school board approved the use of public funds to purchase copies of the textbook *Of Pandas and People*, a textbook widely promoted by The Discovery Institute. Litigation in the case finally began after the Dover School Board voted on October 18, 2004, to introduce the Freshman

---

<sup>392</sup> Ibid, 317-321. Pennock discusses the numerous examples in Johnson and other ID proponents' writings in which they explicitly link these goals, to be pursued at both the personal and the policy levels, to the advancement of design theory in American public life.

<sup>393</sup> Forrest and Gross, 325, offers an overview of the machinations that led specifically to this case.

Biology section on Darwinian evolution at its high school with a statement regarding the concept of intelligent design. This move, as now seems only too obvious to anticipate, only reignited the controversy thought to have been laid to rest nearly two decades earlier. The statement, which the school board required that teachers read before introducing the unit on evolution, read:

The Pennsylvania Academic Standards require students to learn about Darwin's Theory of Evolution and eventually to take a standardized test of which evolution is a part. Because Darwin's Theory is a theory, it continues to be tested as new evidence is discovered. The Theory is not a fact. Gaps in the Theory exist for which there is no evidence. A theory is defined as a well-tested explanation that unifies a broad range of observations.

Intelligent Design is an explanation of the origin of life that differs from Darwin's view. The reference book, *Of Pandas and People*, is available for students who might be interested in gaining an understanding of what Intelligent Design actually involves. With respect to any theory, students are encouraged to keep an open mind. The school leaves the discussion of the Origins of Life to individual students and their families. As a Standards-driven district, class instruction focuses upon preparing students to achieve proficiency on Standards-based assessments.<sup>394</sup>

By December 14, 2004, Tammy Kitzmiller and ten other parents of students within the school district had filed a complaint alleging contesting this rule on grounds that it violated the Establishment Clause of the Constitution. Discovery and other pre-trial litigation proceeded quickly, and on September 26, 2005, a bench trial commenced, lasting until November 4 of the

---

<sup>394</sup> *Kitzmiller v. Dover*, 1-2.

same year. Once again, Americans fixed their eyes on a rural town while, from September to December 2005, lawyers argued in a US District court about how to distinguish a scientific idea from a non-scientific idea.

### **Preparing the Corpus**

Unlike the transcripts for the Scopes Trial or *McLean v. Arkansas*, those for *Kitzmiller v. Dover* were readily available in PDF format, giving me complete access to Miller and Behe's direct testimonies. Nevertheless, I still spent a considerable amount of time separating each witness's testimony into a plaintext file, removing formatting — such as line numbers — originally added by the court reporter, and correcting, when they were obvious, typos and other ambiguities. Fortunately, this tedium required me to spend a lot of time reading and re-reading the relevant data before I coded them, increasing, at least, my subjective confidence in my interpretation.

After this process, I loaded each witness's testimony into AntConc's file view, using the same list of modal verb morphology that I used to analyze Metcalf, Bryan, Ruse, and Geisler's testimonies. After further extracting only modalized statements, I then coded each statement for the sense in which the relevant modal verbs were being used. In the sections below, I present the results of this process, showing how Miller deploys modal verbs to construct his sense of expertise and how Behe deploys modals to construe intelligent design as a legitimate field of inquiry. In particular, I focus on how Behe's testimony develops the "para-expert" epistemic and rhetorical stance.

## Results

Miller and Behe's testimonies differ perhaps more than those of any of the other witnesses considered here. While Miller's use of modal verbs, with "would" again as the most frequent, construes the expert stance many familiar ways, Behe's testimony highlights the unique role of modal verbs in constructing the "para-expert" stance. This stance relies primarily on the concept of possibility. All questions, even questions thought to be fundamentally settled, remain open for debate. Due to the length of Miller and Behe's testimony, which were both more than twice as long as the testimonies of other witnesses, an analysis of the most frequently used verbs has not yet been conducted, however. The frequency data, however, revealed a relationship relevant to both the debate over ID and the development of the para-expert stance more generally. The charts prefacing my analysis of Miller and Behe's testimony revealed that Behe's testimony displays, overall, nearly one and a half times as many modalized statements in general — 672 compared to 475 — and more than a third more epistemically modalized statements — 544 compared to 338 — in particular. When coded for epistemic stance expressed in statements, the rhetorical balance of Miller's testimony, with 168 statements modalized for possibility and 170 modalized for necessity, contrasts sharply with the strong preference for statements modalized for possibility in Behe's testimony.

Indeed, with 395 statements modalized for possibility and 167 statements modalized for necessity, Behe's testimony also demonstrates a more than two to one preference for possibility over necessity. Like Metcalf, Ruse, and even Geisler, whose counter-expert stance simulated linguistic and rhetorical features of the expert stance, Miller's testimony evinces confidence without being over-certain. As a rhetorical feature of his testimony, possibility is to Behe what certainty was to William Jennings Bryan — both the key means of attacking evolution and the

key means of defending intelligent design. Although Behe, as part of the ID movement, is frequently construed as an intellectual heir of Bryan to at least some degree, he seems to be, from a linguistic and rhetorical perspective a kind of anti-Bryan. Where so much was certain to Bryan that evolution was obviously false, so much is uncertain to Behe that ID is obviously possible. In the following analysis of Miller and Behe's testimony, then, I seek to develop these ideas by showing how Miller and Behe linguistically and rhetorically construct their expert and para-expert stances.

### **Overview of Kenneth Miller's Testimony**

Kenneth Miller, an evolutionary biologist at Brown University, offered direct testimony over a day and a half, starting on the morning of day one and concluding during the morning of day two. His testimony introduced a number of topics, including demarcation criteria for science, the nature of the peer review process, and, more particularly, whether intelligent design constituted creationism or science and whether the textbook *Of Pandas and People* seemed to promote ID as a form of creationism. Significantly, he also discussed, as Michael Ruse had in *McLean*, the scientific consensus in favor of evolution and, also importantly, the absence of conflict between science and religion. Like Michael Behe, Miller even professed for the court to be a practicing Catholic, and he spoke in personal terms about the way his faith interacted with his scientific profession. The table below provides an overview of modal verb usage in Miller's testimony. The length of his and Behe's testimonies makes a comprehensive qualitative discussion of every argumentative move they make somewhat impractical here, but the data definitely have more to offer. In what follows, then, I discuss some of the most important rhetorical features of Kenneth Miller's modalized statements.

### Epistemic Modal Verb Usage in Kenneth Miller's Testimony

<b>Word Token Frequency Rank</b>	<b>Modal Verb</b>	<b>Number of Word Tokens</b>	<b>Epistemic Uses</b>
1	can	156	124
2	would	90	60
3	will	83	65
4	could	44	16
5	might	41	25
6	must	18	15
7	should	36	10
8	may	7	3
<b>Totals</b>	–	475	328

**Can**

In statements modalized with “can,” Miller performs a number of rhetorical moves that we’ve seen before, such as defining the nature of science and explaining the fact-theory distinction (by now a distinction attempted in all three cases considered here), but he also introduces a few unique to this case, such as describing the peer-review process, explaining why ID isn’t science, and, more specifically, asserting that the textbook *Of Pandas and People* pushes fundamentally religious ideas masqueraded as science. Miller’s use of epistemic “can” also reveals the rhetorical role that negation can play in an act of definition, for, when using epistemic “can” to discuss ID, Miller frequently negates this modal to discuss the ways in which ID not only fails to fall within the boundaries of science but also lacks, by definition, the possibility of ever being a recognizable set of scientific propositions.

By taking pains, for instance, to emphasize the communal nature of science, Miller is able to respond to ID advocates’ positioning of themselves as encountering the predictable establishment pushback that was also experienced by figures like Galileo. This analogy, used frequently by ID advocates, remains to this day one of the primary ways in which they publicly present themselves. Pointing, for instance, to the rejection of ID by organizations like the American Association for the Advancement of Science, which, Miller observes, “if any single organization can fairly be said to speak for the scientific community of the United States, it is that association,”<sup>395</sup> Miller not only defines science as communal but also positions ID outside of its mainstream.

This positioning sets up how Miller will then defend evolution and, more importantly, speak directly to the nature of ID. Early on in his testimony, he notes “that intelligent design is not science, and therefore it cannot be construed as a scientific theory in any sense whatsoever.”

---

<sup>395</sup> Kenneth Miller, “Testimony in *Kitzmiller v. Dover*, Day One Afternoon Session,” 41.

The modalization in this statement is interesting for its presence as for the negation of “can,” which Miller uses to place ID *totally* outside the boundaries of science. Using another negation of epistemic can, Miller observes that nothing within the normal parameters of science allows him to conduct an experiment to detect the designer, the central of feature of ID. As he puts it, “if you invoke a non-natural cause, a spirit force or something like that in your research and I decide to test it, I have no way to test it. I can't order that from a biological supply house, can't grow it in my laboratory.”<sup>396</sup>

Indeed, Miller finds this problem inherent to the very definition of ID. When asked to define ID, he uses a double-modalized sentence that again deploys negation to set ID outside the parameters of normal science. For instance, Miller summarizes ID as “the proposition that some features of living things are too complex to have been produced by the process of evolution and therefore they must be attributed to the creative work of a special intelligence or designer who creates these pathways.” He goes on to note that this designer “operates in ways that stand outside of nature and therefore by mechanisms which cannot be scientifically investigated.” What is also important here is what Miller does not say about ID. Nowhere does he explicitly say that ID is *false*. In keeping with the narrow construal of questions and epistemic balance characteristic of the expert stance, Miller simply focuses on establishing that, whatever its truth value, ID not only isn't but could *never be* science.

## **Would**

In statements modalized with epistemic “would,” Miller speaks more frequently about the role of evolution in biology research and in the biology curriculum. Although Miller's complete

---

<sup>396</sup> Ibid, Day One Morning Session, 63.

set of modalized statements reveals a slight bias in favor of possibility statements, his statements about evolution are, not insignificantly, modalized to show certainty. Miller also speaks more about the nature of ID. As we saw when looking at how he used epistemic “can,” Miller spent no small amount of time discussing what ID is not. In statements modalized with epistemic “would,” he speaks to what ID is — namely, a form of special creationism. Indeed, he explicitly links ID to the design arguments of William Paley that were reviewed earlier in this chapter. Miller also speaks directly to the argument from irreducible complexity, showing how its central appeal to the parts of the bacterial flagella follow from an incorrect series of inferences.

Miller makes unequivocal statements about the role of evolution, which he claims “most biologists would describe evolution as a process of change over time that characterizes the natural history of life on this planet,” in the biology curriculum. He goes so far as to observe that “no course in biology would be complete without it.”

Similarly, Miller evinces just as much certainty that ID is a form of creationism as he showed in judging it not to be science. “Anyone would recognize that in a flash as a form of special creation, because what we have here is intelligent design means the various forms began abruptly.” Specifically, he observes that ID theorists’ ideas “in western culture, very often one would go back to a book called *Natural Theology* that was written by the Reverend William Paley and published, I believe, in 1802.

Having linked ID to Paley and through Paley to religion, Miller attacks the idea of irreducible complexity, central to Michael Behe’s research, directly. Recounting his childhood experience with the chicken pox virus to illustrate the immune system’s ability to move genetic information, Miller then provides the evolutionary explanation for this ability, which Behe claims is impossible. Going on to note that ID has yet to provide a positive explanation for the

same phenomenon, Miller concludes, “It also means that the prediction that Dr. Behe quite confidently made on the basis of intelligent design theory, that this system would not be amenable to Darwinian investigation, that there would be no evolutionary explanation for it, turned out to be wrong.” In this way, Miller puts Behe himself outside the boundaries of mainstream science, the same terminological space that he has put ID more generally into.

### **Will**

Miller’s uses of epistemic “will” offers a summative view of his testimony as a whole, as he uses this modal to describe the peer review process, characterize the arguments of ID proponents, and describe the consequences of ID’s assumptions for productive scientific research. In several statements, he also comments on the textbook *Of Panda and People*. Since I discuss most of these moves elsewhere in this section, I want to focus here on how Miller uses a combination of epistemic “would” and “will” to imagine ID’s consequences for scientific research.

Acknowledging that many aspects of evolutionary theory remain unexplained, Miller nevertheless rejects the inferential leap made by ID proponents — namely, that if evolution doesn’t seem to explain something, one must infer design. Were this attitude widely adopted, *all* research progress would effectively stop. Comparing unexplained aspects of evolutionary theory to current controversies in biochemistry, Miller notes that no one is going to use the absence of an evolutionary explanation to infer that amino acid bonds were somehow just created by a designer. As he elaborates, “That’s something we never say in science, because if we did, it would be a research stopper. It would tell us, give up, go home, we’ll never figure it out.” This analogy essentially functions as a *reductio ad absurdum* argument. By showing how assuming

the fundamental premises of ID would derail the very scientific process in which it supposedly participates, Miller makes ID seem something akin to a performative refutation.

### **Could**

Turning to how Miller uses epistemic “could,” we see how he characterizes the ambiguous identity of the designer as a feature that distinguishes ID from creation science. Summarizing Behe’s work on the topic, Miller observes, “And I believe he suggests that the designer, of course, could be a divine force, but it could be super intelligent space aliens from Mars. Going a step further, he adds, “or perhaps time traveling cell biologists going into the past from the future and causing the structures to be put together.” This, Miller observes, actually makes ID even *less* scientific than creation science which, however wrong, he notes, at least had testable hypotheses about topics like the age of the earth. His coy suggestion about “time traveling cell biologists” suggests, though, that he does not take Behe’s claims at face-value, that the ambiguity of the designer maintained by ID theorists is a verbal smokescreen maintained to get around the essentially religious nature of ID.

### **Might**

Using statements modalized with epistemic “might,” Miller describes the procedures of science and explicates the textbook *Of Pandas and People*. Additionally, he once again characterizes the either-or reasoning of ID theorists and shows how deploying it places them outside the parameters of normal science. Since I have already discussed how Miller does both of these things, the discussion here will be brief.

In one statement, Miller emphasizes the public, communal nature of science, implicitly contrasting it with the largely individual efforts of ID’s most prominent advocates. This effectively shows that the methods used by ID advocates to both generate and disseminate their

claims deviates from what scientists normally do. As Miller describes the scientific process, “if you think you either have the data that refutes an important hypothesis or data that tends to support and confirm an important hypothesis, if you think this will be of interest to other people in the scientific community, you then gather up your methods, your procedures...” and make them public. Although “your data might be photographs, might be diagrams, results, tables, gels that we run in the laboratory, something along those lines, and you put them into a scientific publication.” ID advocates, Miller goes on, have not done this. Even the centerpiece of their scientific argument, Behe’s book *Darwin’s Black Box*, was published by a non-academic press and not subject to the ordinary peer review process.

Explicating the textbook *Of Pandas and People*, which he presents as representative of ID as a whole, Miller shows just how far outside the normal scientific process ID goes. Indeed, Miller calls the book’s description of the “sudden appearance” of living organisms with their “basic features” intact, “a profound rejection of this [the parameters of science], because basically what it describes is the special creation of all organisms, because it says basic types of organisms, which in earlier parlance might have been referred to as created kinds, were given a set of instructions.”

Finally, Miller discusses the either-or reasoning deployed by ID activists, specifically connecting it to the time-tested fact-theory distinction first made by William Jennings Bryan. It’s the sort of logical fallacy in which you might say, well, I have theory A, and I have theory B. But by saying, the theory is not a fact, it essentially invites students to say, you know what, other theories might be factual, this one isn’t.

## Should

In almost all of the statements modalized with epistemic “should,” Miller attacks the work of Michael Behe, focusing specifically on the argument from irreducible complexity and Behe’s favorite example, the bacterial flagellum. As noted above, Behe considers the flagellum a system so complex that, were any one part to be taken away, the whole system would cease to function. In his discussion of the flagellum, Miller puts it simply, saying, “When we take this complex multi-part system, which is the bacterial flagellum, the prediction made by Dr. Behe from irreducible complexity is when we break the parts apart, we should have no useful functions.” Putting it another way, Miller specifically invokes the machine metaphor so prominent in ID discourse, paraphrasing Behe’s claim in noting “since this was an irreducibly complex machine, and we’ve taken away most of its parts, what’s left behind should be non-functional because, you remember, he wrote, any pre-cursor to an irreducibly complex machine that is missing a part is, by definition, non-functional.” But taking away the parts of the flagellum does not render the system non-functional. Rather, a new system, called the type III secretory system, emerges. By showing, then, the inconsonance between the certainty with which Behe’s (paraphrased) predictions are made and the actual results of empirical investigations, Miller again moves ID, through Behe, further outside the boundaries of mainstream science.

## Must

Like Michael Ruse in *McLean*, Miller uses epistemic “must” to explain demarcation criteria. More importantly, he characterizes the evidence for ID in terms that show how it fails to meet the demarcation criteria of science. Along with the particular failures of irreducible complexity, Miller faults ID for its either-or reasoning, which depends on attacking evolution and counting any evidence against evolution as evidence *for* ID. Echoing without citing

something like the five “essential” criteria of science that featured in *McLean*, Miller observes that “scientific inquiry must be open...it must be subject to duplication, replication, test and examination by other scientists.” In contrast to this, the evidence for ID “always negative, and it basically says, if evolution is incorrect, the answer must be design.” But this “untestable assertion” that “living things on this planet are too complex to have been explained by evolution and, therefore, they must be the work of a supernatural designer creator” is, ultimately, “not subject to detection, analysis, or identification.”

### **May**

Although three instances of epistemic “may” occur in Miller’s testimony, in two is quoting from *Of Pandas and People*. In the one remaining occurrence, Miller refers to research being done at the time Behe’s book *Darwin’s Black Box* was being published. This research concerns the evolution of the genes that comprise the immune system, and has implications for ID because it suggests what Behe claims is impossible. As Miller describes it, “It’s possible that the ancestors of these genes, they’re called RAG genes, may have been horizontally transferred into a metazoan multi-cellular animal lineage at a recent point in evolution.” A technical exposition being impossible here, the point is that this research was being conducted as Behe was writing *Darwin’s Black Box* and, more importantly, Behe should have been aware of it. So, Miller is left to conclude that Behe either intentionally ignored it because it did not suit his thesis or that he was unaware of it. In either case, Miller concludes, this shows how ID theorists, even the most prominent of them, often fail to practice good science.

Overall, Miller’s testimony does not differ too much from that of Maynard Metcalf, Michael Ruse, or even Norman Geisler. The expert and the counter-expert stance have in common slight preferences for possibility over necessity despite being deployed toward competing ends.

### **Overview of Michael Behe’s Testimony**

Of all the witnesses to testify in *Kitzmiller v. Dover*, Michael Behe was the most prominent spokesperson of ID. He was also, in Judge Jones’s decision explaining why Behe’s side lost the case, the witness most cited, sometimes for particular scorn. Behe also offered, of all the witnesses considered in this project, the single longest portion of testimony. His direct testimony, which began on October 17, 2005 and lasted until the afternoon of the next day, and in it he attacked on evolution, explained arguments such as irreducible complexity, and, of particular interest, construed the scientific community as almost conspiratorial in its efforts to silence ID. Throughout it all, Behe deploys what I call the “para-expert” stance. Like the anti-expert and the counter-expert, the para-expert positions themselves against socially established expertise. Unlike the anti-expert or the counter-expert, who at least accept most of the basic frame of the issue imposed on it by established expertise, the para-expert seeks to challenge expertise by arguing for some more fundamental shift in the ground rules of the debate. A comparison will illustrate what I mean here. In *McLean v. Arkansas*, creation scientists sought to introduce creation science as an alternative to evolution, but they did so more-or-less within the basic parameters of established science — geologists, for instance, can at least test for remains of the Genesis Flood. The specificity of the counter-expert, however, is matched by the vagueness of the para-expert. Adopting the para-expert stance, as Behe did, one makes claims at a high

level of generality and with care — as the chart outlining Behe’s modal verb usage below reveals — to emphasize epistemic possibility. Indeed, possibility, rather than the balance of the expert and counter-expert or the certainty of the anti-expert, is the defining quality of the para-expert stance.

### Modal Verb Usage in Michael Behe’s Testimony

<b>Word Token Frequency Rank</b>	<b>Modal Verb</b>	<b>Number of Word Tokens</b>	<b>Epistemic Uses</b>
1	can	205	188
2	would	127	92
3	could	108	90
4	might	95	93
5	will	55	32
6	should	39	10
7	may	27	24

8	must	17	15
<b>Totals</b>	–	672	544

## Can

In statements modalized with epistemic “can,” by far Behe’s most frequently deployed modal, Behe develops a number of the key components of the para-expert stance. He attempts to articulate, for instance, alternatives to the peer review process about which Miller testified. Furthermore, he tries to deploy the now very famous fact-theory distinction to defend the Dover School Board’s statement about evolution. Through such arguments, Behe positions himself not so much against the expertise of mainstream scientists like Miller. He is, rather, developing a parallel expertise, one which deploys the same basic terminology as scientific expertise but which deploys those terms as if the underlying assumptions are different. This is distinct from the counter-expert who, while claiming to accept the mainstream terminology, claims to be the “real” voice of it. As Behe’s deployment of epistemic “can,” not to mention the other modals will show, ambiguity and equivocation about key disciplinary terms, manifested at the sentence-level by statements modalized to emphasize what is possible instead of actual, fundamentally distinguishes the para-expert stance from the other three developed in this dissertation.

In one statement, for instance, Behe defends the peer review mechanism to which he has subjected his work, a direct response to Miller’s suggestion that books like *Darwin’s Black Box* had not been peer reviewed and thus did not “count” as research toward the ID agenda. Behe retorts that, although it hadn’t been subjected to peer review by an academic press, the numerous conferences, lectures, and seminars at which he had presented his work more than met the

standard of peer-review. As he puts it, “the seminars and discussions that I’ve just gone through are, in my opinion, much better forums for presenting such material, because generally you can speak continuously for 50 minutes to an hour.” Indeed, he’ll note later that, if those experiences are added to the numerous times he has had to defend his ideas in print or in public debate, then ID can actually be construed as having undergone an even more rigorous peer review process than that to which normal science is subjected.

Deploying an appeal that has remained durable even into the present, Behe also shored up the fact-theory distinction that has featured now in every trial discussed here. Objecting to the definition of the word “theory” offered by the National Academy of Sciences,<sup>397</sup> Behe suggests, “Well, that’s certainly one definition of the word theory, but you have to be sensitive to the fact that the word theory can be used in other senses as well.” He then goes on to offer examples of the word “theory” used in scientific publications that seem more in line with the way it was used in the Dover School Board’s statement about evolution.

## **Would**

Of Behe’s statements modalized with epistemic “would,” two stand out. In one, Behe analogizes the bacterial flagellum with a motor, showing again ID theorists’ preference for machine metaphors. In a second statement, Behe uses a literary analogy to argue that ID offers explanations for things evolution leaves unexplained. Taken together, these statements focus his epistemic stance on the certainty of ID and, for Behe at least, the practical impossibility of finding evidence to verify evolution.

---

<sup>397</sup> This was read in court and, at the time, read: “a well substantiated explanation of some aspect of the natural world that can incorporate facts, laws, inferences, and tested hypotheses.”

Repeating the basic analogy to a machine, Behe compares the bacterial flagellum, perhaps his favorite example, to a motor in order to demonstrate the necessity of inferring design. As he notes, “If in an outboard motor you took the propeller and you put it on top instead of down by the rotor, then the machine would not function.” This absence of function, following the standard logic of design theorists since Paley, suggests that the machine is not a natural object. Since the bacterial flagellum is a part analogous to such a propeller, the same conclusion applies. Thus, Behe conveys his certainty that ID offers not only a plausible explanation of biological phenomena but also *the best* explanation of such phenomena.

In the last statement examined here, Behe explains an analogy he made in *Darwin's Black Box* to Sisyphus, the mythological king doomed to forever roll a boulder up a hill without reaching the top. More specifically, he had remarked that, when we attempt to find Darwinian explanations for things, “Sisyphus himself would pity us.” This, as Behe puts it, “was just a literary flourish there....This was meant to indicate frustration. And I argued that Darwinian attempts at explanations would be similarly frustrating.” This analogy, in other words, functions as another way of stealthily arguing that it is evolution, not ID, that fails to meet the criteria of science. As has been indicated in other parts of this section, arguing that the parallel rhetorical and argumentative frame actually *improves* upon its competitor has emerged as one of the hallmarks of the para-expert stance.

### **Could**

Behe's statements modalized with epistemic “could” offer some of the most interesting parts of his testimony because in this set of statements we see him turning common criticisms of

ID against evolution. More specifically, he asserts that, while ID, contrary to Miller, is completely falsifiable, it is *evolution* that can't be falsified. Indeed, Behe even suggests that evolution is so resistant to falsification that it can be construed to survive virtually every empirical test. This is basically the same argument that Miller made about ID. So, another feature of the para-expert stance is what students of logical fallacies would call the *tu quoque* fallacy.

In one statement, Behe accuses evolutionary theory in general of being unfalsifiable. Embedding this accusation in a rhetorical question and invoking ID theorists' familiar machine metaphors, Behe ponders aloud, "What experimental evidence could possibly be found that would falsify the contention that complex molecular machines evolved by a Darwinian mechanism?" And again he observes, "there is no experimental evidence to show that natural selection could have produced the immune system." Taken together, these statements attempt to shift the burden of proof back onto evolutionary biologists.

### **Might**

Using epistemic "might," Behe makes many of the rhetorical moves already observed in this section. In one, however, he deploys a familiar move to a less familiar end, appealing to the fact-theory distinction to contend for the educational value of the Dover School Board's statement about evolution. In this statement, Behe asserts that, whether one acknowledges the problems with evolution or is just interested in open debate, "a reasonable person might wonder if the theory is missing some large piece of the puzzle, and certainly I think as an educator students should be apprised of facts like these." This statement effectively makes including ID in the conversation a requirement of maintaining the open inquiry which scientists

like Kenneth Miller claim to prize. In that way, Behe pushes the burden both for establishing good scientific inquiry and for educating students properly back onto supporters of evolution.

### **Will**

One statement especially stands out among Behe's uses of epistemic "will." In it, he asserts again the total unfalsifiability of evolution, turning the charge of mainstream scientists about ID against them. He argues, "It [evolution] doesn't predict anything. It will live with whatever result experimental science comes up with, which means that Darwin's theory has nothing significant to say about a major feature of life, embryology." This is just one of the many ways in which Behe attempts to attack evolution, which he spends much of his testimony doing, either by linking it to a supposedly failed prediction or by claiming it has nothing to say about some fundamental aspect of biology.

### **Should**

In statements using epistemic "should," Behe attempts to cast doubt on evolution by linking it to patently false predictions that, by his reckoning, evolution necessarily makes if it is taken at face value. This is another part of Behe's testimony-long strategy of casting doubt on evolution by suggesting that it can't be falsified. Since he cites a striking example, the statement is worth quoting in full:

"Not long after Darwin published his theory, it was realized by a man named August Weisman that Darwinian theory actually predicts that most organisms should reproduce asexually because, one reason is because Darwinian theory, one goal of an organism, goal in the terms of a better evolutionary result, is to get more of the organism's genes into the next generation."

This example stands out for at least three reasons. First, Behe is attributing this criticism of Darwin to someone else, so he has some distance from the claim in the event that it gets refuted. This helps him to maintain the appearance of objectivity that the para-expert, by a combination of ambiguation and performative neutrality, seeks to achieve. At the same time, the

example requires no technical knowledge to understand. It is obvious that most organisms — at least those readily perceptible to the human senses — do not reproduce asexually. So, by attempting to show that evolution is wrong in such a clear, non-specialized way, Behe would by implication strengthen the suggestion that the scientific community’s attachment to evolution stems from such extra-scientific motive. Carefully, though, he does not explicitly decry scientific materialism, as Norman Geisler did in *McLean* and as the Discovery Institute’s materials did at that time.

### **May**

Behe’s statements modalized with “may” introduce a new rhetorical feature of the para-expert stance: accusing established experts of taking advantage of non-experts’ dependence on them. Referring to data cited by Kevin Padian, one of the plaintiffs’ experts, Behe remarks that “while such data is interesting, and...to a non-expert in the field might look like it may explain something, if it's asserted to explain something, nonetheless, such data is irrelevant to the question of whether the Darwinian mechanism of random mutation and natural selection can explain complex systems.” In other words, Behe is casting doubt on the motives of evolutionary scientists by indirectly accusing them of presenting information that only looks compelling to the ignorant. Since this is an accusation that was also made about creation scientists and ID theorists, we see here another example of Behe turning whatever accusation is made against him back toward his opponents.

### **Must**

With just a few statements modalized with epistemic “must,” Behe nevertheless

demonstrates a few additional features of the para-expert stance. He defends ID theorist's oft-criticized refusal to name the designer, borrowing the language of research methodology to do so. This refusal, which we noted Kenneth Miller slightly poked fun at, is treated by Behe as evidence of ID's seriousness. To him, not enough research has yet been done on the features of design itself to even begin assigning an identity to the designer. This, he observes is, a virtue because "as a matter of procedure, the design must first be apprehended before there can be any further question about the designer." So, rather than being an ambiguity strategically maintained to get around the Establishment Clause, this just represents that ID is at a less developed stage in its research program than other research agendas. At the worst, it shows that ID has developed somewhat slowly; at the best — and Behe surely opts for this interpretation — it shows not only that ID researchers are serious scientists, but that they are perhaps *more serious* scientists than the mainstream that Miller represents.

### **The Trial's Conclusion**

When Judge John E. Jones III, a Bush appointee expected by some to offer sympathy to intelligent design, issued his ruling, he categorically rejected the supposition that intelligent design is at all scientific, and the intelligent design movement fell almost as quickly as it had risen. Though The Discovery Institute continues to patronize design theorists, no significant legal challenge has arisen or seems possible with respect to ID. More than a month passed until, on December 20, 2005, Jones issued his decision.

The first four sections of the decision consider the background of the case, the parties involved, the history of cases informing his decision, and the legal tests appropriate to deciding this case. After first, reviewing how the Dover School District's policy moved from being voted

on by the board, second, how it was communicated to the town, and third, how it became the subject of a lawsuit, Jones offers a brief history of Federal establishment clause jurisprudence.<sup>398</sup> In the fourth section of his decision, Jones argues why it is appropriate to apply the Endorsement Test and the Lemon Test to decide this case. The Endorsement test asks the court to consider whether an “objective observer” would think that the policy constituted a government endorsement of religion. Meanwhile, the Lemon Test offers functions as a heuristic by which the court considers whether an act has a secular purpose, whether it advances or inhibits religion, and whether it fosters an “excessive entanglement” between the government and religion. The fifth section, which contains Jones’ consideration of “Whether ID is science,” comprises his application of the Endorsement Test to the Dover School Board’s policy. Jones argues that the Dover School Board’s Policy failed the endorsement test for three reasons, all of which rely utilize the testimony of experts to reason from how a hypothetical objective observer would categorize ID to his legal assessment of the Dover School Board’s policy. First, Jones claims, an objective observer “would know that ID and Teaching about ‘gaps’ and ‘problems’ in Evolutionary Theory are Creationist, Religious Strategies that Evolved from Earlier Forms of Creationism.”<sup>399</sup> Second, “an objective student would view the disclaimer as an endorsement of religion.”<sup>400</sup> Third, that an “objective Dover citizen” would read the School Board’s policy as an endorsement of religion.<sup>401</sup> And finally, because Jones agrees with the plaintiffs’ experts that ID necessitates supernatural causation, it is “not science.”<sup>402</sup> More specifically, he constructs a

---

<sup>398</sup> Jones, 1-6.

<sup>399</sup> Ibid, 18.

<sup>400</sup> Ibid, 38.

<sup>401</sup> Ibid, 50.

<sup>402</sup> Ibid, 64.

historical narrative which links the ID movement as a whole as well as specific persons and organizations, such as Phillip Johnson (the movement's founder) and the Discovery Institute. Furthermore, Jones notes that the specific wording of the statement presented to students, such as noting that Darwinian evolution "is a theory...the theory is not a fact," suggests to students that Darwinian evolution and its proponents are not to be trusted and that they should look to the alternative textbook, *Of Pandas and People*, instead.<sup>403</sup> Adults, too, would recognize not only the dubious nature of the statement but also that the actions of members of school board, some of whom, for instance, made repeated inquiries into the religious beliefs of teachers, constituted a government endorsement of religion.

In the last section of the decision, Jones moves from the Endorsement Test to the Lemon Test and finds that the Dover School Board's policy fails all three aspects of it. That is, he found that the Dover School Board's policy lacked a secular purpose, constituted an advancement of religion, and created an "excessive" relationship between the government and religion.

Regarding the purpose prong of the test, Jones notes that "the disclaimer's plain language, the legislative history, and the historical context in which the ID policy arose, all inevitably lead to the conclusion that Defendants consciously chose to change Dover's biology curriculum to advance religion."<sup>404</sup> The fact that Jones interprets the school board's actions as being a deliberate choice to advance religion is significant because the first major prong of the Lemon Test concerns itself with the purpose an individual or group was trying to achieve through a contested act. Not only did the School Board's actions in the case lack a secular purpose but "since ID is not science, the conclusion is inescapable that the only real effect of the ID Policy is

---

<sup>403</sup> Ibid, 40.

<sup>404</sup> Ibid, 93.

the advancement of religion.”<sup>405</sup> On these grounds, Jones found that the disputed policy failed the Lemon Test just as it had the Endorsement Test. The Dover School Board was found to have violated the Constitution, and intelligent design’s brief moment in the legal spotlight faded.

### **The Discovery Institute Today**

Though intelligent design failed in Dover, it remains a key component of the Discovery Institute’s platform. Still based in Seattle, the Discovery Institute continues to publish works by ID theorists. More recently, though, it has been loosely connected — just as the rhetorical stances and more general tropes of the three cases now discussed have been — in the ongoing, multi-state effort against Critical Race Theory. Indeed, one of the journalists most responsible for the anti-CRT movement, Christopher Rufo, is the former director of the Discovery Institute’s “Center on Wealth and Poverty,” a relationship that has been noted elsewhere.<sup>406</sup> It is no surprise, then, that the clash between the expert, anti-expert, counter-expert, and para-expert stances, along with the rhetorical moves innovated in the anti-evolution, creation science, and intelligent design controversies, should recur in the anti-CRT debate. In the next and final chapter, I provide a final discussion of my results and a final illustration of what they mean for the ongoing state of public discourse in the United States.

---

<sup>405</sup> Ibid, 135.

<sup>406</sup> Jones, “How to Manufacture a Moral Panic.”

## Chapter Six

### Conclusion

The three cases studied in this project have illustrated how expert witnesses have used epistemically modalized statements to develop, alternatively, the expert, anti-expert, counter-expert, and anti-expert stances. In this concluding chapter, I offer a more global view of all six witnesses' testimonies, speaking to broad rhetorical and linguistic trends across all three cases. Then, I develop more explicitly a comparison I have made throughout this dissertation: the analogy between contemporary right-wing rhetoric, such as that of the anti-CRT movement, and the three evolution controversies studied earlier, particularly the Scopes Trial. Then I bring all of my observations together into some final reflections on the rhetorical uses and abuses of the expert, anti-expert, counter-expert, and para-expert stances before concluding with suggestions for future research.

A broad view of modal verb frequency in the Scopes Trial, *McLean v. Arkansas*, and *Kitzmiller v. Dover* reveals just how much more dependent — if the amount of time given to speak is any measurement — Americans have become on experts throughout the 20<sup>th</sup> century. Behe and Miller were the sole witnesses to use epistemic “can” more frequently than any other modal, yet the sheer amount of time they were given to speak, each of them exceeding even the amount of time given to a man like Bryan, who it is no understatement to say was much more generally famous in his time than either Behe or Miller are in their own, is enough to make epistemic can the most frequently used modal overall. It is perhaps worth noting that *Kitzmiller v. Dover* was the only case to be heard under the post-Daubert system of rules, though I will not speculate on the extent to which that might have impacted Behe and Miller's testimony.

**Global Overview of Modal Verb Usage in All Six Witnesses' Testimonies**

<b>Word Token Frequency Rank</b>	<b>Modal Verb</b>	<b>Number of Word Tokens</b>	<b>Epistemic Uses</b>
1	can	419	341
2	would	328	214
3	could	195	129
4	might	190	159
5	will	176	122
6	should	81	60
7	may	49	38
8	must	45	35
<b>Totals</b>	–	1,483	1,098

As has been noted, the expert rhetorical stance is predicated upon the epistemic dependence of the lay person. Paradoxically, of course, every expert functions as a lay person, at

least to some degree, with respect to experts in other fields or sometimes even within their own fields. Viewed as a feature of rhetorical situations, then, any one expert's ability to construe themselves as the voice to be deferred to - deference probably being the most essential goal of claiming expertise - can be seen as much as a function of the exigence and of situational features located predominantly outside any one rhetor. The conflict thesis, the predominant terminological frame within which supposed disputes between science and religion are conducted, offers a good example of such a feature. In each of the three cases analyzed, each witness, with the possible exception of Maynard Metcalf, positioned himself on either one side of or in explicit opposition to the conflict thesis. From William Jennings Bryan and Norman Geisler's reversing of the poles to label evolution an atheistic religion clashing with true science to Michael Ruse and Kenneth Miller's attempts to offer a more accommodationist view, no witness could escape the shadow cast by the conflict thesis.

### **Anti-Expertise, Counter-Expertise, and Para-Expertise in Contemporary Right-Wing Rhetoric**

From the uproar over masks and vaccines to the charge against Critical Race Theory, the anti-expert, counter-expert, and para-expert stances, innovated in these earlier disputes over evolution, now permeate American public discourse. Mask and vaccine opponents routinely vilify scientists, medical professionals, and public health officials; parents stampede school board meetings and demand veto power over curricula designed by professional biologists, historians, and other scholars. Easily recognizable media organizations such as Fox News encourage audiences daily to reject the advice of their government, doctors, and financial institutions while promoting a steady stream of barely regulated diet supplements, gold investments, and pillows designed to help the suspicious citizen fight against — if the seemingly

endless stream of unverified, *unverifiable* claims are taken at face value — what must be the largest, most well-coordinated conspiracy to deprive citizens of the truth that has ever been conducted.

These debates raise broader questions about *which* experts and *which* disciplines are considered “most” expert by institutions and lay persons and, perhaps, therefore least susceptible to anti-expert, counter-expert, and para-expert rhetorical strategies. The legal “success” of the prosecution in convicting Scopes, notwithstanding Ralston’s sentencing error, occurred well-before the widespread popularity of the technological conveniences that now make virtually every American dependent on scientists, engineers, and other specialists generally associated with the natural and applied scientists. By the time of *McLean*, this dependence was well-rooted, and by the time of *Kitzmiller* — taking place as broadband Internet was becoming widely available outside cities — Americans’ dependence on technology had fundamentally reordered their lives. Americans may not understand what makes their Internet boxes work, but they want them to work, so even those in places traditionally thought more conservative might, recognizing not their epistemic dependence but their *practical dependence*, tolerate some deviance in belief, especially so long as they don’t know any scientists in their personal lives. At the same time, recent calls to regulate “Big Tech” — a term usually used to refer to companies such as Facebook, Google, and Twitter — show that even this tolerance can have limits that get expressed in frightful and vociferous ways.

Historians, philosophers, and, sadly, rhetoricians, have not, by contrast, created a similar practical dependence. While access to education generally increased over the 20<sup>th</sup> century, the general prestige of simply *being credentialed* decreased, and not all fields are afforded the same amount of general deference — or any deference — as those which have created practical

dependence. Thus, while not twenty years ago Kenneth Miller could defend evolution from ID by pointing to the numerous medical applications of evolutionary biology, today’s educators, mired in controversy over mask mandates, vaccines, critical race theory, and gender theory (to name the educational controversies of just the last few years) must appeal more broadly to history, ethics, and politics to justify their curricula, fields in which many Americans imagine their opinion to be just as good as that of the professionals. Indeed, the same person who would not argue with his doctor or his mechanic’s judgment might be prepared to show up at a school board meeting to denounce scholarship that they perceive as threatening their values.

The video cited in this dissertation’s first sentence offers a perfect example of both the rhetorical legacy of William Jennings Bryan and the portability of the anti-expert stance. It depicts a diatribe delivered by a parent to a school board in Carmel, New York. Referring to the school board as “liars” and “thieves,” she goes on to assert a list of grievances against her school before articulating a stance on expertise and parents’ rights that might have been lifted directly from one of Bryan’s speeches.<sup>407</sup> She laments, for instance, that “any child who doesn’t believe in Black Lives’ Matter is told they should be canceled” and that “if they believe in God Almighty, they’re part of a cult.” Indeed, her rhetorical question “is this what my tax dollars is paying for?” — lent populist authenticity, no doubt, by the disagreement of its subject and verb — brings to mind Bryan’s remark in his pamphlet “The Menace of Darwinism,” where he wrote that “the parents who pay the salary have a right to decide what shall be taught.”<sup>408</sup> Yet, significantly, this video shows that, in the 2020s, people are also pressing far past the rhetorical boundaries of Bryan. When, for instance, the speaker is asked not to single out individual teachers in the school district, she responds with a charge that she is being persecuted. “Why can’t we let the public speak,” she

---

<sup>407</sup> <https://michaelsavage.com/watch-warrior-mom-fights-back-against-teaching-critical-race-theory/>

<sup>408</sup> William Jennings Bryan, *The Menace of Darwinism*, New York: Fleming H. Revell Company, (1922): 51.

demands, “Why can’t we let the public know that you’re teaching our children to go out and murder police officers? Do you want the proof? I have the proof. Is that what scares you? The proof?” This performance of utter certainty in the absence of evidence or in the face of contrary evidence still characterizes the anti-expert stance today.

A person watching such a video, owing to the extreme nature of the charges made and the vituperative language used to make them, might not notice the obvious: that this speaker is allowed their full turn to speak. As any observer of American political discourse today can observe, the empirical realities of a situation are no constraint on a rhetor’s ability to claim persecution on the part of their political or institutional opponents.

Such anti-expert attitudes among rank-and file-conservatives are supported in the main stream, by counter-experts, both in the form of individual personalities such as former classics professor Victor David Hanson and also in the form institutions like the Heritage Foundation or, reaching more into the public than into the technical spheres, online platforms like Praeger University and news channels like Fox News, where, for instance, former governor and Presidential candidate Muck Huckabee routinely appear to sell books such as “The Kids Guide to Fighting Socialism.” Such individuals and institutions claim as a matter of course that conservatives are being broadly victimized or censored by the media, universities, or even the government and even use the specific language of “viewpoint discrimination” that we observed in Norman Geisler’s *McLean* testimony. What is important to recognize is that, unlike the anti-expert, these individuals and institutions don’t necessarily disavow academic credentials or taking the advice of experts. Like the creation scientists of the 1960s and 70s, they claim instead to be the “real” experts, excluded institutionally by the guardians of an orthodoxy that probably suspect they would lose in an open, fair debate.

The para-experts of the contemporary right, combining the rejection of mainstream expertise with claims to be speaking the real, often hidden truth, have emerged in recent years as a more potent force to be reckoned with than even ID theorists were in the early 2000s, as the rhetorical strategies we observed in Michael Behe's testimony have migrated into non-scientific fields. Lawyers claiming the 2020 election was stolen, for instance, posit an alternative empirical and constitutional reality that, taken at face value, would invalidate virtually every election ever had in the same way that, as Kenneth Miller described it, taking ID seriously would be a total science stopper. In the same way "alt-right" experts like Jordan Peterson, while rejected by the mainstream world of psychology, have created minor monopolies by skipping the peer review process and going straight to YouTube, making millions peddling a vision of gender typically rejected by his academic peers, but persuasive to the non-specialist. Indeed, one wonders how ID would have fared had it been fortunate enough to appear just a few years later.

In the end, these examples demonstrate that, as a set of rhetorical and linguistic moves, the expert, anti-expert, and para-expert stances are portable groups of appeals and ways of positioning one's self toward an audience. While not wholly independent of *actual* expertise, they should be understood as qualities of rhetorical situations as a whole and not simply of individual rhetors or their statements. The rhetor who deploys one stance in one situation could deploy another stance in another.

### **Directions for Future Research**

This project has offered a small, but hopefully significant, addition to the study of English modality and the rhetoric of expertise. Much work, however, remains to be done before a truly adequate understanding of modality or of the rhetorical dimensions of expertise can be achieved. This work has been limited by its rather small scope. Although it was able to offer a

complete analysis of testimony in the Scopes Trial, only two out of many expert witnesses from *McLean v. Arkansas* and *Kitzmiller v. Dover* were analyzed. This was due almost entirely due to the length that a comprehensive analysis would have entailed. Many other witnesses from those cases alone, such as theologian Langdon Gilkey, who testified alongside Michael Ruse for the plaintiffs in *McLean*, or philosopher Barbara Forrest who testified for the plaintiffs in *Dover* and was the only woman to testify as an expert witness in any of the three cases, no doubt have much to offer rhetoricians and linguists alike. Forrest, significantly, was the only expert that the defense team in *Dover* tried to prevent from testifying, as she had earlier authored a book, cited in chapter five, that was highly critical of ID.

Other work might study modality in expert testimony before Congress or other governmental bodies. While the conflicts of the court room have an intuitive appeal, more and more we are seeing that it is the *deliberative* rather than the forensic branches of government that are wielding power, especially in ongoing disputes over education policy. A number of the specific rhetorical appeals, such as the fact/theory distinction, the attempt to claim evolution unfalsifiable, and the performance of certainty in the face or absence of evidence, will almost certainly be detectable in contexts beyond the three evolution controversies studied here as well.

### Bibliography

- 107th Cong. Rec. S6148 (2001) (statement of Sen. Rick Santorum).
- 73<sup>rd</sup> General Assembly, State of Arkansas. "Act 590 of 1981." In *Creationism, Science, and the Law: The Arkansas Case* edited by Marcel C. La Follette, 15-17. Cambridge, MA: The MIT Press, 1983.
- Acharya, Nayha. "Law's Treatment of Science: From Idealization to Understanding." *Dalhousie Law Journal* 36, no. 1, (2013): 1-38.
- A Firing Line Debate: That the Evolutionists Should Acknowledge Creation." *Firing Line*, PBS, December 4, 1997, <https://youtu.be/ITqiIQu-fbA>.
- Aikhenvald, Alexandra. *Evidentiality*. Oxford University Press, 2004.
- Allen, Frederick Lewis. *Only Yesterday: An Informal History of the 1920s*. Harper and Row: New York, 1931.
- Aronson, Jay. *Genetic Witness: Science, Law, and Controversy in the Making of DNA Profiling*. New Brunswick: Rutgers University Press, 2007.
- Austin, J.L. *How To Do Things with Words*. London: Oxford University Press, 1961.
- Barczewska, Shala. *Conceptualizing Evolution Education: A Corpus-Based Analysis of US Press Discourse*. Newcastle upon Tyne, UK: Cambridge Scholars Publishers, 2017.
- Barr, James. *Fundamentalism*. London: SCM Press, 1981.
- Bashor, Phillip. "Creation-Science Rhetoric: A Philosophical Examination." *Philosophy Research Archives* 14 (1988-89): 489-515.
- Behe, Michael. *Darwin's Black Box: The Biochemical Challenge to Evolution*. New York: Free Press, 1996.
- Berkman, Michael and Eric Plutzer. "Scientific Expertise and the Culture War: Public Opinion and the Teaching of Evolution in the American States." *Perspectives on Politics* 7, no. 3 (2009): 485-499.
- Bernabo, Lawrence and Celeste Condit. "Two Stories of The Scopes Trial: Legal and Journalistic Articulations of the Legitimacy of Science and Religion." In *Popular Trials: Rhetoric, Mass Media, and the Law*, edited by Robert Hariman, 55-85. Tuscaloosa: University of Alabama Press, 1990.
- Beyea, Jan and Daniel Berger. "Scientific Misconceptions Among "Daubert" Gatekeepers: The Need for Reform of Expert Review Procedures." *Law and Contemporary Problems* 64, no. 2, (2001): 327-372.

- Bielo, James. “”Particles-to-People. . .Molecules-to- Man”: Creationist Poetics in Public Debates.” *Journal of Linguistic Anthropology* 29, no. 1 (2019): 4-26.
- “Bill Nye Debates Ken Ham.” *YouTube*, Feb. 4, 2014, <https://youtu.be/z6kgvhG3AkI>.
- Bitzer, Lloyd. “The Rhetorical Situation.” *Philosophy and Rhetoric* 1, no. 1, (Jan 1968): 1-14.
- Bizzel, Patricia, and Bruce Herzberg. *The Rhetorical Tradition*. Boston: Bedford/St. Martin’s, 2001.
- Blancke, Stefaan Maarten Boudry, and Massimo Pigliucci. “Why Do Irrational Beliefs Mimic Science? The Cultural Evolution of Pseudoscience.” *Theoria* 83, no. 1 (2017): 78-97.
- Booth, Wayne. “The Rhetorical Stance.” *College Composition and Communication* 13, no. 3 (October: 1963): 139-145.
- Bowler, Peter. *Monkey Trials and Gorilla Sermons: Evolution and Christianity from Darwin to Intelligent Design*. Cambridge: Harvard University Press, 2009.
- Brauer, Matthew J., Barbara Forrest, and Steven G. Gey. “Is It Science Yet?: Intelligent Design Creationism and the Constitution.” *Washington University Law Quarterly* 83, no. 1 (2005): 1-149.
- Brinkley, Alan. *The Unfinished Nation: A Concise History of the American People*. New York: McGraw-Hill Education, 2016.
- Brodsky, Stanley, Michael P Griffin, and Robert J. Cramer. “The Witness Credibility Scale: An Outcome Measure for Expert Witness Research.” *Behavioral Sciences & the Law* 28, no. 6 (2010): 892-907.
- Brown, Walter T. “The Scientific Case for Creation: 108 Categories of Evidence.” In *Evolution Versus Creationisms: The Public Education Controversy* edited by J. Peter Zetterbeg, 199-207. The Oryx Press: Phoenix, AZ, 1983.
- Jennings Bryan, William. *The Menace of Darwinism*. New York: Fleming H. Revell Company, 1922.
- Burke, Kenneth. *A Rhetoric of Motives*. Berkeley: University of California Press, 1969.
- Bybee, Joan, Revere Perkins, and William Pagliuca. *The Evolution of Grammar: Tense, Aspect, and Modality in the Languages of the World*. Chicago: University of Chicago Press, 1994.
- Caudill, Edward. *Intelligently Designed: How Creationists Built the Campaign Against Evolution*. Urbana, Chicago, and Springfield: University of Illinois Press, 2013.

- Cavanaugh, Michael. "Scientific Creationism and Rationality." *Nature* 315, (May 16, 1985): 185-189.
- Ceccarelli, Leah. "The Polysemic Facepalm: Fauci as Rhetorically Savvy Scientist Citizen." *Philosophy and Rhetoric* 53, no. 3 (2020): 239-245.
- Ceccarelli, Leah. "Manufactured Scientific Controversy: Science, Rhetoric, and Public Debate." *Rhetoric and Public Affairs* 14, no. 2, (Summer 2011): 195-228.
- Chaemsaitong, Krisda. "Performing Self on the Witness Stand: Stance and Relational Work in Expert Witness Testimony." *Discourse and Society* 23, no. 5 (2012): 465-486.
- Chafe, Wallace and Johanna Nichols. *Evidentiality: The Linguistic Coding of Epistemology*. Norwood, NJ: Ablex Publishing Corporation, 1986.
- Chindamo, Massimo, Jens Allwood, and Elisabeth Ahlsen, "Some Suggestions for the Study of Stance in Communication." *2012 International Conference on Privacy, Security, Risk and Trust and 2012 International Conference on Social Computing* (2012): 617-622.
- Clark, Constance Areson. "'You Are Here': Missing Links, Chains of Being, and the Language of Cartoons." *Isis* 100, no. 3, 2009: 571-589.
- Coady, C.A.J. *Testimony: A Philosophical Study*. New York: Oxford University Press, 1992.
- Condit, Celeste. "Public Health Experts, Expertise, and Ebola: A Relational Theory of Ethos." *Rhetoric and Public Affairs* 22, no. 2 (2019): 177-216.
- Condit, Celeste. "The Rhetoric of Intelligent Design." *Rhetoric and Public Affairs* 1, no. 4, (1998): 593-602.
- Conkin, Paul. *When All the Gods Trembled: Darwinism, Scopes, and American Intellectuals*. Oxford: Rowman and Littlefield, 1998.
- Conley, John and William O'Barr. *Just Words: Law, Language, and Power*. Chicago: University of Chicago Press, 1998.
- Cooper, John and DS Hutchinson, eds. *Complete Works of Plato*. Indianapolis: Hackett Publishing Company, 1997.
- Darwin, Charles. *The Origin of Species by Means of Natural Selection, Or, The Preservation of Favoured Races in the Struggle for Life*. London: John Murray, 1872.
- Daubert v. Merrell Dow Pharmaceuticals*, 509 U.S. 579 (1993).
- Davies, Mark and Dee Gardner. *Frequency Dictionary of Contemporary English*. London and

New York: Routledge, 2010.

- DeWolf, David, John West, Casey Luskin, and Jonathan Witt. *Traipsing into Evolution: Intelligent Design and the Kitzmiller v. Dover Decision*. Seattle: Discovery Institute Press, 2006.
- DeVasto, Daniele. "Being Expert: L'Aquila and Issues of Inclusion in Science-Policy Decision Making." *Social Epistemology* 30, no. 4, (August 2016): 372-397.
- Dworkin, Ronald. *Law's Empire*. Cambridge: Harvard University Press, 1986.
- Edis, Taner. "A Revolt Against Expertise: Pseudoscience, Right-Wing Populism, and Post-Trust Politics," *Disputatio* 9, no. 13, (2020): 1-29.
- Edwards, Frederick. "Why Creationism Should Not Be Taught as Science: The Legal Issues." In *Evolution Versus Creationisms: The Public Education Controversy* edited by J. Peter Zetterbeg. The Oryx Press: Phoenix, AZ, 1983.
- Engesser, Sven, Nayla Fawzi, and Anders Olof Larsson. "Populist Online Communication." *Information, Communication, and Society* 20, no. 9, (2017): 1279-1292.
- Ericsson, K. Anders, and Jacqui Smith. *Toward a General Theory of Expertise: Prospects and Limits*. Cambridge; New York: Cambridge University Press, 1991.
- Everson v. Board of Education*. 330 U.S. 1 (1947).
- Advertisement. *Evolution: A Journal of Nature* 1, no. 1, 1927: 16.
- Feltovich, Paul J., Michael J. Prietula, and K. Anders Ericsson. "Studies of Expertise from Psychological Perspectives: Historical Foundations and Recurrent Themes." *Cambridge Handbook of Expertise and Expert Performance*, edited by K. Anders Ericsson, Robert R. Hoffman, and Aaron Kozbelt. Cambridge: Cambridge University Press, 2018.
- Forrest, Barbara and Paul R. Gross. *Creationism's Trojan Horse*. Oxford University Press, 2004.
- Freeman, David. *Wrong: Why Experts Keep Failing Us—and How to Know When Not to Trust Them*. New York: Little, Brown and Co., 2010.
- Freeman, James. "The Limits of Anthony Fauci's Expertise." *The Wall Street Journal*, May 13, 2020, <https://www.wsj.com/articles/the-limits-of-anthony-faucis-expertise-11589392347>.
- Frye v. United States*. 293 F. 1013 D.C. Cir. (1923).

- Furniss, Norman. *The Fundamentalist Controversy*. Hamden, Connecticut: Archon Books, 1963.
- Garner, Bryan. *The Chicago Guide to English Grammar, Punctuation, and Usage*. Chicago, University of Chicago Press, 2016.
- General Electric Co. v. Joiner. 522 U.S. 136 (1997).
- Geisler, Norman. *Creation and the Courts: Eighty Years of Conflict in the Classroom and the Courtroom*. Wheaton, IL: Crossway, 2007.
- Geisler, Norman. *The Creator in the Courtroom: The Controversial Arkansas Creation-Evolution Trial*. Milford, MI: Mott Media, 1982.
- Gish, Duane. "Creation, Evolution, and the Historical Evidence." In *But Is It Science* edited by Robert Pennock and Michael Ruse, 231-252. Prometheus Books: Amherst, NY, 2009.
- Gish, Duane, Richard Bliss, and Wendell Bird. "Summary of Scientific Evidence for Creation." In *Evolution Versus Creationisms: The Public Education Controversy* edited by J. Peter Zetterbeg, 199-207. The Oryx Press: Phoenix, AZ, 1983.
- Gloege, Timothy. *Guaranteed Pure: The Moody Bible Institute, Business, and the Making of Modern Evangelicalism*. Chapel Hill: University of North Carolina Press, 2015.
- Golan, Tal. *Laws of Men and Laws of Nature*. Cambridge: Harvard University Press, 2004.
- Goodnight, Thomas. "The Personal, Technical, and Public Spheres of Argument: A Speculative Inquiry into the Art of Public Deliberation." *Argument and Advocacy* 48, no. 4, (Spring 2012): 198-210.
- Greenwalt, Kent. *Does God Belong in Public Schools?* Princeton and Oxford: Princeton University Press, 2005.
- Guttman, Cheryl. "Expert witness testimony tricky: M.D. suggests national expert witness clearinghouse." *Dermatology Times* 9, no. 7 (2006): 36.
- Haack, Susan. *Evidence Matters: Science, Proof, and Truth in the Law*. New York: Cambridge University Press, 2014.
- Haarscher, Guy. "Perelman's Pseudo-Argument as Applied to the Creationism Controversy." *Argumentation* 23, no. 3 (2009): 361-374.
- Haas, Bruce and Michael Kleine. "The Rhetoric of Junk Science." *Technical Communication Quarterly* 12, no. 3 (2003): 267-284.
- Hardwig, John. "Epistemic Dependence." *The Journal of Philosophy* 82, no. 7 (Jul 1985): 335-349.

- Hardy, Jörg. "Seeking Truth and Taking Care for Common Goods—Plato on Expertise and Recognizing Experts." *Episteme* 7, no. 1, (2010): 7-22.
- Hartelius, E. Johanna. *The Rhetoric of Expertise*. Lanham, Lexington Books, 2011.
- Heffernan, Virginia. "How to Stop Worrying that CRT Will Corrupt Your Kids." *The Los Angeles Times*, August 20, 2021, <https://www.latimes.com/opinion/story/2021-08-20/critical-race-theory-parents-school-boards-teachers>.
- Herlihy, Mark E. "Trying Creation: Scientific Disputes and Legal Strategies." In *Creationism, Science, and the Law* edited by Marcel LaFollette, 96-103. Cambridge, MA: MIT Press, 1983.
- Hilts, Phillip. "Creationist Tells of Belief in UFOs, Satan, Occult." *Washington Post*, December 12, 1981, <https://www.washingtonpost.com/archive/politics/1981/12/12/creationist-tells-of-belief-in-ufos-satan-occult/3f60dea6-7cdb-4556-8126-e86bfec0de1e/>.
- Hockett, C.F. "Language and Scientific Creationism." *Forum Linguisticum* 8, no. 1 (1984): 59-68.
- Hodge, Charles. *What is Darwinism?* New York: Scribner, Armstrong, and Company, 1874.
- Holden, Charles. "Experts Beware: Is America Headed for a Scopes Moment over Critical Race Theory?." *History News Network*, June 20, 2021, <https://historynewsnetwork.org/article/180483>.
- Holtzman, Eric and David Klasfeld. "The Arkansas Creationism Trial: An Overview of the Legal and Scientific Issues." In *Creationism, Science, and the Law* edited by Marcel LaFollette, 85-92. Cambridge, MA: MIT Press, 1983.
- Höst, Gunnar E. and Gustav Bohlin. "Engines of Creation? Intelligent Design, Machine Metaphors and Visual Rhetoric." *Leonardo* 48, no. 1 (2015): 80-81.
- Hostetler, Michael. "William Jennings Bryan as Demosthenes: The Scopes Trial and the Undelivered Oration 'On Evolution'." *Western Journal of Communication* 62, no. 2, (1998): 165-180.
- Hikins, James and Richard Cherwitz. "On the Ontological and Epistemological Dimensions of Expertise: Why 'Reality' and 'Truth' Matter and How We Might Find Them." *Social Epistemology* 25, no. 3 (2011): 291-308.
- Hume, David. *An Enquiry Concerning Human Understanding*. Indianapolis: Hackett Publishing Company, 1993.
- Huskinson, Benjamin. *American Creationism, Creation Science, and Intelligent Design*.

- Cham, Switzerland: Palgrave Macmillian: 2020.
- Hyland, Ken. *Disciplinary Discourses: Social Interactions in Academic Writing*. Ann Arbor: University of Michigan Press, 2004.
- Jantzen, Benjamin C. *An Introduction to Design Arguments*. Cambridge: Cambridge University Press, 2014.
- Johnson, Phillip. *Darwin on Trial*. Lanham, MD: Regnery/Gateway, 1991.
- Jones, John E. "Opinion in *Kitzmiller v. Dover*." December 20, 2005.  
[https://ncse.ngo/files/pub/legal/kitzmiller/highlights/2005-12-20\\_Kitzmiller\\_decision.pdf](https://ncse.ngo/files/pub/legal/kitzmiller/highlights/2005-12-20_Kitzmiller_decision.pdf)
- Jones, Sarah. "How to Manufacture a Moral Panic." *New York Magazine*, July 11, 2021,  
<https://nymag.com/intelligencer/2021/07/christopher-rufo-and-the-critical-race-theory-moral-panic.html>.
- Karkkainen, Elise. *Epistemic Stance in English Conversation*. Amsterdam/Philadelphia: John Benjamins Publishing Company, 2003.
- Kitzmiller v. Dover Area School District*, 400 F. Supp. 2d 707 (M.D. Pa. 2005).
- Kritzer, Herbert. "The Arts of Persuasion in Science and Law: Conflicting Norms in the Courtroom." *Law and Contemporary Problems* 72, no. 1 (Winter 2009): 41-61.
- Koppl, Roger. *Expert Failure*. Cambridge: Cambridge University Press, 2018.
- Krauss, Daniel and Bruce Sales. "The Effects of Clinical and Scientific Expert Testimony in Juror Decision Making in Capital Sentencing," *Psychology, Public Policy, and Law* 7, no. 2, (2001): 267-310.
- Kumho Tire Co. v. Carmichael*, 526 U.S. 137 (1999).
- Martin, T.T. *Hell and the High Schools: Christ or Evolution, Which?* Kansas City: Western Baptist Publishing Company, 1923.
- La Follette, Marcel C. "Creationism in the News: Mass Media Coverage of the Arkansas Trial." In *Creationism, Science, and the Law: The Arkansas Case* edited by Marcel C. La Follette, 190-215. Cambridge, MA: The MIT Press, 1983.
- Lackey, Jennifer. *Learning From Words: Testimony as a Source of Knowledge*. New York: Oxford University Press, 2008.
- Lancaster, Guy. "'This Evolution Bit is Straight from Satan': *McLean v. Arkansas Board of Education* and the Democratization of Southern Christianity." *Religion and Education* 33, no. 3 (2006): 69-89.

- Laudan, Larry. "The Demise of the Demarcation Problem" In *But Is It Science* edited. by Robert Pennock and Michael Ruse, 331-336. Prometheus Books: Amherst, NY, 2009.
- Lanham, Richard. *A Handlist of Rhetorical Terms*. Berkeley, Los Angeles, Oxford: University of California Press, 1991.
- Landsman, Stephen. "Of Witches, Madmen, and Product Liability: An Historical Survey of the Use of Expert Testimony." *Behavioral Science and Law* 13, no. 2, (1995): 131-157.
- Andrew Larson. "Bryan, William Jennings (1860–1925)." In *Social and Political Life*, edited by Jeffrey A. Johnson, 22-25. Vol. 1 of *Reforming America: A Thematic Encyclopedia and Document Collection of the Progressive Era*. Santa Barbara, CA: ABC-CLIO, 2017.
- Larson, Edward. *Summer for The Gods: The Scopes Trial and America's Continuing Debate Over Science and Religion*. New York: Basic Books, 2006.
- Larson, Edward. *Trial and Error: The American Controversy Over Creation and Evolution*. Oxford, New York: Oxford University Press, 2003.
- Lawrence, Jerome and Robert E. Lee. *Inherit the Wind*. Ballantine Books: New York, 2003.
- Learned Hand, Billings. "Historical and Practical Considerations Regarding Expert Testimony." *Harvard Law Review* 15, no. 1, (May, 1901): 40-58.
- Lessl, Thomas. "Heresy, Orthodoxy, and the Politics of Science." *Quarterly Journal of Speech* 74, no 1. (1988): 18-34.
- Lessl, Thomas. "Punctuation in the Constitution of Public Identities: Primary and Secondary Sequences in the Scopes Trial." *Communication Theory* 3, no. 2 (1993): 91-111.
- Lessl, Thomas. *Rhetorical Darwinism: Religion, Evolution, and the Scientific Identity*. Waco: Baylor University Press, 2012.
- Lienesch, Michael. *In The Beginning: Fundamentalism, The Scopes Trial, and The Making of The Antievolution Movement*. University of North Carolina Press, Chapel Hill: 2007.
- Livingstone, David. "Myth 17: That Huxley Defeated Wilberforce in Their Debate Over Evolution and Religion." In *Galileo Goes to Jail and Other Myths about Science and Religion*, edited by Ronald Numbers, 152-160. Cambridge, Massachusetts: Harvard University Press, 2009.
- Lynne, John and Henry F. Howe. "The Rhetoric of Expertise: E.O. Wilson and Sociobiology." *The Quarterly Journal of Speech* 76, no. 2, (1990): 134-151.
- Maddux, Kristy. "Fundamentalist Fool or Populist Paragon? William Jennings Bryan and The

- Campaign Against Evolutionary Theory.” *Rhetoric and Public Affairs* 16, no. 3 (2013): 489-520.
- Marsden, George. *Fundamentalism and American Culture: The Shaping of Twentieth Century Evangelicalism, 1870 – 1925*. New York: Oxford University Press, 2006.
- Matilal, Bimal, and Arindam Chakrabarti. *Knowing From Words: Western and Indian Philosophical Analysis of Understanding and Testimony*. Boston: Kluwer Academic Publishers, 1994.
- McNair, Matthew. “Rhetorical Continuity: Evolution, Creation Science, and Intelligent Design.” In *First Amendment Studies in Arkansas* edited by Stephen Smith, 237-238. University of Arkansas Press: Little Rock, 2016.
- Melott, Adrian. “Intelligent Design is Creationism in a Cheap Tuxedo.” *Physics Today* 55, no. 6 (2002): 48-50.
- Meyerstein, Israela and James Todd. “On the Witness Stand: The Family Therapist and Expert Testimony” *The American Journal of Family Therapy* 8, no. 4 (1980): 43-51.
- Milich, Paul. “Controversial Science in the Courtroom: Daubert and the Law’s Hubris.” *Emory Law Journal* 43, no. 3, (1993): 913-926.
- Miller, Carolyn. “The Presumptions of Expertise: The Role of Ethos in Risk Analysis.” *Configurations* 12, no. 2 (Spring 2003): 163-202.
- Miller, Carrie. “Why Don’t Americans Trust Experts?.” *The Daily Circuit*, Minnesota Public Radio, October 19, 2014, <https://www.mprnews.org/story/2014/10/20/daily-circuit-trusting-experts>.
- Moore, John. *From Genesis to Genetics: The Case of Evolution and Creationism*. Berkeley and Los Angeles: University of California Press, 2002.
- Moreno, Joelle and Brian Holmgren. “Dissent into Confusion: The Supreme Court, Denialism, and the False “Scientific” Controversy over Shaken Baby Syndrome.” *Utah Law Review* 2013, no. 1 (2013): 153-218.
- Morrison, Gary Saul. “Partisan Science in America.” *The Wall Street Journal*, October 11, 2021, <https://www.wsj.com/articles/partisan-science-antiscience-facts-misrepresentation-fauci-lancet-lab-leak-11633960740>.
- Nelkin, Dorothy. *The Creation Controversy: Science or Scripture in the Schools*. Beacon: Boston, 1994.
- Nguyen, C. Thi. “Cognitive Islands and Runaway Echo Chambers: Problems for Epistemic Dependence on Experts.” *Synthese* 197, no. 7, (2020): 2803-2821.

Nichols, Thomas. *The Death of Expertise: The Campaign Against Established Knowledge and Why It Matters*. New York: Oxford University Press, 2017.

Numbers, Ronald. "Clarifying Creationism: Five Common Myths." *History and Philosophy of the Life Sciences* 33, no. 1 (2011): 135-137.

Numbers, Ronald. *The Creationists: From Scientific Creationism to Intelligent Design*. Cambridge, Massachusetts: Harvard University Press, 2006.

Oreskes, Naomi and Erik M. Conway. *Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Climate Change*. New York: Bloomsbury Publishing, 2011

Orr, James. "Science and Christian Faith" in *The Fundamentals: The Famous Sourcebook of Foundational Biblical Truths*, edited by R.A. Torrey, 125-136. Grand Rapids: Kregel Publications, 1990.

Paley, William. *Natural Theology*. New York: Harper, 1865.

Palmer, Frank. *Modality and the English Modals*. New York: Longman, Inc., 1990.

"Paralipsis." *Manner of Speaking*, August 15, 2011,  
<https://mannerofspeaking.org/2011/08/15/rhetorical-devices-paralipsis/>.

Park, Roger, David Leonard, Aviva Orenstein, and Steven Goldberg. *Evidence Law: A Student's Guide to the Law of Evidence as Applied in American Trials*. St. Paul: West Academic Publishing, 2011.

Perry, John and Marvin Olasky. *Monkey Business: The True of the Scopes Trial*. Nashville: B&H Books, 2005.

Pew Research Center. "Religion and Science." October 22 2015,  
<https://www.pewresearch.org/science/2015/10/22/science-and-religion/>.

Phelps, Lynn and Edwin Cohen. "The Wilberforce-Huxley Debate" *Western Speech* 37, no. 1, (1973): 56-64.

Popper, Karl. "Darwinism as a Metaphysical Research Programme." In *The Philosophy of Karl Popper* edited. by Paul Schlipp, 133-143. La Salle, IL: Open Court, 1974.

Popper, Karl. *The Logic of Scientific Discovery*. London: Routledge Classics, 2002.

Prindle, David and Tse-min Lin. "Evolution and Public Opinion." In David Prindle, *The Politics of Evolution*, 89-115. New York and London: Routledge, 2015.

- Prelli, Lawrence. *A Rhetoric of Science: Inventing Scientific Discourse*. Columbia: University of South Carolina Press, 1989.
- Quinlan, Maggie. “‘Masking is a satanic ritual’: Group protests outside Spokane health officer’s house over state mask mandate.” *The Spokesman-Review*, July 21, 2020.
- Ravitch, Frank. *Marketing Intelligent Design: Law and the Creationist Agenda*. Cambridge: Cambridge University Press, 2011.
- Redington, Luke. “Methodology on Trial: The Rhetorical Function of Toulminian Warrants in Expert Testimony.” *Journal of Technical Writing and Communication* 47, no. 4 (2017): 396-418.
- Reid, Thomas. *Inquiry into the Human Mind*. Edinburgh: Edinburgh University Press, 1997.
- Rieppel, Oliver. *Evolutionary Theory and the Creation Controversy*. London: Springer, 2011.
- Recker, Doren. “How to Confuse Organisms with Mousetraps: Machine Metaphors and Intelligent Design.” *Zygon* 45, no. 3 (2010): 647-654.
- Ropeik, David. “The L Aquila Verdict: A Judgment Not against Science, but against a Failure of Science Communication.” *Scientific American*, October 22, 2012, <https://blogs.scientificamerican.com/guest-blog/the-laquila-verdict-a-judgment-not-against-science-but-against-a-failure-of-science-communication/>.
- Ross, Marcus. “Who Believes What? Clearing Up Confusion Over Intelligent Design and Young-Earth Creationism.” *Journal of Geoscience Education* 53, no. 3 (2005): 319-323.
- Ruse, Michael. *Darwin and Design: Does Evolution Have a Purpose?* Cambridge, MA: Harvard University Press, 2003.
- Ruse, Michael. “Pro Judice.” In *But Is It Science* edited by Robert Pennock and Michael Ruse, 337-344. Prometheus Books: Amherst, NY, 2009.
- Ruse, Michael. *The Evolution-Creation Struggle*. Cambridge, Massachusetts; London, England: Harvard University Press, 2006.
- Sandeen, Ernest. *The Roots of Fundamentalism: British and American Millenarianism, 1800 – 1930*. Chicago, London: University of Chicago Press, 2008.
- Sanger-Katz, Margot. “On Coronavirus, Americans Still Trust the Experts.” *The New York Times*, June 30, 2020, The Upshot, <https://www.nytimes.com/2020/06/27/upshot/coronavirus-americans-trust-experts.html>.
- Scott, Eugenie. “Creationism: Still Crazy After All These Years.” *Richard Dawkins Foundation for Reason & Science*, December 3, 2009,

<https://www.youtube.com/watch?v=pItVGYa863k>.

- Searle, John. *Speech Acts: An Essay in the Philosophy of Language*. Cambridge: Cambridge University Press, 1969.
- Selinger Evan, and Robert P. Crease, eds. *The Philosophy of Expertise*. New York: Columbia University Press, 2006.
- Shapiro, Adam. *Trying Biology: The Scopes Trial, Textbooks, and the Antievolution Movement*. Chicago: University of Chicago Press, 2013.
- Singer, Peter. "Moral Experts." *Analysis* 32, no. 4, (1974): 115-117.
- Smout, Kary D. *The Creation/evolution Controversy: A Battle for Cultural Power*. Westport, CT: Praeger Publishers, 1998.
- Solan, Peter. "Can the Legal System Use Experts on Meaning?." *Tennessee Law Review* 66, no. 4, (1999): 1167-1200.
- Stygall, Gail. "A Different Class of Witnesses: Experts in the Courtroom." *Discourse Studies: An Interdisciplinary Journal for the Study of Text and Talk* 3, no. 3, (2001): 327-349.
- Taylor, Charles Alan. *Defining Science: A Rhetoric of Demarcation*. Madison: The University of Wisconsin Press, 1996.
- Thayer, James. *Select Case on Evidence at the Common Law*. Cambridge: Charles W. Sever, 1892.
- Tindall, George Brown and David Emory Shi. *America: A Narrative History*. New York: Norton, 2013.
- The Discovery Institute. "The 'Wedge' Document: So What?." July 3, 2005, <https://www.discovery.org/m/2019/04/Wedge-Document-So-What.pdf>.
- The *McLean v. Arkansas* Documentation Project. February 24, 2005, [http://www.antievolution.org/projects/mclean/new\\_site/index.htm](http://www.antievolution.org/projects/mclean/new_site/index.htm).
- Thurs, Daniel Patrick. *Science Talk: Changing Notions of Science in American Popular Culture*. Rutgers: Rutgers University Press, 2007.
- Tom, Joshua. "Social Origins of Scientific Deviance: Examining Creationism and Global Warming Skepticism." *Sociological Perspectives* 61, no. 3 (2018): 341-360.
- Toulmin, Stephen. *The Uses of Argument*. Cambridge: Cambridge University Press, 2003.
- Walton, Douglas. *Informal Logic: A Pragmatic Approach*. Cambridge: Cambridge University

Press, 2008

Weaver, Richard. *The Ethics of Rhetoric*. New York: Routledge, 2009.

“Warrior Mom Fights Back Against Teaching Critical Race Theory,”  
<https://michaelsavage.com/watch-warrior-mom-fights-back-against-teaching-critical-race-theory/>.

Ward, Gregory, Betty J. Birner, and Jeffrey P. Kaplan. “A pragmatic analysis of the epistemic *would* construction in English.” In Roberta Facchinetti, Manfred Krug, and Frank Palmer, *Modality in Contemporary English*. Berlin, New York: Mouton de Gruyter, 2003.

Webb, George. *The Evolution Controversy in America*. Lexington: University Press of Kentucky, 1994.

Weisser, Martin. *Practical Corpus Linguistics: An Introduction to Corpus-Based Language Analysis*. Oxford: Wiley Blackwell, 2016.

White, Andrew Dickson. *A History of the Warfare of Science with Theology, Volume II*. New York: Dover Publications, 1960.

Wilkins, John and Wesley Elsberry. “The Advantages of Theft Over Toil: The Design Inference and Arguing from Ignorance.” *Biology and Philosophy* 16, no. 5 (2001): 709-722.

Winiiecki, Don. “The Expert Witness and Courtroom Discourse: Applying Micro and Macro Forms of Discourse Analysis to Study Process and the 'Doings of Doings' for Individuals and for Society.” *Discourse and Society* 19, no. 6 (2008): 765-781.

Wright, George Frederick. “The Passing of Evolution” in *The Fundamentals: The Famous Sourcebook of Foundational Biblical Truths*, edited by R.A. Torrey, 613-626. Grand Rapids: Kregel Publications, 1990.

Young, Christian and Mark Largent, eds. *Evolutionism and Creationism: A Documentary and Reference Guide*. Westport, Connecticut: Greenwood Press, 2007.