Introduction

For the last several years, we have been conducting research and writing about the teaching of evolution – and the teaching of creationism – in America's public schools. From time to time, we talk to biologists, paleontologists, and other scientists, and they inevitably tell us that they simply do not understand the United States today. They do not understand why so many ordinary citizens do not accept that evolution occurred, and they are shocked that three serious candidates for the presidency stated that they did not believe in evolution.

Scientists are at a loss to understand how so many educated Americans believe that creationism should be accorded "equal time" in science education. And they cannot comprehend why evolution occupies such a marginal place in the high school biology curriculum and why it continues to be controversial today. How is it possible that we are still in a "war" over evolution?

Regardless of your personal beliefs and opinions, it is useful to understand why scientists are so puzzled by the way things are today. And to do that, we need to take a scientist's perspective, which goes something like this.

When Darwin returned from his voyage on the *Beagle*, he speculated that natural selection could transform species and that currently living species and extinct species might share common ancestors. In 1837, he sketched the now famous "tree of life" in his notebook and wrote, in the upper margin, "I think."

For the next 22 years, Darwin investigated hundreds of kinds of evidence bearing on his initial hunch; this he reported 150 years ago in *The Origin of Species*. At the time, many scientists were skeptical – the

ideas were new, after all. Yet, the evidence was so voluminous and carefully documented that the notion of common ancestry would become quickly and widely accepted. As for the mechanism Darwin proposed – natural selection – *The Origin* fell short of absolute proof, and scientists debated this idea for many decades.

But over the next 60 years, scientists were won over by an accumulation of evidence, all of which pointed to the same basic conclusions – that the earth was extremely old (far older than was understood in Darwin's day), that the progression of fossils in the geological record suggested descent with modification, and that these fossils and the findings from comparative anatomy suggested that species living in the 1920s – apes and humans, for example – had common ancestors.

Indeed, by the 1920s, skepticism concerning the fact of common ancestry was essentially absent from the scientific community. The American Association for the Advancement of Science passed a resolution in 1922 trying to set the record straight. Amazingly, this reads as if it could have been issued by the same organization today – nearly 90 years later.

1. The Council of the Association affirms that, so far as the scientific evidences of evolution of plants and animals and man are concerned, there is no ground whatever for the assertion that these evidences constitute a "mere guess." No scientific generalization is more strongly supported by thoroughly tested evidences than is that of organic evolution.
2. The Council of the Association affirms that the evidence in favor of the evolution of man are sufficient to convince every scientist of note in the world, and that these evidences are increasing in number and importance every year (Council of the American Association for the Advancement of Science, December 26, 1922).

By 1925, in testimony to those attending the *Scopes* "monkey trial" on July 15, 1925, biologist Maynard Metcalf reported, "I am somewhat acquainted personally with nearly all the zoologists in America . . . Of all these hundreds of men, not one fails to believe as a matter of course, in view of the evidence, that evolution has occurred" (quoted in Gieryn, Bevins, and Zehr 1985, 397; see also Moore 2002a, 38, 377).

When Metcalf testified, Mendel's model of genetic inheritance was universally accepted and widely applied. By the 1940s, findings from genetics, ecology, and paleontology were independently confirming the same hypotheses.

In the 1960s, the National Science Foundation (NSF) led an effort to rewrite high school biology textbooks so that they reflected the scientific consensus at the time. The NSF-sponsored textbooks all forthrightly argued that evolution was a fact and that natural selection and descent with modification were essential to understand modern biology. By 1963, the evolution war had seemingly been won.

Today, scientists ask this: How is it, then, 150 years after *The Origin of Species,* 100 years after the birth of modern genetics, and 50 years after scientists made a major effort to rework textbooks to their liking, that teaching evolution in public schools remains a controversial subject?

The most obvious way to answer this question is to view evolution controversies as rooted in a still simmering *battle of ideas*, one that is inextricably linked to conservative Protestant theology, to an ongoing tension between traditionalism and modernity, and even between science and religion generally. We agree, and we have something to contribute to this particular explanation. But a disagreement about ideas is not sufficient to account for the amazing durability of this conflict on the American scene. A more complete explanation for why the conflict continues to exist must account for *politics*. And not just any kind of politics, but a politics concerning the very meaning of democracy in America. This is why we believe that two political scientists can contribute something to our understanding of the history of the evolution conflict and help us see more clearly the dimensions of the conflict today.

As political scientists, we highlight a key normative question: Who *should* govern the nation's public schools and determine what students should learn? Much of the debate concerning evolution and creationism in the United States, we will show, is fundamentally a debate about who should decide what students are taught: Should decisions be made by state officials representing voters and taxpayers? By federal courts looking out for individuals' civil liberties? By scientists who claim unique expertise concerning the content and nature of science? By educational policy makers and bureaucrats with expertise

in pedagogy, assessment, and effectiveness? Or should the final decision lie with individual classroom teachers, guided by their training, experience, personal values, and strong professional norms?

In light of this normative question of who should govern our nation's classrooms, we explore two broad empirical questions:

- How is education policy made in each of the fifty states?
- How is policy actually implemented in each of the thousands of individual classrooms throughout the nation?

To answer these questions, we rely on the best practices of political science, which implies a disinterested search for evidence-based answers to our questions. Disinterested, in this sense, does not mean that we do not care about our findings; quite the contrary. We each have school-age children and care deeply about science education in our nation's public schools. But we have done our best to follow the evidence and report it objectively, even when that evidence has proven to be disturbing or has not confirmed our initial hypotheses. We have sought multiple and independent sources of evidence whenever possible, reporting our conclusions with confidence only when they converge. For example, in Chapter 3 we use polling data from the conservative Fox News, from the liberal People for the American Way, and from several university-based surveys that all lead to the same conclusion. The grants that supported much of our research were awarded after rigorous peer review, and some of the preliminary research findings also passed the muster of peer review before being published in scientific journals. Even at the risk of seeming too technical at times (readers can skip some of this material, of course), we have reported our methods and procedures in sufficient detail so that other researchers can independently replicate and verify our findings. And we provide our original data freely to all scholars who request it. Thus, we hope that all readers will have confidence in our empirical conclusions even though they may not share our political values. From time to time, we will express our opinions. But readers should have no difficulty in noting where the scientific evidence ends and our own values begin.

1 Who Should Decide What Children Are Taught?

Teachers in public schools must teach what the taxpayers desire taught.

William Jennings Bryan (1924)[1]

The people have spoken on this subject and have shown by an overwhelming vote that they do not want their children taught the theory of evolution in the public schools.

Bruce Bennett, prosecutor in *Epperson v. Arkansas* (1968). Susan Epperson sought to teach evolution in Little Rock in violation of Arkansas state law.

The people of Louisiana . . . are quite entitled . . . to have whatever scientific evidence there may be against evolution presented in their schools . . .

Antonin Scalia in dissent in *Edwards v. Aguillard* (1987). Don Aguillard was a high school teacher who challenged a Louisiana law that required the teaching of Creation Science along with evolution.

To refer the students to "*Of Pandas and People*" as if it is a scientific resource breaches my ethical obligation to provide them with scientific knowledge that is supported by recognized scientific proof or theory.

High school science teachers in Dover, PA, in response to a district requirement that they read a statement promoting an Intelligent Design textbook as an alternative to Evolution (2005).

JOHN THOMAS SCOPES, a twenty-four-year-old football coach and general science teacher in Dayton, Tennessee, is the often

[1] Sources of epigraphs: Bryan (1924, 154). Bennett quoted in Moore (2002a, 52–53). Teachers' statement cited in *Kitzmiller v. Dover* (2005, 127).

forgotten figure in the 1925 *Scopes* "monkey trial," dominated as it was by the expansive personalities of William Jennings Bryan, Clarence Darrow, and H. L. Mencken.[2] Recruited by local businessmen interested in generating attention for Dayton, Scopes acknowledged using a text – one used by most science teachers in Tennessee – that taught human evolution in contradiction to the biblical account in Genesis, a violation of Tennessee's recently passed Butler Act.[3] Scopes soon found himself in the middle of one of the most closely watched trials in U.S. history. Radio station WGN of Chicago broadcast the trial live each day, and all of the nation's major newspapers sent reporters to Dayton, with many printing verbatim transcripts of the trial. Syndicated columnist H. L. Mencken made daily reports that were published in scores of newspapers.

Scopes' jury trial in Dayton and his appeal to the Tennessee Supreme Court were dominated by three different debates: one substantive, one procedural, and one concerning the autonomy of teachers in their classrooms. The substantive debate is one familiar to Americans today: How compelling is the scientific evidence for a very old earth, evolution in general, and the evolution of human beings in particular? In addition, if the evidence for evolution were strong, would this contradict the teachings of the Bible? These questions came to the fore when William Jennings Bryan took the stand for four hours and debated questions of biblical interpretation and human origins with defense attorney Clarence Darrow.

The procedural theme in *Scopes* concerned democracy: Should ordinary citizens – acting through their elected representatives – be able to set curricular policies for public schools? Scopes' legal team, supported by funds from the American Civil Liberties Union (ACLU), argued that Tennessee's Butler Act was unconstitutional. Their tactics at the trial were intended to make it possible to appeal the case to the U.S. Supreme Court in the hope that the Court would invalidate the

[2] As Scopes himself described it, "So I sat speechless, a ringside observer at my own trial, until the end of the circus" (quoted in Larson 1997, 173).

[3] The Butler Act (officially titled *An Act Prohibiting the Teaching of Evolution in all the Universities, Normals and all other public schools of Tennessee*) read that it was in violation of the law to "teach any theory that denies the story of the Divine Creation of man as taught in the Bible, and to teach instead that man is descended from a lower order of animals." (See the full text of the Act at http://www.law.umkc.edu/faculty/projects/ftrials/scopes/tennstat.htm; last accessed July 1, 2009).

democratically enacted law. In opposition, the prosecution insisted that the Tennessee legislature, acting on behalf of the state's citizens, had the right to dictate what teachers – as public employees – taught to their students.

The final theme concerns the academic freedom of public school teachers. Academic freedom is a right we often associate with university professors, but it was championed by proponents of teaching evolution early in the twentieth century. Indeed, in describing the strategy of the *Scopes* trial's defense teams, the *New York Times* reported, "State Will Denounce Scientific Theory, Teacher Will Defend Academic Freedom."[4] Somewhat ironically, the principle of academic freedom is currently advocated by supporters of creationism and intelligent design.

The Criminal Court of Rhea County ignored the substantive questions. Indeed, Judge John Raulston excluded expert testimony from scientists and clergy that might have addressed these questions. Although he permitted Bryan to take the stand as an expert on the Bible, for the majority of the trial, his procedural rulings steered the case narrowly toward the question of academic freedom and the facts of the case: Do teachers have the freedom to ignore a state prohibition of what can be taught, and if not, did Scopes really teach evolution? Upon appeal, the Supreme Court of Tennessee ignored the substantive debate entirely and instead focused on questions of democratic practice. Writing for the majority, Chief Justice Grafton Green wrote:

> If the legislature thinks that, by reason of popular prejudice, the cause of education and the study of Science generally, will be promoted by forbidding the teaching of evolution in the schools of the State, we can think of no grounds to justify the court's interference.[5]

As to Scopes himself, the Tennessee Supreme Court concluded that, as a public employee, it was his responsibility to teach whatever the state said he should teach.

The *Scopes* monkey trial retains its relevance because these same three themes characterize the evolution wars today. The substantive debate concerning human origins, evolutionary biology, and

[4] "Evolution Trial Raises Two Sharp Issues." *New York Times*, May 31, 1925, XX4.
[5] Quoted in Moore (2002a, 292).

alternative explanations has been subject to an enormous amount of scholarly writing. We will have quite a bit to say about this, particularly from the perspective of U.S. public opinion, state curricular policies, and teachers' approaches to human origins in the classroom. However, this book is also concerned with who decides in a democracy. What is the proper role of *the people* and their elected representatives, the courts, and scientific and educational experts? Most especially, what is the role of teachers who, like John Thomas Scopes, are asked to implement public policy every day in their classrooms and can sometimes find that their classrooms have become ground zero in the evolution wars?

SCHOOL GOVERNANCE AND DEMOCRACY IN THE UNITED STATES

School governance in the United States is established under strong principles of local control and democratic responsiveness. Public school districts, as we termed them in an earlier work, are America's *Ten Thousand Democracies* (Berkman and Plutzer 2005). Other scholars have argued that the expression of America's "democratic wish" is often projected most emphatically on the nation's public schools (Iannaccone and Lutz 1995; McDermott 1999, 13; Wong 1995, 24). The argument put forward in this chapter's epigraphs by William Jennings Bryan and Justice Antonin Scalia is a compelling one that is deeply rooted in American political culture: In a democratic system, *the people* should decide what shall be taught in publicly funded schools. And polls have consistently shown that *the people* have been and remain firmly in favor of teaching alternatives to evolution and perhaps excluding evolution from the classroom altogether (Plutzer and Berkman 2008).

It is no accident that the most visible anti-evolutionist in the early twentieth century was William Jennings Bryan. A three-time Democratic nominee for President, Bryan is perhaps best known today as the prominent and flamboyant prosecutor in the 1925 "Monkey Trial." Bryan's portrayal by two-time Oscar winner Fredric March in the Hollywood film *Inherit the Wind* has fixed in many people's minds the image of Bryan as a fundamentalist bigot. Yet, the real Bryan was a much more complex figure than his depiction on stage and screen. Although he did believe that Darwinism contradicted the biblical account of creation and that the teaching of evolution undermined

Christian faith and gave rise to atheism, he did not, like many of his supporters, endorse a literal reading of Genesis or believe in a "young earth" (Ginger 1958; Numbers 1992).

At the same time, throughout his career, Bryan was a passionate supporter of majoritarian democracy who placed considerable faith in the wisdom of the mass of ordinary citizens. As Walter Lippmann described him, Bryan

> had always argued that a majority had the right to decide. He had insisted on their right to decide war and peace, on their right to regulate morals, on their right to make and unmake laws and lawmakers and executives and judges. He had fought to extend the suffrage so that the largest possible majority might help decide; he had fought for the direct election of senators, for the initiative and referendum and direct primary, and for every other device that would permit the people to rule (Lippmann 1927, 46).

Knowing that public opinion was on his side, Bryan argued – a year before the *Scopes* trial – that taxpayers should determine whether or not to teach evolution. Indeed, the entire *Scopes* trial can be seen as a vindication of majoritarian democracy. The Butler Bill that banned the teaching of human evolution was passed by many ambivalent legislators who were understandably concerned that a vote against the bill would have electoral consequences; a less than enthusiastic Governor Austin Peay similarly felt pressured into being a supporter (Ginger 1958; Larson 1989). Judge John T. Raulston, who presided over the original *Scopes* trial, consistently made procedural rulings that favored the prosecution, and it is reasonable to infer that his conduct in the case was intended to aid his chances for re-election in the following year.[6]

This notion of popular sovereignty is a core question for political philosophers and political scientists. Democratic theorists disagree about many particulars but agree that "democracy" must involve processes that permit the results of governance to reflect (sometimes only roughly) the will of ordinary citizens. The will of citizens would, ideally, result from considerable deliberation (e.g., Barber 1984; Dryzek 1990; Habermas 1994) in an environment in which citizens have

[6] In many respects, Raulston behaved like a judge running for re-election – which he was. For example, Raulston frequently interrupted or delayed the trial to afford photo opportunities with the visiting press (Ginger 1958).

access to many sources of information and where they feel free to express their opinions, whatever these might be (Dahl 1989). Ordinary citizens would know the various policy options and have the capacity to understand the arguments made on behalf of competing proposals. Citizens would also act on behalf of the general good and avoid violating the fundamental rights of others, rather than acting only on the basis of their personal or parochial interests. And ideally, the public would have the means to communicate their views to government officials and to remain active participants in all stages of the policy-making process. We will return to some of these subtleties in Chapter 2, where we try to understand the beliefs and policy preferences of ordinary American citizens. But there can be no doubt that the majoritarian principal is a compelling one that lies at the heart of any definition of democracy.

ALTERNATIVES TO MAJORITARIAN DEMOCRACY

The participatory ideal stands in contrast to the arguments of Plato who believed that rule by benevolent *guardians* was the best form of governance. In Plato's ideal state, guardians would be interested only in the well being of the *polis*, and they would be trained in the arts of governance. In the contemporary United States, the notion of rule by guardians, philosopher kings, or any other benevolent ruler is an alien concept in principal. And yet guardianship, or what Dahl (1989) has labeled *quasi-guardianship*, occurs in a number of guises. We will consider three different forms of quasi-guardianship – each with its own argument against the majoritarian principal and each providing its own answer to who should decide what students learn.

The first argument is that the protection of civil liberties must always trump the majority. Today, state and local educational policies that infringe on freedom of speech, freedom of religion, or rights of due process will be voided by U.S. Courts even if they represent the will of the majority. Anti-evolutionism is firmly rooted in American Protestant fundamentalism and developed into a potent political force from this theological and organizational base. And alternatives to evolution, whether termed creationism, creation-science, or intelligent design, are themselves rooted in the Genesis creation story. Federal courts have therefore consistently held that laws and policies