

Rethinking *Dover*:  
The Role of Science and Education in Liberal Society

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## I. Introduction: The *Dover* Case and the Role of Education in Liberal Democracy

Although the debate over teaching evolution in public schools is not new, the discussion changed significantly with the introduction of intelligent design. Unlike creationism, intelligent design does not ground itself in any biblical tradition or reject all evolutionary change. Instead, intelligent design claims that Darwin's theory of evolution – particularly natural selection and random mutation – cannot account for the complexity and beauty of life, and, therefore, there must be an “intelligent designer” responsible for the creation of living organisms.<sup>1</sup> In 2004, a small, predominantly Christian, white, and economically modest school district in Dover, Pennsylvania passed a mandate requiring biology teachers to read a statement to their ninth graders. When the teachers refused, administrators cautioned students that Darwin's theory of evolution was a “theory” and there were gaps in the evidence.<sup>2</sup> A text was available in the school library – *Of Pandas and People* – that presented a different approach to human development: intelligent design.<sup>3</sup> The reading of the statement was challenged by eleven families on the grounds that it violated the First Amendment's ban on the establishment of religion. The U.S. District Court's ruling – that the statement *did* violate the establishment clause<sup>4</sup> – has been understood by the media, public officials, and academics as a triumph for secularism and science over religion and fundamentalism.

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<sup>1</sup> For accounts of the science behind intelligent design, see H. Allen Orr, “Devolution: Why Intelligent Design Isn't,” *The New Yorker*, May 20, 2005. See also, Philip Kitcher, *Living with Darwin: Evolution, Design, and the Future of Faith* (Oxford: Oxford University Press, 2006) and *Science, Truth, and Democracy* (Oxford: Oxford University Press, 2003).

<sup>2</sup> The teachers refused citing a Pennsylvania code of education stipulating that teachers cannot present information they believe to be false.

<sup>3</sup> The text read as follows: “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>4</sup> *Tammy Kitzmiller, et al. v. Dover Area School District, et al.*, 400 F. Supp. 2d 707 (M.D. Pa. 2005) held that the Dover district's teaching of intelligent design violated the establishment clause of the First Amendment (§3) and Article I, Section 3 of the Pennsylvania State Constitution because intelligent design cannot be disconnected from creationist – thus religious – teachings.

As part of a wider debate about religion in American life, the Dover case illustrates how some Americans see the teaching of evolution in public schools as threatening to their religious identity. Intelligent design – unlike creationism – uses the language of liberalism to its own advantage – emphasizing skepticism, attention to empirical data, the scientific method, and the toleration of minority views that may become majority views (e.g. intelligent design is the twenty-first century Galileo). Supporters of the theory of evolution – fearing the classification of intelligent design as “science” – use the courts to protect the “neutrality” of public education by linking intelligent design to religion.<sup>5</sup>

Journalists and scholars *sense* that Dover is an important case for American civic identity but the case is not just about science and religion. Dover raises fundamental questions about the role of science education in a liberal democracy because liberal political identity is inextricably tied to education. Because political theorists (and Supreme Court justices) have, generally, ignored the role of education in liberal society, cases like *Dover* can only be treated as ones of exclusion of intelligent design rather than *inclusion* of evolution. Thus, the case not only reveals the complexities of American political thought in regards to secularism and religion, it highlights a gap in liberal democratic theory and Supreme Court jurisprudence in regards to the education of individuals. This paper argues that education cultivates three constituent parts of the liberal individual: political citizenship, economic fitness, and moral autonomy. I demonstrate how education – in this case, science education – fosters the development of the individual in the theory in the theory and practice of modern liberal government. I suggest that the courts and contemporary theorists lack an effective defense of science education.

The first section uses the works of classic and contemporary liberal theorists to establish the role of education in political citizenship. The second section demonstrates how the Supreme Court emphasizes political socialization, economic fitness, and tentatively invokes moral autonomy. In the twenty-first century, teaching science shapes all three components of liberal education, yet *Dover* did not invoke the creation of liberal citizens, workers, or moral persons. The third section shows how John Dewey’s work clarifies the effect of science education on all three. Although liberals must hesitate to educate for a particular moral outlook, they must create citizens who can think, deliberate, and analyze in political, economic, and private moral life. The future of liberal education requires political theorists and courts to think critically about this model and articulate a more complex theory of liberal education.

The conclusion reflects on what this analysis means for understanding *Dover* and future debates over education and liberal democracy. Americans miss the mark if they ask the question “is it tolerable in a multi-faith society to mention intelligent design?” Instead, we need to consider what liberal citizens, workers, and moral persons need to function

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<sup>5</sup> The controversy over evolution and intelligent design reflects American uncertainty about our political origins. In the last ten years, historians and political theorists have debated the extent to which the American system was founded upon – or should be – creedal, liberal, and/or universal principles (e.g. Rogers Smith) or a deeply Protestant liberalism inextricably tied to religious and cultural practices (e.g. Samuel Huntington). Please see my forthcoming paper, “The Science of Citizenship: John Adams and the Creation of the Liberal Citizen,” Western Political Science Association, 2008.

responsibly in a democracy? *Dover* is an establishment clause case. But the wider issues are those of political theory. What do citizens need? What do moral persons need? Where can individuals and groups expect to get the foundation for citizenship, economic capacity, or moral personhood?

## II. Political Citizenship: Knowledge, Deliberation, and Expression

*John Adams: Knowledge, Tyranny, and the Poor*

In his *Dissertation on the Feudal and Canon Law*, John Adams insists that learning and knowledge are the foundation of political citizenship. Education creates the knowledge that allows the people – especially the poor – to “frame and support” opposition to tyrannical government: the collective ability to prevent tyranny. Education gives the “common people” the ability to understand their rights – even if those rights are God-given or innate – and successfully reject mistreatment by those in power. Adams links education to the exercise of specific rights (speech and press) as well as a general “freedom of thinking.”<sup>6</sup> The exercise of rights is literal: knowledge leads people to act and be courageous while ignorance leaves them timid and stupid. Education prevents tyranny by helping the people both understand and exercise their rights.

While ignorance produces “cruel tyranny,”<sup>7</sup> education creates knowledgeable citizens who prevent oppressive government. Adams does not speak to the effects of education on the individual. Instead, the education of the individual benefits the entire society because progress towards free government is accompanied by a change in the understanding of “the people.”<sup>8</sup>

Adams acknowledges that the sheer cruelty of arbitrary government propels the people to seek independence and confine the “power of the great within the limits of equity and reason.”<sup>9</sup> But Adams believes that the people need more than the *experience* of cruel government or elite dominance to successfully rebel. Although Adams consistently maintains that rights are God-given and cannot be repealed by human laws, the people benefit from education that explains the function of rights.

In order to effectively oppose tyranny, the people need education in “arts and letters” and the leisure to pursue it. Attending to the role of class, Adams comfortably addresses the differences between the “great” and the “meanest ranks” of the people. Assuming constant class tension, Adams explicitly seeks to empower the poor to be more vigilant citizens through education.<sup>10</sup>

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<sup>6</sup> John Adams, *Dissertation on the Feudal and Canon Law* 1765, ¶15.

<sup>7</sup> Adams, ¶1.

<sup>8</sup> Adams, ¶2.

<sup>9</sup> Adams, ¶2. Compare to John Locke, *Second Treatise*, §225: “long train of abuses” which would “rouze” people to rebellion against a monarch.

<sup>10</sup> When Brennan and Marshall address education for immigrant groups, they are far less comfortable addressing issues of class. Instead, they focus on the exclusion of minority groups.

The poor people, it is true, have been much less successful than the great. They have seldom found either leisure or opportunity to form a union and exert their strength; ignorant as they were of arts and letters, *they have seldom been able to frame and support a regular opposition.*<sup>11</sup>

Because the “great” understand this dynamic, they keep the “knowledge of their rights and wrongs, and the power to assert the former or redress the latter” from the people.<sup>12</sup> Education not only lessens the power of oppressive and arbitrary government, it empowers the poor to limit the power of elites.

Adams focuses on the need to diffuse knowledge “generally through the whole body of the people” and especially the “common people” or the “lowest ranks.”<sup>13</sup> Adams slides between “the poor” and “the people” but he insists that the education of the “lowest ranks” is of more importance *to the public* than the property owned by the rich.<sup>14</sup> The education of “the people” can be, therefore, justly secured by public expense.<sup>15</sup>

The function of education is *not* individual self-realization or equity for the poor. Instead, widespread education benefits the public and the “country’s welfare.”<sup>16</sup> Education helps forge a collective national identity of rights-bearing, tyranny-preventing, elite-limiting liberal citizens.

Adams conceives of citizenship in a disconcerting mix of religious stereotyping and egalitarianism; education trains the mind toward liberal principles but the principles and education are attributed to a particular sect of Christianity. Like many of his contemporaries, Adams writes with simplistic certainty about the tyrannical perils of Catholicism and the liberal assets of Puritan Protestantism.<sup>17</sup> For Adams, the American Puritans resemble the first Protestant reformers in England. Intelligent and learned, the English Puritans were “better read than even the members of the church.”<sup>18</sup> The American Puritans prevented the two systems of tyranny – feudal and canon – by educating the “whole body of the people.”<sup>19</sup> According to Adams, they radically supported universal public education by requiring that all towns have grammar schools “[s]o that the education of all ranks of people was made the care and expense of the public, in a manner that I believe has been unknown to any other people ancient or modern.”<sup>20</sup>

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<sup>11</sup> Adams, ¶3, emphasis added.

<sup>12</sup> Adams, ¶3.

<sup>13</sup> Adams, ¶14 and 15.

<sup>14</sup> Aristotle insists that the poor, collectively, have more property than the rich (*The Politics*, 1282b) but Adams claim is more radical. The education of the poor is more valuable to the common good than the property of the rich.

<sup>15</sup> Adams, ¶15, emphasis added.

<sup>16</sup> Adams, ¶28.

<sup>17</sup> For a brief overview of the exclusion of Catholics in American liberal thinking, see Rogers Smith, *Civic Ideals*, pp-54-58 and pp. 72-74. [Add other sources and extensive footnote on exclusion of Catholics in colonial America].

<sup>18</sup> Adams, ¶10.

<sup>19</sup> Adams, ¶14.

<sup>20</sup> Adams, ¶14, emphasis added.

Adams admits that there are Americans who resent providing universal education as “an imposition upon the rich in favor of the poor, and as an institution productive of idleness and vain speculation among the people, whose time and attention, it is said, ought to be devoted to labor, and not to public affairs, or to examination into the conduct of their superiors.”<sup>21</sup> Nevertheless, he insists that the education of the poor supports *common* liberal goals, like preventing tyranny.

Adams’ vision of the colonies is – anachronistically – Tocquevillian. Like Tocqueville, Adams maintains that there is less class differentiation and a better educated populace in America. Rogers Smith has noted that this relative equality was true of only a minority of Americans: white, propertied, and male.<sup>22</sup> Smith’s criticism of Tocqueville is equally valid for Adams and Adams’ claims are clearly exaggerated. Although Massachusetts was the first colony to pass legislation to create local schools, in 1642, there was resistance in many towns. There was no formal, tax-supported, state-funded system of schools until the 1840s and, even then, the schools served barely fifty percent of the population.<sup>23</sup> Moreover, Adams was not entirely committed to universal citizenship.<sup>24</sup>

Although Adams focuses primarily on the education of the “people” and the poor, he believes elite “men of learning” helped prevent tyranny during the reigns of James I and Charles I. For Adams, the American Puritans complemented their universal elementary education by creating a college-educated elite. Adams recognizes that “the people” will not all use these colleges; the poor often contribute to an institution primarily used by the rich.<sup>25</sup> Attentive to class dynamics, Adams celebrates the Puritans’ *simultaneous* focus on the need to educate widely – through universal elementary education – and selectively – though colleges and seminaries.

Although Adams focuses on the general impact of learning and knowledge on the citizenry, he also addresses the effects of education on particular rights: press and freedom of speech. As we will see below, Justice Marshall will also tie public education to particular constitutional rights.

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<sup>21</sup> Adams, ¶15.

<sup>22</sup> Rogers Smith notes that the rough equality among that group was juxtaposed with assumed inequalities between men and women, northern Europeans and Africans or Native Americans, gays and heterosexuals, and Protestants and Catholics, Jews, or Muslims. Rogers M. Smith, *Civic Ideals*, (New Haven: Yale University Press 1997), p. 17.

<sup>23</sup> See Bernard Bailyn, *Education in the Forming of American Society: Needs and Opportunities for Study*, (Chapel Hill: University of California Press, 1960). See also Lawrence A. Cremin, *American Education: The Colonial Experience 1607-1783*, (New York: Harper 1970) and Carl F. Kaestle *Pillars of the Republic: Common Schools and American Society, 1780-1860* (New York: Hill and Wang, 1983). Thanks to Michael Clapper for clarifying the history of public schools in New England.

<sup>24</sup> For example, Adams seems to have rejected the notion that all people who *lived* in the colonies and were subject to British rule were British subjects: “When James Otis instead asserted, consistent with Coke, that all ‘colonists, black and white’ born here, are free born British subjects,’ John Adams was one of many who “shuddered.” See Smith, *Civic Ideals*, p. 73.

<sup>25</sup> Adams, ¶ 14.

Adams sees a free press as crucial to the knowledge of citizens and the control of the powerful. As educated individuals express their personal criticisms of government, the vices of great men are revealed: the press publishes the “speculations of the curious” and preserves the “freedom of thinking, speaking, and writing.” The press honors and serves the country as it protects the “public, liberty, and happiness” from the “ambition and avarice” of great men by publishing *and* fostering criticism.<sup>26</sup> Once again, education will control government and elites. Adams consistently links freedom of the press to freedom of thinking and speaking. Rather than emphasizing individual liberty, Adams focuses on the *collective* effect of these rights; they serve the “country.”

Throughout the *Dissertation*, Adams insists that the spirit of liberty is important but without knowledge, it would be nothing but a “brutal rage.”<sup>27</sup> A nation founded on liberal principles requires a populace that is knowledgeable about principles *and* history – particularly the history of rebellions based on rights and the establishment of the American colonies.<sup>28</sup> In order to create an informed populace that insures liberal government, Adams advocates educational institutions, exercise of rights, and a knowledge of the past such that: “...every sluice of knowledge be opened and set a-flowing.”<sup>29</sup>

Adams does not emphasize the role of rights in the private life of the individual. Instead, rights embolden citizens to collectively protect liberal government and oppose tyranny. Education allows “the people” – particularly the poorer people – to understand and exercise their rights. For Adams, knowledge creates a people capable of political freedom. Adams asks a lot of citizens – but he insists that governments should provide the institutions necessary to create citizens capable of such a weighty responsibility: public schools.

#### *Deliberation as Central to Citizenship: Gutmann, Creationism, and Oppression*

After 222 years of public school evolution, Amy Gutmann returns to some of the issues of liberal education and citizenship.<sup>30</sup> Unlike Adams, Gutmann writes in the context of a highly developed national education system – but one in which states and localities still exercise control over school organization, curriculum, and process. Gutmann clarifies two issues at stake in liberal education: democratic input in education decisions and the limits on democratic decision-making in a pluralistic society.

Gutmann connects democratic citizenship and education through deliberation and she excludes creationism as a religious creed that threatens the quality of citizens. Yet, she fails to supply positive criteria for including the teaching of the theory of evolution or any science in the curriculum. Intelligent design was not a force in the late 1980s or 1990s

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<sup>26</sup> Adams, ¶15. *Check if this is my emphasis.*

<sup>27</sup> Adams, ¶24.

<sup>28</sup> Adams, ¶24.

<sup>29</sup> Adams, ¶28.

<sup>30</sup> Amy Gutmann, *Democratic Education* (Princeton: Princeton University Press, 1987). The book was revised and reissued in 1999. All quotations are from the 1999 version.

but her analysis helps explain why intelligent design has presented itself as a minority view with the right to be represented in public school curriculum.

Gutmann argues that the primary goal of democratic education should be to “cultivate the skills and virtues of deliberation” because deliberation is at the core of democratic citizenship.<sup>31</sup> Not only should the *substance* of education be directed at the needs of a democratic polity, the *process* of making decisions should be democratic. Majorities should have a substantial role in making educational decisions for the training of democratic citizens in their communities. Gutmann favors decisions that are local, democratic, and deliberative – and all three are linked in her analysis.

Despite her support for democratic decisions, Gutmann does not presume that democratic deliberation will always produce desirable results. Majorities can be “undemocratic” because educational policies can directly or indirectly “stifle the capacity and even the desire for deliberation” in individuals.<sup>32</sup> Some states try to “protect contestable political perspectives against intellectual challenge.”<sup>33</sup> Given the potential for oppression, Gutmann places restrictions on the local majority’s educational authority: “A society is undemocratic – it cannot engage in conscious social reproduction– if it restricts rational deliberation or excludes some educable citizens from an adequate education.”<sup>34</sup> A commitment to “nonrepression” and “nondiscrimination” prevents “states, and any group within them, from restricting rational deliberation of competing conceptions of the good life and good society.”<sup>35</sup> Gutmann would, therefore, prevent a local community from maintaining a racist or segregationist ideology in classroom teaching or textbooks. Although we might agree in the case of these particular examples, her terms are extremely vague. How can we define “contestable political perspectives,” “rational deliberation” or “adequate education”? In more controversial cases – like intelligent decision – these terms will not settle the case. Moreover, proponents of intelligent design have turned arguments concerning “competing conceptions” to their advantage claiming that they are an oppressed minority that seeks an increase in deliberation and discussion.

At first glance, Gutmann’s criteria for democratic education *support* the teaching of intelligent design in public schools. In the Dover, Pennsylvania case, the process was local, democratic, and deliberative. Local citizens elected the school board that created the policy that mandated the reading of the statement to children and the supply of an intelligent design text to the school library. Citizens could, and did, attend open meetings before the policy was enacted. The Dover statement was designed to increase deliberation by challenging students to reflect upon competing theories and decide for themselves. In her discussion of textbook selection, Gutmann maintains that: “...we would judge various methods of textbook selection, first, by their openness to citizen participation, and second, by their potential to open citizens to the merits of unpopular

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<sup>31</sup> *Democratic Education*, p. xiii.

<sup>32</sup> *Ibid.* p. 96.

<sup>33</sup> *Ibid.* p. 100.

<sup>34</sup> *Ibid.* p. 95. Gutmann assumes social reproduction is a legitimate – and crucial – element of democracy.

<sup>35</sup> *Ibid.* p. 98.

points of view.”<sup>36</sup> In *Dover*, a democratically elected school board supplied supplemental resources on ID after holding public meetings and ID is clearly controversial and “unpopular.”

Gutmann wrote before the intelligent design movement took hold in American schools but we can learn something from her treatment of creationism. Gutmann rejects the teaching of creationism as “indirect repression” because “the broader implications of the policy rather than the policy itself are repressive.”<sup>37</sup> Even a democratic decision to teach creationism must be rejected because 1) theories should be selected by professionals not majorities; 2) religious pluralism requires the exclusion of teaching a Christian theory of creation; and 3) there exists an American consensus to accept secular standards of reason and the scientific case against creationism is straightforward. All three criteria pose problems for excluding the mention of intelligent design from school curricula.

First, Gutmann’s analysis raises the issue of who decides on curriculum content but leaves many questions unanswered. What constitutes a “professional” decision.<sup>38</sup> Do school boards count as professionals? What about professional organizations within disciplines? National, state, or local authorities? She distinguishes between state of the art information and religious indoctrination; exclusion of material from a public education curriculum is *not* based on solid evidence and reason alone.<sup>39</sup> If we demanded a curriculum based on professional standards of history, we would need more balance in the treatment of the American Revolution instead of one sympathetic to Americans. But Gutmann claims that creationism is different from the American Revolution because creationism is “believable only on the basis of a sectarian religious faith.” If we teach creationism as science, we indirectly violate the principle of nonrepression because we impose “a sectarian religious view on all children in the guise of science.”<sup>40</sup> If we teach the American Revolution in a biased way, we deprive students of full knowledge of events and reinforce national myths but we do not impose a religious position. Gutmann admits that majorities might not teach the “best” history – but they cannot impose a particular religious view.

Second, Gutmann suggests creationism cannot be taught in a pluralistic religious context. In a hypothetical society with homogenous beliefs, “teaching creationism might be compatible with *their* democratic standards” because “we do not share a similar religious conviction against accepting the methods and results of scientific reasoning.”<sup>41</sup> Here, Gutmann side-steps two important problems. First, there is no such thing as a religiously

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<sup>36</sup> Ibid. p. 101.

<sup>37</sup> Ibid.

<sup>38</sup> Ibid., emphasis added.

<sup>39</sup> Gutmann rejects teaching “truth” at the expense of democratic process. Liberals, like Kant, believe that “enlightened experts” should make decisions about what should be taught (Ibid. p. 11). Gutmann emphasizes collective deliberation rather than liberal goals but she repeatedly returns to liberal limitations on the power of local majorities. She wants citizens empowered but comfortably excludes racist beliefs (Ibid. 14). Gutmann emphasizes the process of deliberating as the ultimate goals but she also assumes substantive goals – e.g. political equality – even if she is uncomfortable calling them liberal.

<sup>40</sup> Ibid. p. 103.

<sup>41</sup> Ibid. p. 102.

homogenous society because within religious groups there are always doctrinal (and other) differences. Even if there was a community that was generally homogenous, it would be equally important – if we believe deliberation is essential to democratic citizenship – to teach a variety of views rather than solidifying the majority’s understanding of any important issue. Second, creationism is an easy case because creationists openly declare that their source of belief is (generally) Christian religion. But intelligent design carefully avoids attachment to any particular religion’s view of human origins. ID uses the work of credentialed academics to bolster their claims. Although these scholars are outliers in their respective fields, intelligent design presents itself as neutral to religion and non-reliant on any particular biblical text.<sup>42</sup> If religious pluralism denies access to public schools, “scientific” pluralism seems to guarantee ID a hearing.

Yet Gutmann limits the contestable perspectives that must be given voice to the “political.” Teachers might discuss the creationist movement or ID in a social studies class as a development in American political culture. Students could learn the two conflicting views without presenting creationism as science. But schools could not teach either in the context of a biology class as an alternative to evolution.

Third, Gutmann overstates the American consensus on science as the standard for accepted theories – or American intellectual culture has changed dramatically in the last twenty years. For Gutmann, creationism can be rejected because we believe we live in a religiously diverse society that accepts the “secular standards of reasoning.” In addition, the “scientific case against creationism is straightforward” and “our ability to agree upon a body of knowledge worthy of transmitting to future generations depends in significant measure upon widespread acceptance of scientific standards of evidence and verification.”<sup>43</sup> Gutmann treats this position as the consensus in the United States: “Most Americans have reconciled the tenets of their faith with the findings of science.”<sup>44</sup> But she acknowledges that citizens of pluralistic democracies do not agree that science should trump religious faith. Thus, the exclusion of creationism is more complicated. Citizens differ in their religious beliefs – especially in the United States – and this is truer today than when Gutmann wrote in 1987. The week that *Dover* was being heard in federal court, 40%-50% of Americans reported that they accepted the biblical creationist account of the origins of life. Roughly the same percentage of Americans reported that they believed that humans evolved over time.<sup>45</sup> We have “widespread acceptance” of *both* science and religion as a standard.<sup>46</sup>

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<sup>42</sup> For example, Michael J. Behe, a professor of biological sciences at Lehigh University presents arguments about cell complexity from biochemistry while William A. Dembski, a professor in the conceptual foundations of science at Baylor University provides the mathematical claims. Dembski has a Ph.D. in *both* mathematics and philosophy and a master of divinity in theology. Though it is hard to imagine people who qualify more as experts, both are outliers in their respective fields. See H. Allen Orr, “Devolution: Why Intelligent Design Isn’t,” *The New Yorker*, May 30, 2005.

<sup>43</sup> *Democratic Education*, p. 102

<sup>44</sup> *Ibid.* p. 103.

<sup>45</sup> The Pew Research Center For The People & The Press, September 28, 2005. The Gallup poll numbers are slightly different finding 45% believing in a creationist position, 13% believing in natural selection, and 38% believing that God guided the evolutionary process.

<sup>46</sup> The Pew and Gallup data does not allow us to know whether people distinguish their personal belief in creationism from what they believe should be taught in the public schools.

Even if we favor a secular approach in the schools, we cannot argue that secularism is neutral to all religious beliefs. It clearly is not. Instead, Gutmann insists that “secular standards constitute a *better* basis upon which to build a common education for citizenship than any set of sectarian beliefs – better because secular standards are both a fairer and firmer basis for peacefully reconciling our differences.”<sup>47</sup>

The proponents of intelligent design exploit Gutmann’s distinction. After the Supreme Court excluded the teaching of creationism as a violation of the establishment clause in *Edwards v. Aguillard*,<sup>48</sup> *Of Pandas and People* was reworked to remove the term creationism (associated with biblical literalism) and focus on supposed inconsistencies in Darwin’s theory of evolution based on supporting “scientific” data. In *Dover*, Judge Jones insists that these changes were strategic: intelligent design is a *religious* account that has been repackaged in the language of science. He rejects ID, in part, because the *intent* of ID’s supporters is to promote Christian religion.

Even if Judge Jones can demonstrate that ID is repackaged creationism, should the *content* of ID should be taken at face value or should the *intent* of the advocates be judged? ID *is* the product of an extensive, well-organized, and well-funded campaign to challenge the legitimacy of Darwinian evolutionary theory.<sup>49</sup> ID clearly fails to provide an alternative scientific theory of the origin of species. But if it successfully identifies any weaknesses in evolutionary theory, could it be taught even if the *motivations* of its creators are religious? If we believe in Mill’s marketplace of ideas, we might want criticism of important political, economic, social, and scientific principles – regardless of their source.

While this is tempting, much rides on the position of ID: is it a scientific theory taught in a science class or a social movement covered in social studies? If evolution *is* taught as “best science” and ID is taught in social studies as a social belief, ID could criticize evolution. If evolution and ID are both taught as science, evolution’s status is reduced to “just” one of many theories. This is precisely the hope of the supporters of ID. Evolution is a secular scientific *theory* contradicting a religious scientific theory. All are equal – and should be presented as such in public schools.

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One of Gutmann’s primary aims in *Democratic Education* is to be clear and explicit about the ends of education. Before we can talk about what is a “better” education, we must understand exactly what we are trying to accomplish in the schools. Democracies are not “bound to teach the truth” but they are required “*not* to teach false doctrines that

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<sup>47</sup> *Democratic Education*, p. 103. Emphasis added. Recent First Amendment scholarship has moved toward seeing a secular standard as prejudicial to religious views.

<sup>48</sup> 482 U.S. 578 (1986). Justices Brennan, Marshall, Blackmun, Powell, and Stevens signed the majority opinion. Justices Burger, White, Rehnquist, and O’Connor dissented. Given changes in personnel and evolving standards on religion and schools, it is unclear that this 1986 precedent will survive challenge – yet this is the interpretation of the establishment clause upon which *Dover* rests.

<sup>49</sup> H. Allen Orr, “Devolution: Why Intelligent Design Isn’t,” *The New Yorker*, May 20, 2005.

threaten to undermine the future prospects of a common democratic education.”<sup>50</sup> Gutmann sees the establishment clause of the Constitution as a statement of nonrepression: “The rationale for teaching any particular religious doctrine in public schools – either as science or as a reasonable alternative to science – conflicts with the rationale for cultivating common, secular standards of reasoning among citizens.”<sup>51</sup> Schools can’t teach creationism as science because this negates science defined as “secular standards of inquiry and knowledge.” Schools can’t teach creationism as an alternative to science because we would be required to give equal time to *all* religious doctrines of creation, not just Christian ones.

What is really at stake for Gutmann is the thwarting of “the development of shared intellectual standards among citizens” and the discrediting of public schools “in the eyes of citizens whose religious beliefs are not reflected in the established curriculum.”<sup>52</sup> Ultimately, Gutmann wants students (as future citizens) to think critically and to develop the ability to reason about complex issues. Although she concedes that this is not easy to test for or even write a curriculum for, the ability to “reason collectively and critically about politics” is the crucial goal.

Gutmann is right that political theory can help educators, citizens, policy-makers, and judges clarify what the goals of education should be. Yet Gutmann can only exclude creationism as an inappropriate establishment of religion. Gutmann would *include* evolution because she assumes there is an American consensus that our educational standards should be grounded in common, secular standards of reasoning. Gutmann cites our agreement about secular standards – but she does not elaborate *how* science – as opposed to other subjects taught in public schools – make citizens more deliberate or more capable of discussing complex issues.

### **III. The Supreme Court: Education for Political and Economic Socialization**

Although the *Dover* case focused exclusively on the first amendment’s establishment clause, state and federal courts have ruled on more general requirements of public education. The U.S. Supreme court, for example, has emphasized education as providing the proper socialization for American citizens – or potential citizens. Although the Court does not emphasize democratic deliberation or science education, the Court clearly holds that education is the foundation for the political and economic life of the individual. Like John Adams, the Court highlights the positive effect education has on the public good.

The jurisprudence of the Court on education is limited by the text of the Constitution, which does not explicitly link education to the maintenance (or flourishing) of liberal government. The Constitution does not mention educational goals or institutions. There are complicated reasons for these omissions – including the federal system, the provision

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<sup>50</sup> *Democratic Education*, p. 103.

<sup>51</sup> *Ibid.* pp. 102-103.

<sup>52</sup> *Ibid.* p. 104.

of educational goals and institutions in the colonial constitutions, and the later development of the public education system.<sup>53</sup>

In the case of teaching evolution, the Constitution also provides little help – mentioning science only once. Article I, section 8, clause 8 gives the Congress the power to “promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries[.]” Neither the notes from the Constitutional Convention nor Supreme Court jurisprudence shed much light on the meaning of clause 8. Although we might understand this language as a call for the promotion of science, the Court has understood the clause to protect patents and ideas. During the Constitutional Convention, delegates unsuccessfully suggested language that would have encouraged teaching of science in universities or other explicit supports of science.<sup>54</sup>

Although the Constitution does not connect science, education, and citizenship, the Supreme Court has held that groups of individuals or citizens cannot be left out of state public education systems. The Court has insisted that education is linked to political and economic capacities that are essential to a functioning, flourishing, and stable liberal nation. Education creates a socially, economically, and politically responsible citizenry.<sup>55</sup>

#### *Justice Brennan: Education, Public Responsibility, and Stability*

In *Plyler v. Doe*, the Supreme Court held that the state of Texas could not deny free public education to children of illegal aliens under the Equal Protection clause of the Fourteenth Amendment.<sup>56</sup> Writing for the majority, Justice William Brennan establishes

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<sup>53</sup> It is beyond the scope of this paper to carefully consider the justification and institutional development of public schools in the United States. Nevertheless, public schools were *not* created by the national government and the constitution is silent on educational goals or institutions. Over a 150 year period, localities and states created schools with varying goals for students. In the United States, one cannot easily address *the state's* educational policy. Instead, one must look to the *states'* policy and the extent to which the Supreme Court rejects state policy as inconsistent with amendments not specifically addressed to education. See Bernard Bailyn, *Education in the Forming of American Society: Needs and Opportunities for Study*, (Chapel Hill: University of California Press, 1960); Lawrence A. Cremin, *American Education: The Colonial Experience 1607-1783*, (New York: Harper 1970); Carl F. Kaestle *Pillars of the Republican: Common Schools and American Society, 1780-1860* (New York: Hill and Wang, 1983); and William J. Reese, *America's Public Schools: From the Common School to "No Child Left Behind,"* Baltimore: Johns Hopkins University Press, 2005.

<sup>54</sup> See *Farrand*, 2:321; *Journal*, 18 Aug, 2:505; *Journal*, 5 Sept.; and 2:595; *Committee of Style. The Founders Constitution*, edited by Ralph Lerner and Philip Kurland.

<sup>55</sup> For an account of how the Court has established *positive* rights to education and how these cases might affect the teaching of evolution, please see my work in progress, “The Forcing of Democratic Education: Citizenship and the Courts.” The Supreme Court links education and citizenship in its jurisprudence of immigrant education and other school district cases (e.g. *Plyler v. Doe* (1982); *Meyer v. Nebraska* (1923); *Abington School District v. Schempp* (1963), *Wisconsin v. Yoder* (1972), *San Antonio Independent School District v. Rodriguez* (1973), and *Ambach v. Norwick* (1979)).

<sup>56</sup> *Plyler v. Doe*, 457 U.S. 202 (1982) was a 5-4 decisions with Justices Brennan, Marshall, Blackmun, Powell, and Stevens in the majority. Justices Burger, White, Rehnquist, and O'Connor dissented. The children are “persons” and cannot be discriminated against unless a substantial state interest can be demonstrated.

that public education is more than a governmental “benefit” but not quite a right. Brennan reestablishes that the “acquisition of knowledge” is of “supreme importance” to the American people.<sup>57</sup> Brennan justifies the importance of education on two grounds: the impact on basic American institutions (liberal citizenship) and the impact on the child (liberal autonomy). Although he addresses both, he emphasizes the role of institutions, leaving the impact on the child less carefully defined and developed.

Brennan insists that public schools are the “most vital civic institution for the preservation of a democratic system of government.”<sup>58</sup> Citing *Brown v. Board*, Brennan claims that public education supports democracy as the source of the performance of the “most basic public responsibilities” including military service.<sup>59</sup> Education transmits and reproduces the “shared values through which social order and stability are maintained.”<sup>60</sup> Education prepares children to preserve “freedom and independence” by participating “effectively and intelligently” in an “open” political system.<sup>61</sup> Public schools inculcate fundamental values “necessary to the maintenance of a democratic political system.”<sup>62</sup> In sum, the education of the individual enhances the public good.

Brennan sees economic benefits as well. Educated students compete more effectively in the economic marketplace – helping both the individual and the public. Education prepares a child for “professional training” that allows the child to “succeed in life” and be economically productive.<sup>63</sup> Education also prepares *individuals* to be “self-reliant and self-sufficient participants in society.” Here, Brennan comes close to some idea of autonomy through the idea of individual achievement:

The inability to read and write will handicap the individual deprived of a basic education each and every day of his life. The inestimable toll of that deprivation on the *social, economic, intellectual, and psychological well-being of the individual*, and the obstacle it poses to individual achievement, make it most difficult to reconcile the cost or the principle of a status-based denial of basic education with the framework of equality embodied in the Equal Protection Clause.<sup>64</sup>

Brennan sees education as a way of “awakening”<sup>65</sup> the child to civic values.

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<sup>57</sup> *Plyler v. Doe*, 457 U.S. 202, 221 quoting *Meyer v. Nebraska*, 262 U.S. 390, 400 (1923).

<sup>58</sup> *Abington School District v. Schempp*, 374 U.S. 203, 230 (1963) (BRENNAN, J., concurring). Education has a “fundamental role in maintaining the fabric of our society.” *Plyler v. Doe*, 457 U.S. 202, 221.

<sup>59</sup> *Plyler v. Doe*, 457 U.S. 202, 223 quoting *Brown v. Board of Education*, 347 U.S. 483 (1954), 493.

<sup>60</sup> *Plyler v. Doe*, 457 U.S. 202, Footnote #20.

<sup>61</sup> *Wisconsin v. Yoder*, 406 U.S. 205, 221 (1972).

<sup>62</sup> *Ambach v. Norwick*, 441 U.S. 68, 77 (1979).

<sup>63</sup> *Plyler v. Doe*, 457 U.S. 202, 224 quoting *Brown v. Board*, 347 U.S. 483, 493; *Plyler v. Doe*, 457 U.S. 202, 221.

<sup>64</sup> *Plyler v. Doe*, 457 U.S. 202, 222, emphasis added.

<sup>65</sup> *Plyler v. Doe*, 457 U.S. 202, 223 quoting *Brown v. Board of Education*, 347 U.S. 483 (1954), 493.

*Brown* emphasizes the awakening of the child to cultural values while Kant imagines an awakening that might lead to self-reflection and/or analysis: tools necessary for the challenging of dominant culture or criticizing the state.

Yet Brennan quickly returns to individual success as a *means* to another end: the benefit of society. Brennan insists that depriving individuals of opportunity stops them from contributing to the “progress of our Nation.”<sup>66</sup>

In sum, education has a fundamental role in maintaining the fabric of our society. We cannot ignore the significant social costs borne by our Nation when select groups are denied the means to absorb the values and skills upon which our social order rests.<sup>67</sup>

Brennan balances two ideas: persons have a right to succeed in a meritocratic system and individual success will benefit the entire society. He emphasizes the need of the “disfavored groups” to not only succeed economically – but for that success to be recognized by the majority: “Paradoxically, by depriving the children of any disfavored group of an education, we foreclose the means by which that group might raise the level of esteem in which it is held by the majority.”<sup>68</sup> It is unclear whether Brennan means to emphasize fairness or (group) self-esteem.

Brennan does not emphasize education’s role in increasing independence for the individual student. Given the political context, this is understandable. Brennan favors education for a group (illegal immigrants) resented by a majority of Texans (and Americans). Brennan emphasizes the effect of uneducated children on the nation. Politically, they must be socialized and trained to be future citizens. Economically, they must have tools for success.

Despite Brennan’s support for education as the foundation of democratic government, the *substance* of what makes for a good citizen – the content and methods of public education – is left to the individual state. In *Brown*, Chief Justice Warren rejects a method – segregation of children by race – as invalid. By contrast, Brennan forbids the exclusion of a group from education by the state but he does not insist on any particular curriculum or teaching method that would achieve his goals of socialization and training for citizenship.

### *Marshall: Education as the Foundation of Rights*

Justice Thurgood Marshall’s concurrence in *Plyler* (based on his dissent in *San Antonio Independent School District v. Rodriguez*) is more complex and radical than Brennan’s majority opinion.<sup>69</sup> It is highly unlikely that even a plurality of the Roberts’ Court would support Marshall’s claim that education is a fundamental right.

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<sup>66</sup> *Plyler v. Doe*, 457 U.S. 202, 224. Note the use of “them” and “they.” The children are considered outsiders because they are not citizens.

<sup>67</sup> *Plyler v. Doe*, 457 U.S. 202, 221.

<sup>68</sup> *Plyler v. Doe*, 457 U.S. 202, 222.

<sup>69</sup> *Plyler v. Doe*, Marshall concurring; *San Antonio Independent School District v. Rodriguez*, Marshall dissenting, 411 U.S. 1, 99-105.

Marshall begins by establishing that education has been a “special concern” of the Supreme Court and the “the very foundation of good citizenship.”<sup>70</sup> Like Brennan, he links education and political processes and maintains that education is the “dominant factor affecting political consciousness and participation.”<sup>71</sup> Education helps children “reach their full potential as citizens.”<sup>72</sup> Education is vital for preserving a democratic system of government and instilling appreciation for principles and operation of political processes.<sup>73</sup>

Unlike Brennan, Marshall contends that there is a “close relationship between education and some of our most basic constitutional values.”<sup>74</sup> Education directly affects the individual’s ability to exercise *particular* political functions: free speech and free association (first amendment) and the right to vote (Article I, 2 and the Seventeenth Amendment). In addition, Marshall emphasizes the autonomy of the individual.

In his discussion of the First Amendment, Marshall appeals to elements of the liberal citizen and the autonomous person. Education enhances the ability of citizens to speak openly, voice new ideas, and criticize the government. Like Adams, Marshall argues that education creates articulate citizen critics who force the government to justify their actions more clearly.<sup>75</sup> But there is a second element to free speech: the ability of the individual to build capacities for personal growth. In this case, the First Amendment’s protection of speech and association helps individuals enjoy their rights – express themselves – as individuals. The focus is *not* exclusively political.

Building on the ideas of J.S. Mill – emphasized by Justice Holmes in *Schenck*<sup>76</sup> – Marshall sees the classroom as a marketplace of ideas. Education provides the tools for and “may instill the interest” in “political discourse and debate.” “[i]ndeed, it has frequently been suggested that education is the dominant factor affecting political consciousness and participation.”<sup>77</sup> A system of “[c]ompetition in *ideas and governmental policies* is at the core of our electoral process and of the First Amendment freedoms.”<sup>78</sup> For Marshall, the rights of individuals – specifically, free speech and association – support democratic discourse and debate on public policy.

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<sup>70</sup> *San Antonio Independent School District v. Rodriguez*, 411 U.S. 1, 110; Marshall quoting, *Brown v. Board of Education*, 347 U.S., at 493. Marshall cites the same passage as Brennan.

<sup>71</sup> *San Antonio Independent School District v. Rodriguez*, 411 U.S. 1, 113

<sup>72</sup> 411 U.S. 1, 71.

<sup>73</sup> 411 U.S. 1, 113: “Americans regard the public schools as a most vital civic institution for the preservation of a democratic system of government.” *Abington School Dist. v. Schempp*, 374 U.S. 203, 230 (1963) (BRENNAN, J., concurring). Education serves the essential function of instilling in our young an understanding of and appreciation for the principles and operation of our governmental processes.

<sup>74</sup> 411 U.S. 1, 111 This is repeated in his concurrence in *Plyler*: “an individual’s interest in education is fundamental, and that this view is amply supported by the unique status accorded public education by our society, and by the close relationship between education and some of our most basic constitutional values.”

<sup>75</sup> Unlike Adams, Marshall does *not* focus on freedom of the press but speech and association.

<sup>76</sup> *Schenck v. United States*, 249 U.S. 47 (1919).

<sup>77</sup> 411 U.S. 1, 113.

<sup>78</sup> 411 U.S. 1, 114, quoting *Williams v. Rhodes*, 393 U.S. 23, 32 (1968). Emphasis added. Marshall contends that “the political process, like most other aspects of social intercourse, is to some degree competitive” in 411 U.S. 1, Footnote 72.

Even if the rights of individuals benefit the public, they also benefit individuals. Students inquire, study, and evaluate, “to gain new maturity and understanding.”

Education directly affects the ability of a child to exercise his First Amendment rights, both as a source and as a receiver of information and ideas, whatever interests he may pursue in life. This Court's decision in *Sweezy v. New Hampshire*, 354 U.S. 234, 250 (1957), speaks of the right of students “to inquire, to study and to evaluate, to gain new maturity and understanding . . . .” Thus, we have not casually described the classroom as the “marketplace of ideas.” *Keyishian v. Board of Regents*, 385 U.S. 589, 603 (1967). The opportunity for formal education may not necessarily be the essential determinant of an individual's ability to enjoy throughout his life the rights of free speech and association guaranteed to him by the First Amendment. But such an opportunity may *enhance the individual's enjoyment of those rights*, not only during but also following school attendance. Thus, in the final analysis, “the pivotal position of education to success in American society and its essential role in opening up to the individual the central experiences of our culture lend it an importance that is undeniable.”<sup>79</sup>

Elsewhere, he highlights the need for the individual to be “self-reliant and self-sufficient participants *in society*.”<sup>80</sup>

Marshall seems to believe that education creates citizens who are politically capable and economically self-reliant but education also encourages a challenging of cultural values and inherited traditions. Citizens who reflect critically enhance both democracy and their own autonomy.

Yet Marshall does not rely on Justice Douglass' dissent in *Yoder*. Douglass emphasizes the loss of autonomy of the individual child. Without education, the “the child will be forever barred from entry into the new and amazing world of diversity that we have today.” The “future of the student’ and his ability to rebel against the religious beliefs of his parents is at stake. If the child is only exposed to the beliefs of the Amish “his education is truncated, his entire life may be stunted and deformed.”<sup>81</sup> In the end, it is hard to determine to what extent Marshall believes education is for the individual’s development or the benefit of the public.

Although free speech and association are profoundly affected by education, Marshall argues that there is an even closer relationship between education and voting. Voting “has been afforded special protection because it is “preservative of other basic civil and political rights.”<sup>82</sup> Marshall insists that there is a “direct relationship between participation in the electoral process and level of educational attainment” based on data

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<sup>79</sup> 411 U.S. 1, 112-113. Emphasis added.

<sup>80</sup> Quoting *Yoder*, 411 U.S. 1, 112. Emphasis added.

<sup>81</sup> *Wisconsin v. Yoder*, 406 U.S. 205, 245.

<sup>82</sup> Citing *Reynolds v. Sims*, 411 U.S. 1, 114.

from the 1968 presidential elections.<sup>83</sup> As he develops his arguments concerning the franchise, Marshall juxtaposes “*specific constitutional guarantees*” (an emphasis on liberal citizenship) with “*particular personal interest*” (an emphasis on individual development):

... the quality of education offered may influence a child's decision to “enter or remain in school.” It is this very sort of intimate relationship between a particular personal interest and specific constitutional guarantees that has heretofore caused the Court to attach special significance, for purposes of equal protection analysis, to individual interests such as procreation and the exercise of the state franchise.<sup>84</sup>

Even as he underlines that society will be hurt by dependent or non-participating individuals, Marshall recognizes that the individual student is deprived of something when s/he cannot access public education.

Marshall declares education a fundamental right because it is crucial to an individual’s ability to speak, associate, and vote. Education is the “dominant factor in influencing political participation and awareness.”<sup>85</sup> For Marshall, education matters more to an individual’s participation in the political process than public welfare or housing<sup>86</sup> because education has an immediate and direct impact on democratic institutions, Marshall insists on equal access for all groups to public education.

Although Marshall favors treating public education as a fundamental right, he recognizes the difficulty of determining – with any precision – “what *level* of education is constitutionally sufficient.”<sup>87</sup> The Constitution does not require the “most effective speech” or the “most informed vote,” states are required to educate their citizens.<sup>88</sup> Like Brennan, Marshall gives ultimate control of public education to the state as long as they do not deny access to a particular group.<sup>89</sup>

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While the Supreme Court cases do not address science education directly, they establish legitimate state interests in public education for citizens. First, states (and the state) have an interest in creating an educated *political* citizenry capable of military service, jury duty, voting, and criticism of government policy. Second, education maintains the

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<sup>83</sup> 411 U.S. 1, 114. Current studies confirm Marshall’s claim.

<sup>84</sup> 411 U.S. 1, 115. Here, Marshall relies on studies from the social sciences: J. Guthrie, G. Kleindorfer, H. Levin, & R. Stout, *Schools and Inequality* 103-105 (1971); R. Hess & J. Torney, *The Development of Political Attitudes in Children* 217-218 (1967); Campbell, *The Passive Citizen*, in *6 Acta Sociologica*, Nos. 1-2, p. 9, at 20-21 (1962).

<sup>85</sup> 411 U.S. 1, Footnote 72.

<sup>86</sup> 411 U.S. 1, footnote #74.

<sup>87</sup> 411 U.S. 1, 88.

<sup>88</sup> 411 U.S. 1, 116.

<sup>89</sup> 411 U.S. 1, 126: “I do not question that local control of public education, as an abstract matter, constitutes a very substantial state interest.”

stability of democratic institutions by socializing citizens and immigrants to the values upon which government institutions depend. Third, states and individuals have an interest in economic competence. Education allows individuals to compete in markets or for access to higher education. The state has an independent interest in keeping citizens employed. Moreover, the state requires fair markets that select the most appropriate candidates for scarce jobs and opportunities. Thus, education creates the capacity for public reason and undergirds political, social, and economic stability.<sup>90</sup>

But does the state have a duty to create public education systems that encourage citizens to be autonomous persons who think critically about their own economic, political, and social destinies? While Justice Douglass suggests that a child's life is "truncated" if he is not exposed to alternative ideas and encouraged to think critically, the Court has never been clear about the role of education in the development of liberal citizens as moral persons. The Court *has* recognized that the ability of citizens to reason effectively and independently is necessary for a flourishing democratic society. Thus, the interests of the liberal citizen and the moral person are tethered. The ability to criticize political ideas corrects the liberal state but also empowers individuals as free thinkers.

In a federal system, the Court leaves the substance and techniques of education to the states but the Court establishes broad goals for creating capable citizens and workers. Thus, the Court does not help us understand the connection between these goals and the teaching of science – particularly the theory of evolution. Yet the thought of John Dewey can help connect Adam's conception of the political citizen, Gutmann's desire for deliberating majorities, and the teaching of evolution in public schools.

### **III. John Dewey: Science Education as the Foundation of Democratic Politics**

Gutmann demands democratic education that will produce deliberative citizens. She excludes creationism from the science curriculum on the grounds that it is a religious creed that all citizens do not share. Given her goals, Gutmann spends remarkably little time engaging John Dewey's ideas about education and democracy. Like Gutmann, Dewey believes that education helps create deliberative democratic citizens capable of political rule. Unlike Gutmann, Dewey sees *science* education as essential to a thoughtful majority. Dewey can make a positive case for science in public school education – but one that may not satisfy supporters of teaching evolutionary theory.

Like Thomas Jefferson, Dewey sees education as the key to creating a majority that can be trusted to govern – and govern well. Dewey recommends a very particular form of education. Education is not a particular set of facts or "a body of ready-made information."<sup>91</sup> Rather, education trains citizens to think systematically using the

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<sup>90</sup> My understanding of the public/private goods distinction has been enhanced by reading "The State's Obligation to Provide Education: Adequate Education or Equal Education?" by Rob Reich and William S. Koski. Unpublished paper delivered to the American Political Science Association, 2007. As Reich and Koski demonstrate, education has "strong positional aspects" because the unequal education of citizens creates inequality through relative standing in job and educational markets.

<sup>91</sup> John Dewey, *Science and Society* in *Classic American Philosophers*, edited by Max Fisch (New York: Fordham University Press, 1995), p. 387.

scientific method. Students won't all be scientists but they should gain insight into "what scientific method means...rather than...copy...long range and second hand...results which scientific men have reached."<sup>92</sup>

Dewey defines science as "that knowledge which is the outcome of methods of observation, reflection, and testing which are deliberately adopted to secure a settled, assured subject matter."<sup>93</sup> Science education is *not* the teaching of the specifics of any particular field – chemistry or biology – but the foundations of scientific method: the "scientific way of treating the familiar material of ordinary experience."<sup>94</sup> The scientific method is a form of intelligence: a method of experimental inquiry that demands the collection of facts and the observation of relationships between objects.<sup>95</sup> Scientific attitude requires a disciplined mind able to observe the world and understand causal connections. The essence of a scientific attitude is active questioning, delight in the problematic, and desire for a search.<sup>96</sup>

Dewey insists that sixteenth-century European scientific discoveries transformed the way humans think and interpret the world. The scientific revolution rejected an older understanding of *telos* – the insistence on "fixed tendencies toward definite ends," "intentional activity," and "defining forms" – in favor of the observation of patterns "provided by experimental inquiry" and the "operation of reason."<sup>97</sup> The scientific method revolutionized Western Europe's understanding of the *physical* world but it left moral and political ideals virtually intact.<sup>98</sup>

According to Dewey, the works of Charles Darwin signal a shift: the application of science to basic human problems. Before Darwin, Dewey sees a bifurcated approach to the world. The rejection of "purpose" in physics and chemistry was contrasted by approaches in plant and animal life that continued to argue for a *telos* in which early growth foreshadows later development. Dewey explicitly extends the scientific method to the personal and social conduct to provide a "method of moral and political diagnosis and prognosis."<sup>99</sup> The scientific method creates a mode of analysis that can be applied to democratic deliberation: the social, moral, and political world of human beings.<sup>100</sup>

For Dewey, scientific method forces us to interrogate and revise our current beliefs. Our ideals are the product of outworn tradition, chance, dogma, custom, superstition, self-

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<sup>92</sup> John *Democracy and Education, Democracy and Education: An Introduction to the Philosophy of Education* (New York: The Free Press, 1916), p. 221.

<sup>93</sup> *Democracy and Education*, p. 219.

<sup>94</sup> *Ibid.* p. 220.

<sup>95</sup> *The Construction of Good*, p. 373: "For the knowledge of the relations between changes which enable us to connect things as antecedents and consequences is science."

<sup>96</sup> *The Supremacy of Method*, pp. 348-349; 357.

<sup>97</sup> *Ibid.* pp. 350-357; *Democracy and Education*, p. 225.

<sup>98</sup> Dewey insists that this approach remained the accepted philosophy of Europe for "over two thousand years" despite "skeptical and polemic outbursts." *The Influence of Darwinism*, p. 340.

<sup>99</sup> *The Influence of Darwinism*, p. 343.

<sup>100</sup> *The Construction of Good*, pp. 367-371; 373; 378.

interest, personal prejudice, and class interests.<sup>101</sup> Scientific abstraction frees us from what is personal and immediate and this “generalization” is a “social device” that allows for progress.<sup>102</sup> Thus, science education does not merely advance our chosen goals – it forces us to question long-held beliefs and modify our ends. Education in the scientific method inevitably leads to a different understanding of what is desirable: the content of our social aims.<sup>103</sup> The scientific method leads democratic citizens to question traditional religious and political institutions and change the substance of their economic, political, and moral values and goals.<sup>104</sup>

According to Dewey, the application of scientific method leads to substantial changes in the development of economic, political, and moral life. First, science allows for the development of technology which drives industry and economic development.<sup>105</sup> Second, the scientific method enables the democratic public to recognize the nature of the problems it must control and form a shared will. The public must comprehend the costs of pursuing their ends and understand the causal connections. Because *every* citizen has a voice in decision-making, each individual must have the capacity to think for herself. As humans rely on scientific explanations rather than mystical, religious, or superstitious explanations for natural phenomena, they come to control themselves and gain “intellectual self-possession.”<sup>106</sup> Thus, the healthy functioning of democracy and individual autonomy are inextricably linked in Dewey’s system.

Dewey’s brief history of the scientific method and his conception of education and the scientific method clarify what is at stake in today’s debate over intelligent design and the teaching of evolutionary theory. Through Dewey, we can see how intelligent design advocates for a return to *telos* and fixed purpose.

Dewey describes an early twentieth century theory which he calls the “design argument” – that insists that living forms have a “rational ideal force...working out its own ultimate manifestation.”<sup>107</sup> Like today’s ID, the “design argument” holds that complex organs – like the eye – are the product of a purposeful design: an intelligent force creates the perfect form.<sup>108</sup> The “design argument” also allowed that *some* aspects of change are through chance and natural selection:

The design argument thus operated in two directions. Purposefulness accounted for the intelligibility of nature and the possibility of science, while the absolute or cosmic character of this purposefulness gave sanction and worth to the moral and religious endeavors of man. Science was underpinned and morals authorized by one and the same principle, and their mutual agreement was eternally

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<sup>101</sup> *Science and Society*, pp. 382-383; 388; *Democracy and Education*, p. 223.

<sup>102</sup> *Democracy and Education*, pp. 225-227.

<sup>103</sup> *Ibid.* p. 225.

<sup>104</sup> *Science and Society*, p. 383.

<sup>105</sup> *Democracy and Education*, p. 224.

<sup>106</sup> *Ibid.* pp. 228-230.

<sup>107</sup> *The Influence of Darwinism*, p. 340.

<sup>108</sup> The example of the eye is repeatedly used by ID and mentioned by Dewey in his description of design theory. *Ibid.* p. 340.

guaranteed.<sup>109</sup>

Contemporary ID offers a similar combination of science and intelligent direction. Science allows us to examine and understand the eye – but we ultimately conclude that it was designed in advance by an intelligent force. Darwin’s principle of natural selection challenged intelligently directed development. If the changes in organisms are due to natural selection, there is “no call for a prior intelligent causal force to plan and preordain them.” For Dewey, the debate is about “design *versus* chance.”<sup>110</sup>

Today’s ID explicitly advocates a return to a version of *telos* in order to understand the physical world. But ID implicitly calls for a return to absolute origins and finalities in morals and politics. Advocates of ID understand Dewey better than Gutmann. They seek to reverse what Dewey’s greatest hope for the maintenance and progress of democratic societies: scientific method as the foundation of a strictly secular citizenship providing standards of proof and a systematic method of thinking and deliberating. ID strategically mixes scientific method and *telos* in order to undermine the scientific method as a source of citizenship.

Whereas Gutmann and the courts address ID as a case of religious establishment that threatens the equality of all citizens, Dewey explicitly connects the teaching of science to the maintenance of democratic politics. He insists that the scientific method is the foundation of democratic citizenship. Science education is inextricably linked to economic competence, autonomy, and political functioning. If science is increasingly important in political discourse (e.g. global warming and genetic engineering), then Dewey’s analysis seems increasingly relevant.

But Dewey remains problematic. First, Dewey insists that democratic citizens can use science instrumentally to understand and “master” the natural world for their own chosen ends.<sup>111</sup> Dewey’s confidence in humans’ ability to control the future through intelligence, knowledge, and science is troubling. Although Dewey recognizes that humans are dependent on natural processes,<sup>112</sup> he ignores the effect technology can have on humans and their ends. Second, Dewey uncomfortably mixes science and technology. Third, Dewey insists that democratic society invest in a notion of “progress” that is remains highly controversial. Last, Dewey repeatedly speaks of the scientific method as a “faith”<sup>113</sup> without interrogating the extent to which science does not provide us with a neutral arbiter of the good – though it does provide democracy with a non-religious benchmark for evaluation. Supporters of ID don’t see science as neutral – they believe commitment to science is a rejection of theism.

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<sup>109</sup> *Ibid.* Some naturalists, like Asa Gray, explicitly tried to reconcile natural selection with “design.” Dewey names this “design on the installment plan.” *Ibid.*, p. 341.

<sup>110</sup> *Ibid.* p. 341.

<sup>111</sup> *Democracy and Education*, p. 224; *Science and Society*, pp. 381-383; 387; *The Construction of Good*, p. 372.

<sup>112</sup> *Democracy and Education*, p. 228. Emphasis added.

<sup>113</sup> *Science and Society*, p. 389; *Creative Democracy*, repeatedly on pp. 392-393.

## VII. Conclusion: The Positive Case for Science in Liberal Democracy

Political theorists should embrace the *Dover* case as an opportunity to explore the relationship between education, science, and liberal democracy. Liberal democratic theory can make a case for science education on the grounds that the capacity to think critically is essential to political citizenship, economic competence, and moral autonomy. First, education must create politically capable citizens with civic knowledge, deliberative competence, and the ability to vote, serve on juries, and complete military service. Second, education must create economically competent citizens who are independent and self-reliant: able to participate and compete in the economy. Last, education should create moral persons capable of choosing their own ends. Liberal education should guarantee all three aspects of liberal personhood.

The liberal state is justified in securing a curriculum in terms of content and structure that teaches students – as potential citizens, workers, and moral persons – to make thoughtful decisions. Adams requires that citizens be able to read, write, and think critically about government. Gutmann asks for them to deliberate and be actively involved in the public decisions. Dewey insists that education for public deliberation is only possible if the scientific method is learned by students and applied by citizens.

If we accept Dewey's claims, we cannot argue that liberal government requires the teaching of the theory of evolution. Dewey dismisses the need for any particular *content* in education. Children do not need to master a set of facts – they need a method for judging and assessing their lives and the political world. Thus, Dewey can only require the Dover school district to teach the children scientific method – through a variety of possible physical, natural, and social sciences.

Supporters of teaching evolution in public schools may be disappointed in this conclusion. But Dewey's strong support for method does something that the Supreme Court and Amy Gutmann cannot. Dewey can exclude intelligent design from science classes in public schools *without* relying on the first amendment's exclusion of an establishment of religion. If intelligent design is excluded for non-religious reasons, the intent of the creators of intelligent design is irrelevant. Intelligent design or creationism can be excluded as "not science" or "bad science." Dewey supplies modern jurists and theorists with a way to exclude intelligent design even if it is not connected with creationism and, more importantly, it supplies liberal democracy with a clear justification for teaching evolution – or any other physical, natural, or social science that depends on the scientific method – in public schools. Whereas Dover can only exclude intelligent design because it is veiled religion, Dewey can support the teaching of evolutionary theory because it supports the scientific method as a foundation for, political citizenship, economic competency, and moral autonomy.

Dewey cannot demand evolution as part of the public education curriculum – but he understands Darwin's theory of evolution to be of particular importance to the application of scientific method to the study of ethics, society, politics, and the economy. For Dewey, the scientific revolution applied the scientific method to the physical world – but

until Darwin, scientific method was not the foundation of social and political thought. Dewey may have overstated the importance of Darwin and underappreciated the importance of science in seventeenth century liberal thought but he sees Darwin's theory of evolution as important to the history of the scientific method.

Dewey isn't that far from Gutmann. For Dewey, democracy is about consultation, conference, persuasion, and discussion. But he connects science and scientific method to these democratic values in a way that Gutmann does not. Gutmann sees the debate over creationism as religion repressing the individual in the public schools. Dewey sees teaching evolution as creating a "scientific attitude" that enables deliberative discussion and democratic decision-making. Discussion cannot be freed from the authority of tradition, superstition, and unexamined rationalizations without citizens who weigh facts, observe relations, and reason carefully. Only in the context of a society in which scientific method guides thinking can each individual realize their potential. Thus, Dewey combines an interest in the preservation of democratic society *and* the autonomy of the individual.

Liberal regimes will struggle over who will determine what is "bad science" in a public school curriculum. Gutmann bristles over allowing "elites" to determine what an appropriate school curriculum looks like. But if we believe democracy is enhanced by teaching scientific method, there must be some means to exclude. In the case of *Dover*, local majorities justified the criticism of the theory of evolution on the grounds that it *increased* deliberation by giving students an "alternative." Gutmann may object that it is undemocratic to take the decision away from local majorities – but if liberal democracy requires critical thinking, liberals may need to insist on protecting the essence of democratic reproduction against temporary and local majorities. The liberal state is justified in securing a curriculum that in terms of content and structure teaches the scientific method.

It is crucial to understand the debate over *Dover* as more than teaching religion in the public schools. The case raises much more serious questions about the origins of American democracy and the requirements of citizenship and political reproduction in a liberal regime.

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