Evolution in America: Four False Narratives and One Right One

R. Allen Bolar
University of California, San Diego

Of 35 countries surveyed for a 2005 poll on the public acceptance of evolution, the United States ranked next to last.[1] About as many Americans believe in evolution as creationism, but Americans believe in naturalistic evolution—the theory that humans evolved naturally over millions of years without divine guidance—at about a 14% rate.[2] Charles Darwin and the theory of evolution remain controversial though it has been 150 years since Darwin published his *Origin of Species*. Evolution is the foundation of modern biology and is accepted by all but a trivial portion of America's scientists and researchers. The few exceptions to scientific unanimity represent naught but a rounding error when compared to the entire American biological community. How can we explain this perplexing phenomenon? This project will seek to do so by looking at the politicization of the biological sciences in nineteenth century America.

It is often taken for granted that evolutionary science conflicts with religious doctrine and that this conflict explains Darwin's tepid reception in the United States. The evolutionary biologist Stephen Jay Gould has called the scientific creationist movement "peculiarly American".[3] The popular image of the evolution/creation debate in America is present in the famous Scopes Monkey Trial. In 1925 the Scopes Monkey Trial was hailed as the "Trial of the Century" and passed into legend as the clash of fundamentalist religion

[1] The United States ranked above only Turkey. Miller, Jon D.; Eugenie C Scott; Shinji Okamato. "Science Communication: Public Acceptance of Evolution," in *Science*, Vol. 313, No. 5788 (Aug. 11, 2006), pp. 765-66.
[2] Gallup Poll. May 8-11, 2008. N=1,017 adults nationwide, MoE +/- 3%. www.pollingreport.com/science
[3] "Creationism in NZ 'Unlikely,'" *New Zealand Herald*, July 3, 1986, p. 14 (quoting Gould).

with rational, scientific truth. John T. Scopes was found guilty of teaching evolution under Tennessee law and fined $100, because Scopes supposedly taught from George W. Hunter's 1917 edition of the textbook *Civic Biology*.[4] Attorneys for the prosecution and defense, William Jennings Bryan and Clarence Darrow, are long since gone, but not the issues over which they fought. Though the Supreme Court has banned the teaching of creationism in American public schools, the role of creationism and intelligent design in America's public school biology courses remains a politically potent issue. Public opinion polls show that Americans support teaching creationist theories alongside evolution by a wide margin.[5]

That there exists such disconnect between scientific and public opinion should surprise us. In this project I propose to explain this phenomenon by examining the nineteenth century political and social context in America which politicized the debates surrounding the reception to Darwinism and examine the ways that evolution fed into American debates over race and identity. This politicization led, in turn, to a decrease in the epistemic authority of biological scientists in America. I will begin by surveying four traditional narratives through which scholars traditionally seek to understand the story of evolution in America, demonstrate why I believe they are inadequate, and then begin discuss an alternative political frame through which to view this phenomenon.

Four Traditional Narratives

How can we understand the complex reception that America has had with evolutionary biology? Typical studies explain regional and cross-national variation use

[4] Larson, Edward J. *Summer for the Gods: The Scopes Trial and America's Continuing Debate Over Science and Religion*. (New York: BasicBooks, 1997).
[5] 65% in favor, 29% opposed, 6% unsure. CBS News/New York Times Poll. Nov. 18-21, 2004. N=885, MoE +/- 3%. www.pollingreport.com/science

four dominant methods to describe the history of American debates over Darwinism[6] or its impact on American social and political thought. In the past, scholars have explained evolution's acceptance as a function of *culture*, *class*, *education*, and *religion*. This project will show that these traditional explanations inadequately capture the entire story.

Stories that employ the first two mechanisms, culture and class, tend to focus on Darwinism's *success* in America, most particularly evolution's relative success in the Northeastern states. Darwinian evolution is examined as an intellectual enterprise fitting into, and often strengthening, a preexisting mold of either middle class cultural mores or gilded age tycoon capitalism. Stories that employ the latter two explanatory devices, education and religion, tend rather to focus on the relative *failure* of Darwinism to overcome American scientific ignorance and religious hostility. Evolution's controversial status, particularly in the American South and Midwest, is explained by those regions' supposed provincialism and religiosity.

I propose an alternative analysis based on the politicization of Darwinian evolution to explain the American reaction to evolutionary ideas of human origins. We must understand how American debates over Darwin's theory of evolution have been shaped by broader social and political trends, most especially regarding issues of race and identity, and in return why the nature of Darwinian science made it applicable to rival American conceptions of racial identity. My intention is to show that America's conflicted relationship with Darwinism is largely the product of the politicization of biological science

[6] "Darwinism" does not have, of course, only one definition. Here it shall be used, roughly, as synonymous with a naturalistic conception of evolution. Nearly all biologists and naturalists were convinced by Darwin's account of evolution but many remained skeptical about natural selection until the twentieth century. Nevertheless, these "incomplete" Darwinists are still Darwinists in my definition. As James Moore has made clear there have been many "Darwinisms" not only over the last 150 years but immediately following the publication of *Origin of Species* in 1859. See, for example, Moore's "Deconstructing Darwinism: The Politics of Evolution in the 1860s," in *Journal of the History of Biology*, Vol. 24, No. 3 (Autumn, 1991), pp. 353-408.

in nineteenth century America. Evolution's applicability to debates over the nature of race and human identity raised the political and social stakes of biological accounts of human origins. The politicization of evolution lowered Americans' trust in the objective authority of the scientists who practiced biological science. I shall first proceed by discussing the inadequacy of the current analytical frameworks for discussing the history of evolution in America.

Evolution and Middle Class Culture

One common lens for looking at the history of evolution in America is that of cultural and intellectual history. Explanations that rely on the distinctiveness of American middle class culture have a long pedigree. From Weber's *Protestant Ethic and the Spirit of Capitalism* to Louis Hartz's *Liberal Tradition in America*, American attitudes towards work, politics, and society have been defined by its Protestant culture and lack of landed aristocracy, which it is said gave to the United States its particular brand of 'middle-classness'. Without a landed aristocracy relying on the Church for authority and privilege and without a tradition of organic, hierarchical tory conservatism, American culture is said to unusually prize the ideals of merit, hard work, progress, and struggle. The explanatory power of middle class culture is used by scholars such as David Hull to explain receptions to Darwinian ideas.[7] In this narrative Darwinism in America becomes a story about the cultural applicability to middle class mores of an evolutionary theory in which humankind is placed firmly within the laws of a natural world of competition and struggle.

[7] Hull, David L. "Deconstructing Darwin: Evolutionary Theory in Context," in *Journal of the History of Biology*, Vol. 38, No. 1, The "Darwinian Revolution": Whether, What and Whose? (Spring, 2005), pp. 137-152.

Darwinian natural selection is seen as conforming to American folkways, and a biological theory of the natural world exalting competition and 'survival of the fittest' will find an intellectual home in "middle-class" American culture. The cultural hypothesis has some explanatory power for understanding regional variation within the United States. David Hackett Fischer's *Albion's Seed* revisits Louis Hartz's germ theory of American culture, and in which Fischer tells us that the culture of the American South is a product of a "landed royalist" migration more akin to the aristocratic Tories of England than the migrations that populated New England.[8] Perhaps then, this distinct cultural founding explains the variation found between New England and the southern states over the acceptability of Darwin's theory of evolution. One newspaper editorial in 1925 saw the Scopes trial as a clash between calcified tradition and modern science. "It will be established at Dayton, beyond doubt, that the South prefers its traditions to science; its Southern self exaltation to any truth science may have discovered, or may yet discover."[9] A paternalistic, hierarchical southern culture of landed planters might find Darwinism more unsettling to traditional southern cultural values and morality. In regions of the United States that conform less to this "middle class" ideal-type, such as the American South, we will expect more resistance to the supposedly Darwinian ideals of competition and progress.

There are problems with the cultural hypothesis, however. It fails to explain cross-national variation adequately, for in the supposedly fertile middle-class parts of America

[8] Fischer, David Hackett. *Albion's Seed: Four British Folkways in America*. (New York and Oxford: Oxford University Press, 1989).
[9] Pittsburgh Courier, June 6, 1925, p. 16. Quoted in Moran, Jeffrey P. "Reading Race into the Scopes Trial: African American Elites, Science, and Fundamentalism," in The Journal of American History, Vol. 90, No. 3 (Dec., 2003), pp. 891-911.

we still observe lower levels of acceptance to evolution than in less "middle-class" countries in Europe, for example. It also conflicts with our understanding of the relationship between Protestantism and evolution. The supposed applicability of evolution to nonconformist Protestantism did not make Protestants more receptive to Darwin than average. They have been and remain, on the contrary, less receptive.

Class

Another story emphasizes class and economic interest to explain America's receptivity to evolutionary ideas. Examples include Richard Hofstadter's *Social Darwinism in American Thought* (1944), Robert Bannister's *Social Darwinism* (1979), as well as Barry Werth's more recent *Banquet at Delmonico's* (2009).[10] This line of scholarship claims that America's brand of laissez-faire capitalism proved congenial to Darwinism, because natural selection and Darwin's vision of competition in nature mirrored gilded age economic interests.[11] There are many who have pointed out the joint influence that Thomas Malthus has had both on Darwin and modern economics.[12] Herbert Spencer's vogue in the United States is explained as the product of capitalists and businessmen during the Gilded Age

[10] Richard Hofstadter, Social Darwinism in American Thought. (Philadelphia: University of Pennsylvania Press, 1944); Robert C. Bannister, Social Darwinism: Science and Myth in Anglo-American Social Thought. (Temple University Press, 1979); Barry Werth, Banquet at Delmonico's: Great Minds, the Gilded Age, and the Triumph of Evolution in America. (New York: Random House, 2009).

[11] See, for example, Ghiselin, Michael T. "Perspective: Darwin, Progress, and Economic Principles," in Evolution, Vol. 49, No. 6 (Dec., 1995), pp. 1029-1037, and Rogers, James Allen. "Darwinism and Social Darwinism," in Journal of the History of Ideas, Vol. 33, No. 2 (Apr.-Jun., 1972), pp. 265-280.

[12] Peter J. Vorzimmer, "Darwin, Malthus, and the Theory of Natural Selection," in *Journal of the History of Ideas*, Vol. 30, No. 4 (Oct.-Dec., 1969), pp. 527-542; Robert M. Young, "Malthus and the Evolutionists: The Common Context of Biological and Social Theory," *Past and Present*, Vol. 43 (1969), pp. 109-45; Sandra Herbert, "Darwin, Malthus and Selection," in *Journal of the History of Biology*, Vol. 4, No. 1 (Spring, 1971), pp. 209-217; Peter J.Bowler, "Malthus, Darwin, and the Concept of Struggle," in *Journal of the History of Ideas*, Vol. 37 (1976), pp. 631-50; Scott Gordon, `Darwin and political economy; the connection reconsidered', *Journal of the History of Biology*, Vol. 22 (1989), pp. 437-59; Greta Jones, "Alfred Russel Wallace, Robert Owen and the theory of natural selection," *The British Journal for the History of Science*, Vol. 35, No. 1 (Mar., 2002), pp. 73-96.

responding to 'social Darwinism', because it aligned with the free market principles of laissez faire. Spencer's vision of societal progress and health achieved through competition without governmental interference suited the material interests of the burgeoning industrial elite and the small shopkeepers that formed the backbone of the northern industrial economy. Henry Commager claims that "between them Darwin and Spencer exercised such sovereignty over America as George III had never enjoyed."[13]

There is power in a materialist explanation that Americans believed in evolution when they found it congenial to their economic interests. It is in the industrialized north and amongst its industrial, capitalist class that Darwinian ideas were most fully accepted. In his dissent to *Lochner* v. *New York*, Justice Holmes felt it necessary to remark that "The Fourteenth Amendment does not enact Mr. Herbert Spencer's *Social Statics*...[A] constitution is not intended to embody a particular economic theory, whether of paternalism and the organic relation of the citizen to the state or of laissez faire."[14] As Theodore Lowi points out, this makes Justice Holmes "one of the better prophets and one of the worst historians of his day."[15] For many Spencer, Darwin, and evolution demonstrated the propriety of laissez-faire ideology. Some have questioned the degree to which the average American businessmen actually justified their business practices with evolutionary ideas[16], but Spencer's 'survival of the fittest' and Darwinian natural selection were certainly seen by intellectuals and business elites as congenial to laissez-faire.

[13] Commager, Henry. *The American Mind*. (New Haven: Yale University Press, 1950), pp. 89-90.
[14] Oliver Wendell Holmes, dissent, *Lochner v. New York*, 198 U.S. 45, 75 (1905).
[15] Theodore J. Lowi, *The End of Liberalism: The Second Republic of the United States*. (2nd edition) (New York and London: W.W. Norton & Company, 1979), p. 5.
[16] Wyllie, Irvin G. "Social Darwinism and the Businessman," in *Proceedings of the American Philosophical Society*, Vol. 103, No. 5 (Oct. 15, 1959), pp. 629-635.

Yale economist and philosopher, William Graham Sumner, epitomized this confluence of free market capitalism and nineteenth century biological science.[17] Sumner held that society best develops when free from governmental interference, and that this vision was justified by analogy to the design found in a progressive, competitive natural world.[18] The steel magnate and philanthropist Andrew Carnegie believed in the power of social Darwinism to better American civilization. "The price which society pays for the law of competition, like the price it pays for cheap comforts and luxuries, is also great; but the advantages of this law are also greater still…and while the law may be sometimes hard for the individual, it is best for the race, because it insures the survival of the fittest in every department." [19] One argument made against evolution by Tories in England was that a belief in the transmutation of species would upset the natural order. For members of England's landed aristocracy upsetting the social status quo with theories of natural progress and free competition was more than merely 'reckless'; it also implied an end to privilege inherent in a static, organic hierarchical order. In the United States, the closest equivalent to this landed aristocracy was the southern paternalist planter class, which depended on these hierarchies not being upset. Southern planters were resistant to the meritocratic ethos of liberal capitalism, and it accords with the materialist explanation that it is in the least capitalist parts of the United States, e.g. the South, were most hostile to Darwin's ideas.

However, there are limits to the materialist explanation. Like the cultural hypothesis, an appeal to materialist interests fails to hold up to cross-country comparison.

[17] See, for example, Sumner's *What Social Classes Owe to Each Other* (1883/Reprint: Caxton Press, 2003).
[18] Menand, Louis. *The Metaphysical Club: A Story of Ideas in America*. (New York: Farrar, Straus and Giroux, 2001), pp. 302, 431-432.
[19] Andrew Carnegie, "Wealth," *North American Review*, Vol. 148, No. 391 (June 1889), pp. 655.

The northern American states are, relative to the southern states, more accepting of Darwin and evolution, but less so than many other countries. England, France, Canada, Germany, and Russia have all been more receptive to Darwinian ideas than even the northern, most industrial, parts of the United States. It is difficult to argue that these countries are all more 'capitalist' or laissez faire than the United States; in fact, communist countries, such as the former Soviet Union, have adapted evolution to accord with their quite different conception of materialist interest.

Education and Scientific Literacy

The problem with appealing to culture and class is that triumphalist accounts of Darwinism in America imply that the United States was receptive to evolutionary biology, while in fact it has proven particularly resistant. One way to explain resistance to Darwinian evolution is lack of education or scientific literacy. A narrative based on American hostility to evolution may prove more satisfying, and indeed there is a scholarly tradition on the anti-intellectualism of the American mind.[20] According to Richard Hofstadter, "the common strain that binds together the attitudes and ideas which I call anti-intellectual is a resentment and suspicion of the life of the mind and of those who are considered to represent it; and a disposition constantly to minimize the value of that life."[21] The provincialism of American science or the American mind is often invoked to explain this acceptance "gap." If nineteenth century American science lacked the tradition and

[20] For a classic statement of the American anti-intellectualism thesis see Richard Hofstadter's 1963 study, *Anti-Intellectualism in American Life*. For more recent iterations of this thesis see Susan Jacoby's *The Age of American Unreason* (New York: Pantheon Books, 2008) or Jennifer Ratner-Rosenhagen, "Anti-intellectualism as romantic discourse," in *Daedalus*, Vol. 138, No. 2 (Spring 2009), pp. 41-52.
[21] Hofstadter (1963), p. 7.

expertise necessary to reach into the American hinterlands and set the agenda for broader patterns of American public education, then an initial American unfamiliarity with evolution combined with an American aversion to expert opinion might explain the American public's hostile reception to Darwinian evolution.

In the nineteenth century there was indeed a lower level of biological and scientific scholarship in America than in countries such as England and France with longer, more distinguished scientific traditions. The most famous naturalist in America in the middle part of the nineteenth century was not a native-born American but a transplanted Swiss, Harvard's Louis Agassiz. Because of the frontier and provincial nature of American scientific scholarship, it's argued that Americans were either more distrustful or simply less aware of the success of scientific demonstration and scientific truth. The South enjoyed the least education as a region—and the South was particularly hostile to evolution. Provincial habits and frame of mind are used to explain American's comparatively cooler reception to the new evolutionary biology.

Controversy over the teaching of evolution in America's schools has meant that students' exposure to evidence for evolution has been both less thorough and more hesitant than in other countries.[22] Though creationism is not taught in public schools today (actually it sometimes is, just surreptitiously[23]), evolution's controversial status

[22] D. Aguillard, "Evolution Education in Louisiana Public Schools: A Decade following *Edwards v. Aguillard*," *American Biology Teacher*, Vol. 61 (19 99), pp. 182-188; M. L. Rutledge and M. A. Mitchell, "High School Biology Teachers' Knowledge Structure, Acceptance, and Teaching of Evolution," Vol. 64 (2002), pp. 21-28; Randy Moore, "Teaching Evolution: Do State Standards Matter?," *Bioscience*, Vol. 52, No. 4 (April 2002), pp. 378-381; Randy Moore, "The Creationist Down the Hall: Does It Matter When Teachers Teach Creationism?," *Bioscience*, Vol. 59, No. 5 (May 2009), pp. 429-435.

[23] *Edwards v. Aguillard*, 482 U.S. 578 (1987) established the teaching of creationism in public school classrooms as unconstitutional in, but many teachers still want to and do teach creationism in their courses. One study of biology teachers in Louisiana showed that 29 percent want to teach creationism and 14 percent actually do (Aguillard, 1999). In addition, biology teachers who are more wary of the law can choose to ignore evolution or, as my 10th-grade biology teacher did, give equal time to the pastor of a local evangelical church to speak about creationism.

incentivizes local school boards and teachers to present evolution as mere "theory" and to limit the time spent on evolutionary material, because it can be a risky business to offend either students or parents. Scientific doctrines can seem perplexing and counterintuitive, especially if presented as disputed or unsure. It might be the case that without a proper scientific education one cannot overcome traditional "common sense" beliefs. Maybe evolution is rejected because it is not properly understood. Level of education does correlate with belief in evolution in public opinion polls. People with graduate degrees are far more likely to believe in evolution than those with only a high school degree or less. There is both contemporary and historical validity to this explanation.

The problem with this argument is that even in the nineteenth century education and learning in America was not as provincial or underdeveloped as the "bumpkin" American story requires it to be. The literacy rate in the United States was higher than in England. American children spent more time in school and away from work, and American schools were more accessible to those outside of an elite upper-class than their English equivalents. Newspaper readership in America was very high, and sales of books, journals, and magazines sold very well, more even than in England. Popular magazines carried news of the latest natural history discoveries, and theories of the scientific avant-garde spread quickly and broadly across the continent. Public intellectuals did a brisk trade in public lectures, often selling out large auditoriums. Science was an important part of the secondary school education, and science enjoyed a significant following amongst an American middle class with its improving numeracy and literacy.[24] For most, the American educational system was better than England's. It seems odd, then, to say that the average

[24] Howe, Daniel Walker. *What Hath God Wrought: The Transformation of America, 1815-1848*. (Oxford: Oxford University Press, 2007), p. 466.

American citizen was more "provincial" and less educated than the average English subject. More recent surveys of scientific literacy show that while Americans are more hostile to evolution, their knowledge of science in general is roughly equal to that of the British.[25] If the American mind and educational system are responsible for American attitudes towards evolution, then why has this hostility not been replicated in other areas of scientific knowledge?

Perhaps what matters is not the scientific knowledge of the average person but the level of scholarship in a nation's institutions of higher learning. Here indeed the argument of provincialism has more merit. The upper crust of scholarship and high science did trail behind Europe's and England's in the middle part of the nineteenth century. The British Isles had had a long history of producing great works of science, first-rate Universities, more medical training, and greater scholarly exposure to scientific theories on the Continent. The United States had some history with scientific endeavor and some fine schools on the east coast, such as Harvard, Princeton, and Yale, but for the most part scholarship in natural history trailed European centers of learning. Even these universities were quasi-religious institutions focusing on classical liberal education not fields of research like medicine and natural history. The Northeast cities were America's centers of learning, and the Northeast became the region most receptive to Darwinian ideas. One sees an inverse relationship between the acceptance of evolution in a given location and its distance from Harvard. However, after the Civil War, the second-tier American science improved. Land-grant universities educated farmers' sons and daughters in the prairie

[25] Durant, John, Geoffrey Evans, and Geoffrey Thomas, "The public understanding of science," in *Nature*, Vol. 340 (6 July 1989), pp. 11-14. See also, National Science Board, "Public science literacy and attitudes toward science and technology," in *Science and engineering indicators*, (Washington, DC: National Science Board, 1990), pp. 162-77.

states of the Old Northwest far away from Boston and New York, and the triumvirate of Harvard, Yale, and Princeton secularized and began to emphasize scientific empiricism over the traditional liberal arts. To these schools would be added other institutions, such as Cornell, that would produce science and scholarship to rival or exceed that of Europe.

Religion

Most commonly, America's relationship to Darwinism is viewed as a reaction to religion. This formulation of anthropologist Christopher Toumey is typical: "The creation-evolution controversy is obviously an interaction between science and religion, such that it is common to diagnose creationism as a case of using fundamentalist beliefs to control scientific knowledge."[26] The historiography of the conflict between religion and science is long and distinguished.[27] Certain reliable figures, Galileo and the medieval Catholic Church for example, are trotted out to demonstrate the adversarial relationship between the sacred and the secular, tradition and enlightenment, or faith and reason. One recent book situates the reaction of religion to evolution as but merely the latest skirmish in a 2,500 year war fought by creationists against materialism since the ancient Greek Epicurus.[28] In the United States the Scopes Trial often stands as the definitive confrontation between evolutionary science and fundamentalist religion. *Inherit the Wind* colors our imagination.

Using religion to explain Darwin's reception in America is appealing. Firstly, evolution does seem to conflict with some theological doctrines. Evolution's timeframe

[26] Christopher Toumey, "Modern Creationism and Scientific Authority," *Social Studies of Science*, Vol. 21, No. 4 (Nov., 1991), p. 681.
[27] Two classic statements of the warfare thesis are John William Draper's *History of the Conflict Between Religion and Science*. (New York: 1875) and Andrew Dickson White's *A History of the Warfare of Science with Theology in Christendom*. 2 Vols. (New York: Appleton, 1896).
[28] Foster, John Bellamy; Brett Clark; and Richard York. *Critique of Intelligent Design: Materialism versus Creationism from Antiquity to the Present*. (New York: Monthly Review Press, 2008).

conflicts with biblical accounts of an Earth less than 10,000 years old, and its materialism seems to deny the presence of an active god, and, for many, that means to remove the source of moral authority. The fear of moral relativism haunts anti-evolutionism. The 1871 *Times* of London review of Darwin's *Descent of Man* accused Darwin of "undermining all authority" and proposing an amoral, or even immoral, doctrine. One of Charles Darwin's nicknames was the "Devil's Chaplain." James Moore's *The Post-Darwinian Controversies* is an example of the sort of work that focuses on the interaction of religion and evolutionary science after the publication of Darwin's *Origin of Species*.[29]

Americans have been and are more religious than Europeans, and Protestantism in the United States is more evangelical and fundamentalist than elsewhere. There is a strong correlation between religiosity and rejection of evolution within the United States. American regions most hostile to evolution are the Midwest and South, which historians often casually accept this regional variation as the combined product of provincialism and religiosity. As Ronald L. Numbers says, "because people in the [South] were more religiously conservative and less well educated than people in the North, such differences were only to be expected."[30]

However religion alone cannot satisfactorily explain why religious people have both accepted and rejected Darwinism. The view that science and religion are inherently rival is anachronistic to the nineteenth century for most nineteenth century intellectuals assumed that the truths of religion and science were in harmony rather than conflict. Reason and revelation were seen as mutually reinforcing views of God's laws. It is inadequate to argue that religion *is* hostile to science without understanding *why* evolutionary biology, in

[29] Moore, James. *The Post-Darwinian Controversies*. (Cambridge University Press, 1979)
[30] Numbers (1998), *Darwinism Comes to America*, p. 58.

particular, has generated religious resistance in certain contexts but not others. There are three reasons for this: 1) Many scientific theories do not challenge religious doctrine, 2) Many scientific theories that do seem to challenge religious doctrines are ignored anyway, and 3) Religion has proven able to adapt doctrine to align with scientific discoveries. It is not clear *a priori* that religion should prove uniquely hostile to evolutionary biology. Indeed many religious people and denominations accept human evolution as fact.

That evolution was an important scientific theory does not guarantee hostile religious sentiment. James Clerk Maxwell's work on electromagnetism was as important to the physical sciences as Darwin's to the biological sciences, and yet little response has been recorded by either mainline or evangelical Protestants in America regarding electromagnetism. Other scientific theories might be seen to contradict the bible, but have been largely ignored by religious thinkers and which the religious believe at equivalent rates as the nonreligious. For example, the laws of thermodynamics predict that the universe will eventually devolve into a state of chaotic heat death. One could imagine the 2nd law of Thermodynamics sparking debate over creation, the space for God's benevolence in the universe, or descriptions of end times. During the nineteenth century there were some debates on the subject, but these remained relatively minor. Today, all else being equal, theists are no more likely than atheists to deny the laws of thermodynamics. People can also distinguish between epistemology and ontology. Some scientists practice 'methodological naturalism' though they are theists. It is possible to live with theoretical contradiction between scientific education and religious doctrine. Mere contradiction cannot explain the religious response to biological evolution.

The third reason we cannot assume an inherent conflict between religion and evolution is that religious doctrine has proven quite capable of incorporating and adapting to scientific discoveries. Perhaps the most famous example is the Galileo affair. Galileo Galilei's argument that the Earth revolves around the Sun caused conflict with seventeenth century religious authorities, but the religious are no less likely today to accept the heliocentric solar system, today. Though the Copernican system was once thought to contradict a number of biblical passages, both Protestants and Catholics have adapted religious orthodoxy or reinterpreted biblical passages to coincide with scientific views. In addition the last 150 years has witnessed the rise of 'scientific' literary analysis that treats the Bible as historical document, and many denominations have successfully adapted to these 'modernist' reinterpretations of scripture.

Why have American churches not also adapted to accord with biological evolution? In fact, they often have. Many religious denominations accept theistic evolution, and postulate evolution and natural selection as God's mechanism for creating species. After 1859, some religious authorities argued that Genesis did not conflict with evolutionary science. The 1873 meeting of the Evangelical Alliance accepted M. B. Anderson's theory that Protestants could accept both Darwinian evolution and Christian theology.[31] The two most common types of 'old-Earth' creationism are the 'day/age' explanation, which interprets the Genesis account of six days of creation as six ages of unspecified length rather than literal twenty-four hour periods, and the 'gap theory' which claims a gap period between the first two verses of the Bible of unspecified length. These explanations attracted considerable support then and now.

[31] George M. Marsden, *Fundamentalism and American Culture* (2nd Edition), (Oxford and New York: Oxford University Press, 2006).

The fundamentalist William Jennings Bryan did not subscribe to the young Earth hypothesis, and he was not alone among fundamentalists. George Frederick White, author of *The Fundamentals*, subscribed to the same view as Bryan, and so did William Bell Riley, the head of the World's Christian Fundamentals Association. Until the middle part of the twentieth century fundamentalist insistence on six days of 24 hours each was confined mostly to a relatively small group of Seventh-Day Adventists. Fundamentalists argued over the merits of the three interpretations of Genesis (6 days, 6 ages, 'gap' theory), but it was not a question of heterodoxy. Theorists in all three camps considered themselves to biblical literalists. A commitment to literalism does not exclude the interpretation of scripture.[32] Bryan, along with the evangelical evolutionists James Dwight Dana, subscribed to the day/age theory and accepted that the Earth was millions of year old, yet they held differing views on Darwinian evolution.[33] Religion alone is not enough to explain the variation that we observe.

Nineteenth century biological science after Darwin challenged slavery, as well as scientific theories that used biological determinism to argue that blacks were inferior to whites. After Darwin's ascendancy, the natural sciences became associated with abolitionists and racial egalitarians and became politically distasteful to southern planters and white supremacists, who benefited from a power structure premised upon black inferiority. If nineteenth century science challenged the authority upon which the southern power structure rested, then it would benefit southerners to deemphasize science in favor of the authority of a more politically congenial biblical literalism.

[32] "I believe everything in the Bible should be accepted as it is given there; some of the Bible is given illustratively. For instance: 'Ye are the salt of the earth.' I would not insist that man was actually salt…," William Jennings Bryan quoted in Jeffrey P. Moran, *The Scopes Trial*. (New York: Bedford/St. Martin's, 2002), p. 144.
[33] Numbers (1998), *Darwinism Comes to America*, p. 113.

We need to understand the reasons that people choose between rival sources of authority, and these reasons are shaped by larger social and political contexts. A richer, more rewarding, and ultimately more truthful account of Darwinian biology in America will pay attention to the incentives people have to accept what science says about the world and the way that political incentives in turn shape our understanding of science.

Evolution and Race: The Case of the United States

When *Origin of Species* was published in 1859 it entered an American political environment charged and splitting over race and slavery, as well as a political power structure premised on the racial inferiority of African slaves. Darwin's theory of evolution and the implication that all humans descended from a common ancestor significantly impacted theories of identity and race. Debates in America about the biological sciences were shaped by period debates about race, and evolution's legacy in America has been fundamentally influenced by nineteenth century America's most significant political division.

No one denies Maxwell's propositions about electromagnetism, though they are as important as Darwin's contributions to scientific thought. What people object to are scientific doctrines that buttress opposing political agendas. The politics of evolution reflected the political priorities of northern American naturalists, who themselves shared important political sympathies with Charles Darwin and the cadre of English naturalists around him. Like his family, Darwin's politics were typical for a mid-nineteenth century Gladstonian Liberal. On economics, he believed in free-trade, anti-unionism, and laissez-faire. On race and slavery, Darwin was fiercely anti-slavery and a relative racial egalitarian.

After 1860 the politics of evolution in England and America came to mirror these politics in important respects.

Though a scientific law contradicted biblical teaching nineteenth century Christians did not bother to object when there was no politically salient reason to do so. Darwin's theory of evolution *is* politically salient because it impacts our understanding of race. This is not to say that economic considerations were unimportant to the political reception of Darwin and Spencer in the United States; they were.[34] As in Great Britain, evolution was capable of providing justification for widely divergent economic theories. However, the economic dimension only formed one dimension of political analysis; race formed another.

The publication of the *Origin of Species* caused a scandal in England and in America, but countries such as England and France more quickly and more uniformly accepted the argument that evolution by means of natural selection described the natural history of life on Earth. This did not happen in America, because the American public had less trust in the objectivity of elite scientific opinion, especially when they found themselves in political disagreement with the scientists. America's racial divide shaped associated evolution with political controversy and decreased the chances for its dispassionate acceptance. I turn now to discuss how and why Darwinian evolution fed into broader political themes of race and identity, and how those debates, in turn, distorted the public reception to evolution.

[34] For example, Henry Demarest Lloyd railed against the "survival of the fittest" attitude amongst the business tycoons of his day, and attributed Darwinian ideas to gilded age capitalists. While the populist political economist Henry George, who favored state ownership of monopolies and argued that land belonged equally to all humanity used evolutionary arguments to justify his economic theories. Henry Demarest Lloyd, *Wealth against Commonwealth*. (New York and London: Harper & Brothers Publishers, 1894), p. 496. As for Henry George see most especially his last chapter in *Progress and Poverty* (1879), entitled "The Law of Human Progress." Alfred Russel Wallace, who independently formulated a theory of natural selection from Darwin, wrote to Darwin expressing admiration for George's *Progress and Poverty* and said that he had "never been so impressed with a book". Darwin replied that he would certainly order it himself. Quote appears in John Laurent, "Henry George: Evolutionary Economist?," in *Henry George's Legacy in Economic Thought*, ed. John Laurent (Edward Elgar Publishing, 2005), p. 73.

Science in America and Religion as Bulwark of Slavery

Perhaps ideally scientists should be insulated from social and political themes,[35] but of course they are not. In England and America, science emerged throughout the nineteenth century as an increasingly secular, independent, and professional source of political authority.[36] The increasing power to diagnose and solve social and political disputes gave science increasing political clout. Similar to church authority, scientific opinion lent credence and strength to political doctrines by providing leverage to shift political agendas. During the nineteenth century both religion and science were capable of serving as bulwarks to political authority, and both were, therefore, the subject of political dispute. Before the Civil War, Garrisonian abolitionists called for slavery's end without political compromise, and southern slave-owners became increasingly forthright in their defense of the southern social status quo. After 1830 debates over slavery made both scientific and religious authority more important politically, because both slavery's apologists and opponents appealed to these powerful sources of authority.

Both northern abolitionists and southern slave-owners used biblical interpretation to aid their claims to end or preserve slavery. Southern Methodists, Presbyterians, and Baptists formed distinct institutions that sublimated theology to the goal of protecting

[35] A good example of the prototypically ideal "scientific" personality of the late nineteenth/early twentieth century can be seen in the character of Max Gottlieb in Sinclair Lewis's novel *Arrowsmith* (1924). "…old Gottlieb! Ideal of research! Never bein' content with what *seems* true! Alone, not carin' a damn, square-toed as a captain on the bridge, working all night, getting to the bottom of things!" (New York: First Signet Classics Printing, 2008), p. 22.
[36] On the growing prestige of science see David A. Hollinger's, "Justification by Verification: The Scientific Challenge to the Moral Authority of Christianity in Modern America," in *Religion and Twentieth-Century American Life*, ed. Michael J. Lacey (New York: 1989) and Thomas L. Haskell, ed., *The Authority of Experts: Studies in History and Theory* (Bloomington: 1984).

slavery. There emerged in the South a proslavery mainstream. Scripture was appealed to in support of human slavery:

> The Bible served as the core of this defense. In the face of abolitionist claims that slavery violated principles of Christianity, southerners demonstrated with ever more elaborate detail that both Old and New Testaments sanctioned human bondage. God's Chosen People had been slaveholders; Christ had made no attack on the institution; his disciple Paul had demonstrated a commitment to maintaining it.[37]

Typical was the thought of John Henry Hammond, who argued that every civilization needed a "mud-sill" class, and that the southern system of human bondage organized necessary inequalities in accordance with principles of morality and Christianity. From the 1830s until after the Civil War, American political thought was largely defined by perspectives on slavery and race. In the south slavery's apologists used both religion and science to buttress their defense. In regards to slavery's apologists, Larry Edward Tise has said, "Prolavery thought was nothing more or less than thought about society."[38]

In both slave states and free, slavery served as a focal point around which institutions of religion, economics, and politics formed either to support or to oppose human slavery.

> In the course of the next decade, slavery's apologists would, in their collective oeuvre, develop a comprehensive defense of the peculiar institution that invoked the most important sources of authority in their intellectual culture and associated slavery with the fundamental values of their civilization.[39]

Religious denominations split along sectional lines and in the north, southern churches were seen as politically amenable to slavery. "Black and white abolitionists in the nineteenth century identified churches, in the words of James G. Birney, as 'the bulwarks of

[37] Faust, Drew Gilpin. *The Ideology of Slavery: Proslavery Thought in the Antebellum South, 1830-1860*. (Louisiana State University Press, 1981), p. 11
[38] Larry Edward Tise quoted in, Drew Gilpin Faust (1981), p. 2.
[39] Faust, Drew Gilpin. (1981), p. 10.

American slavery.'"[40] Attitudes toward market capitalism were also shaped by attitudes toward slavery. Many Jacksonian Democrats in the South were suspicious of market capitalism because they feared it would undermine slavery. If attitudes toward religion, economics, and politics were shaped by race and slavery it should not surprise us that attitudes towards science were, as well.

Before Darwin: Science in the American South

In the latter half of the nineteenth century, the American South did not have a reputation for scientific endeavor; in fact, only one southern naturalist was elected to the National Academy of Sciences before 1900.[41] This had not always been the case. Before 1859, natural history had had a stronghold in the American South, and there had been numerous scientific enterprises that sought to understand the place of human races in nature. The current perception that evolution is antithetical to southern thought is a product of an anachronistic view of the relationship between evolutionary biology and religion. In the first half of the nineteenth century, scientists played an important role in supporting the proslavery worldview.

> But for an age increasingly enamored of the vocabulary and methods of natural science, biblical guidance was not enough. The accepted foundations for truth were changing in European and American thought, as intellectuals sought to apply the

[40] Irons, Charles. *The Origins of Proslavery Christianity: White and Black Evangelicals in Colonial and Antebellum Virginia*. (Chapel Hill: The University of North Carolina Press, 2008), p. 1.

[41] Number of NAS naturalists—biologists, geologists, and anthropologists—by region, 1863-1900.

New England	30
Middle Atlantic	38
South	1
Midwest	7
West	2
Non-US	2

Table from Numbers (1998), p. 25-6.

> rigor of science to the study of society and morality, as well as the natural world. The proslavery argument accordingly called not only upon divine revelation, the traditional source and arbiter of truth, but sought at the same time to embrace the positivistic standards increasingly accepted for the assessment of all social problems.[42]

Before Darwin southerners used science to justify slavery and white racism even when scientific claims conflicted with biblical authority.

Whether human races were separate species or merely varieties produced by different climates was an important distinction for nineteenth century science, and science's verdict implicated politics. Today we often dismiss these enterprises as pseudoscience because of the racial assumptions their practitioners had. Nevertheless, phrenology, ethnology, and the debates between monogenists and polygenists operated according to contemporary scientific norms, and they were considered cutting-edge scientific work. Darwin's theory of evolution impacted these debates and changed the way scientists thought about race.

Phrenology

One scientific theory of race was phrenology. Phrenology was a physiognomic study of the relationship between personality and a skull's shape and contour. Early phrenology was a sort of "scientific horoscope" with mass appeal beyond American and English

[42] Faust, Drew Gilpin. (1981), p. 11.

scientific circles.[43] For many phrenology represented a real breakthrough because of its naturalistic interpretation of the mind.[44] Robert FitzRoy, Darwin's captain onboard the *Beagle*, was a follower of phrenology; "his own nose, of course, indicated leadership and intelligence."[45] The science of phrenology began by making claims about individual "characters", but it became a method to classify racial intelligence and personality based upon supposed statistics of shapes and sizes of the brains of various races. The classification of racial intelligence created a racial hierarchy (Europeans on top; Native Americans and Africans below). Politically, phrenology was used to demonstrate that the degradation of African slaves was compatible with their immutable nature. Charles Darwin encountered phrenology as a fad while at Edinburgh, but later at Cambridge he encountered opposition to this new "pseudo-science" and became convinced of its falsity.

The phrenologist Charles Caldwell (1772-1853), was a Kentucky slave-owner and a medical doctor, and in 1841 he traveled to England to present his theory that the black and white races were different species.[46] Caldwell's book *Thoughts on the Original Unity of the Human Race* (1830) was an attack on James Cowles Prichard's unity-of-the-human-species book, *Researches into the Physical History of Mankind* (1st edition, 1813). Anatomical study, said Caldwell, proved that Africans bore "a nearer resemblance to the higher Quadrumana than to the highest varieties of his own species."[47] Caldwell argued that science was the

[43] Phrenology inspired both academic scholarship, for example the *American Phrenological Journal* (published 1838-1911), as well as American entrepreneurialism. One product of phrenology's commercialization in the United States is the Automatic Electric Phrenometer, which can be viewed at The Museum of Questionable Medical Devices in St. Paul, Minnesota.
[44] Desmond, Adrian and James Moore. *Darwin's Sacred Cause: How a Hatred of Slavery Shaped Darwin's Views on Human Evolution*. (Boston and New York: Houghton Mifflin Harcourt, 2009), p. 31-37.
[45] Ibid., p. 70.
[46] Ibid., pp. 152-154.
[47] 'Notices and Abstracts of Communications', etc., 75, in *Report of the Eleventh Meeting of the British Association for the Advancement of Science…1841* (London: John Murray, 1842).

proper venue for the common origins of mankind not revelation. In fact Caldwell called the Word of God spoken through the study of the natural world the "Elder Revelation".

Another American phrenologist was Samuel George Morton (1799-1851). Morton was the founder of invertebrate paleontology in America and the most famous anthropologist of his day. Morton classified skull variations by race, and although we now know that his data were unsound[48] he was cited as authoritative by scientists in Europe and America. Morton's phrenological work influenced Louis Agassiz, nineteenth century America's most famous naturalist and Darwinism's most important American opponent after 1859. Before arriving in the United States and visiting with Morton in 1846, Agassiz believed in the unity of the human species, but Morton's data convinced Agassiz otherwise. According to Jules Marcou, Agassiz's disciple and biographer, after Georges Cuvier no zoologist had more influence on Agassiz.[49]

Polygeny: The American School of Anthropology

Phrenology fed a longstanding scientific debate on the question of whether human races were separate species or mere varieties.[50] J. F. Blumenbach divided humans into five essential races, while Immanuel Kant thought there were just four.[51] It was an important distinction for the species was a divinely created unit made "in the beginning," while varieties were merely the product of environmental circumstance. In 1792 the American

[48] Gould, Stephen Jay. "Morton's Ranking of Races by Cranial Capacity," in *Science*, Vol. 200 (5 May 1978), pp. 503-509.
[49] Marcou, Jules. *Life, Letters, and Works of Louis Agassiz*, vol 2. (New York: Macmillan and Co., 1896), p. 29.
[50] See, for example, the debate between pluralists and unitarists in the Charleston, South Carolina's *Southern Quarterly Review*, VII (1845).
[51] Blumenbach, J. F. "On the natural variety of mankind (3rd ed.) in *The Anthropological Treatises of Johann Friederich Blumenbach*. Thomas Bendyshe, ed. and tr. (London: 1865), pp. 146-276; and Kant, Immanuel. "On the Different Races of Man," in *Race and the Enlightenment: a Reader*, edited by Emmanuel Chukwudi Eze (Wiley-Blackwell, 1997).

anti-slavery campaigner Benjamin Rush argued that the human species was unitary and that black skin was caused by leprosy (thus a mere medical condition), and not proof of diverse human species. Rush went on to say that if this was true then "all the claims of superiority of the whites over the blacks, on account of their color, are founded in ignorance and inhumanity."[52] Such scientific and philosophical distinctions played a role in European ideas about the rights and duties owed to people encountered in the New World as well as the Africans enslaved there.[53]

In the first half of the nineteenth century, James Cowles Prichard was the outstanding spokesperson for the unity school of the human species, otherwise known as monogeny. The 1836 edition of Prichard's book, *Researches Into the Physical History of Mankind*, was written in order to combat the pluralists (polygenists), who maintained that blacks were a different species than whites. Prichard recognized the social and political debates into which the unity/plurality or monogeny/polygeny debates fed.[54] Darwin thought highly of Prichard's work and would become, like Prichard, a future adversary of the polygenist worldview. Though inconsistent with the Genesis account of human creation, polygeny had widespread support in the slave states. In fact the polygenist account became influential enough and dominant enough to be called the "American School of Anthropology."

In Mobile, Alabama, Josiah Nott became the most important proponent of polygeny. Morton's work provided Nott with empirical firepower, and in 1844 Nott published *Two*

[52] Rush, Benjamin. "Observations Intended to Favor a Supposition That the Black Color (As It Is Called) of the Negroes is Derived from the LEPROSY," in *Transactions of the American Philosophical Society*, Vol. 4 (1799), 295.
[53] See John C. Greene's "Some Early Speculations on the Origin of Human Races," in *American Anthropologist*, New Series, Vol. 56, No. 1 (Feb., 1954), pp. 31-41.
[54] Edward Lurie, "Louis Agassiz and the Races of Man," in *Isis*, Vol. 45, No. 3. (Sep., 1954), pp. 228.

Lectures on the Natural History of the Caucasian and Negro Races. Nott viewed himself as first and foremost a scientist, and though he sprinkled his work with protestations of devotion to "sacred truth", Nott saw his work as a bit of a crusade against religion.[55] Nott maintained that scientific and religious truth could be unified and he blamed inconsistencies on fallible clergy interpreters.[56] Nott worked with George Gliddon, an Englishman who had served as the American vice-consul in Cairo, a position in which Gliddon was able to provide Morton with Egyptian specimens for his phrenological research. After Morton died, Nott and Gliddon began the project of making "Morton's research the basis for authoritative work of racial science. Through their efforts polygenism became known as the American school of anthropology."[57] Nott and Gliddon cultivated Louis Agassiz and Agassiz came around to their perspective. On a visit of Agassiz's to a southern plantation near Charleston in 1850, Agassiz interviewed slaves there and claimed "these races must have originated where they occur…Men must have originated in nations, as the bees have originated in swarms."[58]

Agassiz was bit of a hero to southerners and after 1859 became the most important scientific opponent of Darwinism in America. Agassiz was a polygenist and a visceral racist. Agassiz described his shock upon being served by black waiters at a Philadelphia hotel: "I could not tear my eyes away from their appearance in order to tell them to keep their distance. And when they put their hideous hand on my plate in order to serve me, I

[55] Ibid., p. 110.
[56] See, for example, Nott's *Two Lectures on the Connection Between the Biblical and Physical History of Man* (1849; reprint ed., New York: Negro Universities Press, 1969).
[57] Menand. (2001), p. 111.
[58] Agassiz, Louis. "The Diversity of Origin of the Human Races," in *Christian Examiner*, Vol. 49, (1850), p. 125m 128,

wished I were able to distance myself in order to eat my morsel of bread elsewhere…"[59] Upon first seeing black waiters, Agassiz suspected that blacks and whites were not of the same species, and the work of Nott and Gliddon confirmed this suspicion.[60] As we shall see, Agassiz believed in the fixity of species in part because he objected to the implied familial relationship between all humans.

The southern physician, Samuel Cartwright popularized the work of the American school of Anthropology and made it his goal to make polygenism compatible with the Genesis account of creation by claiming that there had been *two* creations. Blacks had been created with the animals, while whites were the descendents of the creation of Adam and Eve. Cartwright saw the importance of the political side of the polygenist/monogenist debate, and he argued in a leading southern journal, *De Bow's Review* that "the abolition delusion is founded upon the error of using the word *man* in a generic sense, instead of restricting it to its primary specific sense."[61]

Polygeny proved difficult to square with Genesis, and ministers challenged polygenist science for that reason.[62] One challenger was John Bachman, a Lutheran pastor who ministered to African-American slaves, and who also wrote the anti-Morton book *Doctrine of the Unity of the Human Race* in 1850. Bachman argued that racial variation was merely contingent on environmental circumstance. Darwin read Bachman's work, and it influenced his theory of evolution. Bachman invoked the principles of science as well as

[59] Quoted in Desmond and Moore (2009), p. 232-3.
[60] Lurie, Edward. *Louis Agassiz: A Life in Science*. (Baltimore: Johns Hopkins University Press, 1988), p. 256-7.
[61] Cartwright, Samuel A. "Unity of the Human Races Disproved by the Hebrew Bible," in *De Bow's Review*, Vol. 29 (1860), pp. 130-131.
[62] For example, Moses Ashley Curtis's "The Unity of the Races," in the *Southern Quarterly Review*, VII (1845), pp. 372-448.

religion in his defense of unitary origins, and he viewed the polygenists as anti-clerical and anti-religious.

> Gliddon's cat-calling was worst, especially when he ended up calling the Bible a 'fetiche'….This was guaranteed to leave a minister like Bachman shaking, but then he was one of Gliddon's 'biblical dunces'. *Types of Mankind* was rank blasphemy to Bachman: irresponsible science unconstrained by a better Book.[63]

Ironically, before Darwin effectively ended the scientific debate on polygeny, rendering it unavailable for slavery's defense, it was unitarists, like Darwin, who were aligned with clerics, like Bachman, *defending* the Genesis account. For some the best defense of the theory of human unity was the common descent in Darwin's evolutionary theory. The geologist Charles Lyell claimed that "it was believers in Genesis…who 'led towards C. Darwin'."[64]

Southern politicians used polygenist arguments to defend slavery. Josiah Nott claimed that South Carolina Senator John C. Calhoun was a convinced pluralist and had used polygenist science in his 1844 negotiations with England and France over the annexation of Texas to assert that scientific authority backed slavery.[65] To prepare for the negotiations, Calhoun studied the science of racial types. "[Calhoun] was convinced that the true difficulties of the subject could not be fully comprehended without first considering the radical difference of humanity's races, which he intended to discuss…"[66] Pro-slavery politicians John Henry Hammond, Alexander H. Stephens, Robert Toombs, and Robert B. Rhett all adopted the scientific argument for the permanent fixity of racial types

[63] Desmond and Moore. (2009), p. 263.
[64] Ibid., p. 270.
[65] Nott and Gliddon (1855), pp. 50-52.
[66] Ibid., p. 51.

to defend slavery.[67] As it would be in apartheid South Africa, antievolutionism was part of an orthodoxy that stressed fixed racial privileges and norms.[68] After 1859 it became difficult to make a scientifically credible argument in favor of polygeny.

Polygeny was an attempt to define whites and blacks as separate species to the detriment of blacks, and "the net result of such labors was to supply a 'scientific' basis for a theory of racial inequality."[69] Certain inalienable rights derived from one's humanity were denied to slaves and polygeny provided a justification. As Drew Gilpin Faust puts it, "nature produced individuals strikingly unequal in both qualities and circumstances. "Scientific" truths demonstrated through empirical study prescribed a hierarchically structured society reproducing nature's orderly differentiations."[70] The subjugation of Africans was easier if black slaves were not the same species as Europeans, especially within the American political context. For example "polygenism was cited in support of the view that slavery did not violate the spirit of the Declaration of Independence, on grounds that Jefferson's

[67] Lurie (1954), Note 66.
[68] It is interesting to note that ruling whites in South Africa resisted the teaching of evolution. Evolution was seen as politically inconsistent with the doctrines of the ruling Christian National party's pro-Apartheid stance. South African students were taught the CN perspective through curriculum which omitted 'anti-biblical' concepts like evolution. South African whites were taught a version of history which, "omitted, distorted or vilified the role of blacks, 'coloureds' and Asians in the country's past". (Dean, J. & Sieborger, R. "After Apartheid: the outlook for history," in *Teaching History*, Vol. 79 (1995), pp. 35-38) The post-apartheid ANC has altered the curriculum to "rid the education and training system of a legacy of racism, dogmatism, and outmoded teaching practices." (African National Congress. *A Policy Framework for Education and Training*. (Johannesburg: 1994), pp. 10-11) One of the steps they have taken to modify the curriculum has been to introduce human evolution to history classes for the first time. Students recognized the racial component to evolution right away. "For black children, for example, the issue of whether early humans were black or white was of importance. The concept of a single ancestor was significant. They enjoyed the fact that 'blacks and white people are from the same person' (Moira Mabuya, Grade 5), and that skin colour is simply an adaptation to environmental conditions: 'I learned that we a one human being child, our skin changes from the wether' (Cynthia, Grade 5)." (Esterhuysen, Amanda; Jeannette Smith. "Evolution: 'the forbidden word'?, in *South African Archaeological Bulletin*, Vol. 53 (1998), pp. 135-137).
[69] Lurie, Edward. "Louis Agassiz and the Races of Man," in *Isis*, Vol. 45, No. 3. (Sep., 1954), pp. 230.
[70] Faust, Drew Gilpin. *Southern Stories: Slaveholders in Peace and War*. (University of Missouri Press, 1992), pp. 80-81.

term "all men" did not, scientifically, mean blacks."[71] The definition of human identity and the rights derived there from are intimately tied.[72]

Charles Darwin felt strongly about slavery, in fact it is better to say that he was fiercely anti-slavery.[73] While traveling in South America, Darwin witnessed the brutal treatment meted out to slaves and recoiled. Darwin nearly lost his position on the ship after arguing with Captain FitzRoy over slavery.[74] In a letter home he wrote:

> How steadily the general feeling, as shown at elections, has been rising against Slavery. What a proud thing for England if she is the first European nation which utterly abolishes it! I was told before leaving England that after living in slave countries all my opinions would be altered; the only alteration I am aware of is forming a much higher estimate of the negro character.[75]

His feelings were strong and life-long. In 1865 after the suppression of the Morant Bay rebellion (400 blacks executed, 600 flogged, 1000 suspect houses razed) by Governor Eyre of Jamaica, Darwin joined the Jamaica Committee along with Alfred Russel Wallace, Charles Lyell, Huxley, Herbert Spencer, and other anti-slavery radicals and liberal politicians to prosecute Eyre. Darwin's hatred of slavery colored his appreciation of the animal life he would make his life's study. "Animals—whom we have made our slaves we do not like to consider our equals. Do not slave holders wish to make the black man other kind?"[76]

By 1875 nearly all American scientists accepted Darwinian evolution and a unitary theory of human origins. From 1860-1890, Darwinists in the United States were nearly all northerners and antislavery, and most commonly Republicans. Support for Republican

---

[71] Menand, Louis. *The Metaphysical Club: A Story of Ideas in America*. (New York: Farrar, Straus and Giroux, 2001), p. 112.
[72] On the difficulties of incorporating nonhuman species into a liberal polity see Martha Nussbaum's *Frontiers of Justice: Disability*, *Nationality*, *Species Membership*. (Harvard University Press, 2006).
[73] Desmond and Moore (2009).
[74] Darwin (1839), *Voyage of the Beagle*, p. 74.
[75] Darwin, Francis, ed. *The Life and Letters of Charles Darwin, including an Autobiographical Chapter*, 3 vols. (Murray, 1887), p. 246.
[76] Quoted in Desmond (1989), p. 407.

politics amongst white southerners was minimal. Northern carpetbaggers and radical Republicans were recreating the power structure in the South and Darwinian science was associated with racial egalitarianism, and the implication that race was contingent variety rather than fixed specie politicized southern reaction to evolution.

Darwin in America

Evolutionary ideas before Darwin were predominately Lamarckian, which was consistent with polygenist natural history. Lamarckian evolution held that human races did not share a common ancestry, but this version of evolution was supplanted after 1859. As this happened the politics of evolution in the United States, as in England, came to mirror the politics of Charles Darwin and those closest to him. Once again we see that Darwin's impact was not in introducing the world to evolution, but rather in doing it so well that he was able to take evolution out of the service of some and place it in the hands of those who matched his views on race and slavery.

Darwin's theory necessitated a common creation, or as Darwin put it in *Descent of Man*, "all the races of man are descended from a single primitive stock."[77] American scientists rapidly accepted evolution, but one exception was Louis Agassiz. Agassiz objected to Darwinism and to the politics of the abolitionists that used Darwinism. When the Civil War began, Agassiz claimed that abolitionists would "Mexicanize the country," by allowing racial intermarriage.

> Conceive for a moment the difference it would make in future ages for the prospect of republican institutions and our civilization generally, if instead of the manly population descended from cognate nations, the United States should hereafter be

[77] Darwin discusses the polygenist/monogenist debate in Chapter VII, Part I of the *Descent of Man*. Quote from the Norton edition (2006), p. 907.

> inhabited by the effeminate progeny of mixed races, half Indian, half negro, sprinkled with white blood.[78]

After Darwin evolution became associated with northern industrialists, monogenists, abolitionists, and racial egalitarians. Carl Schurz, for example, combined a belief in Darwinian evolution with his political beliefs. Schurz was antislavery and a Spencerian. He was also a monogenist, free trader, and a northern general during the Civil War. Schurz identified the ideals of Darwin and Spencer with northern politics. Schurz claimed that if southerners had read Spencer, "there would never have been any war for the preservation of slavery."[79] The northern preacher Henry Ward Beecher was an abolitionist, a proponent of capitalism, and an evolutionist. Beecher fought for slaves' freedom and helped to finance John Brown's insurrection in Kansas; Brown's rifles were called "Beecher Bibles." Herbert Spencer's American promoter, Edward Youmans, believed Beecher might lead American clergy to accept the doctrine of evolution.

Yale's James Dwight Dana was a friend to Agassiz but an opponent to slavery. Darwin successfully cultivated Dana to evolution, in part by appealing to their shared anti-slavery views.[80] The most famous defender of Darwin in America was Louis Agassiz's colleague at Harvard, Asa Gray. Gray was a botany professor and an orthodox Christian, and in his person he demonstrates the non-necessity of science-religion conflict, because Gray sought to bridge the gap between religion and science on the question of human origins. Gray was one of a number of American scientists, including Benjamin Silliman, Edward Hitchcock, and Dana, who believed that evolution did not contradict the scriptural

[78] Louis Agassiz to Samuel Gridley Howe, August 10, 1863, autograph copy, Agassiz Papers (152). Quoted in Menand (2001).
[79] Werth (2009), p. 284.
[80] Desmond and Moore (2009), pp. 276-79.

accounts in Genesis of human origins.[81] Gray was also anti-slavery and he realized what Darwin's theory meant for questions of race. In Gray's 1860 *Atlantic Monthly* review of *Origin of Species*, Gray knew that Darwinian evolution would spell the death knell of the scientific theory of human pluralism. Evolution meant that humankind was one family, and that as one travels back along the family tree,

> the lines converge as they recede into the geological ages, and point to conclusions which, upon the theory, are inevitable, but by no means welcome. The very first step backwards makes the Negro and the Hottentot our blood-relations; — not that reason or Scripture objects to that, though pride may.[82]

At this time the dividing line was not between science and religion, but between north and south. The ideology of slavery was supported in the South by the biblical story of Ham's curse, as well as the scientific theory of plural human origins.

The end of the era of Reconstruction meant the hardening of new, powerful racial lines in the southern United States reified in Jim Crow and practice of segregation. To some degree racial politics were tempered as the United States refocused on alternative political priorities. Anti-evolutionism died down after the end of reconstruction at the same time as these racial upheavals quieted. During the waves of immigration in the early part of the twentieth century, racial boundaries reemerged as politically potent, and during this time antievolutionism reemerged as a political force in the figure of William Jennings Bryan and the Scopes Trial. And again during challenges to southern segregation in the 1950s and 1960s, southern fundamentalists reemerged to condemn the moral depravities of Darwinism.

---

[81] Howe (2007), p. 465-6.
[82] Gray, Asa. "Darwin on the Origin of Species," in *The Atlantic Monthly*, (July 1860).

In 1965, a young woman named Susan Epperson tested Arkansas's law against the teaching of evolution in her position as biology teacher at Little Rock's Central High School, the very school in which the 101st airborne had escorted "The Little Rock Nine" to class in order to protect them from angry white mobs. Locals considered Epperson the equivalent of an intellectual carpetbagger, and she received threats linking the teaching of evolution with the politics of race. "If…cocoanut-heads up there want to believe there forefathers are monkeys, apes or gorillas, its OK, but don't let them shove it down our throat like Johnson did the Civil Rights law…"[83]

Darwin's theory highlighted antislavery and race as environmental contingency, and Darwinist scientists were overwhelmingly antislavery and were less determined to perpetuate a political structure premised on racial inequality. By demonstrating the nonfixity of human races, evolution implies that the politics of race might be arbitrary rather than God-given. In moments when identity politics are shifting and white supremacy is being challenged, antievolutionism reasserts itself. The politicization of natural history in America has lowered the public's trust in the authority of the biological sciences, and it has heightened the fears of the political costs implied by an evolutionary reevaluation of racial identity. Southerners, in particular, have reacted to the politics of evolution by deemphasizing the authority of science and have chosen to assert the right to local control of politics and society. The antievolutionist argument for state's rights and local autonomy has mimicked the language used by southern senators to protect slavery or resist African-American voting rights. Darwinian evolution and antievolution have always been political phenomena, but this was no less true of pre-Darwinian conceptions of the

[83] Quoted in Randy Moore's, "Racism and the Public's Perception of Evolution," in *Reports of the National Center for Science Education*. Vol. 22, No. 3 (May-June, 2002), pp. 16-18, 23-25.

'Great Chain of Being' and polygeny. Our conception of rights, duties, and even the nature of 'the political' is dependent upon our understanding of the boundaries of human identity. As long as the politics of race is important in the United States the racial implications of Darwinian evolution will matter. As W. E. B. DuBois said in 1925 during the Scopes trial:

> The folk who leave white Tennessee in blank and ridiculous ignorance of what science has taught the world since 1859 are the same ones who would leave black Tennessee and black America with just as little education as is consistent with fairly efficient labor and reasonable contentment…who permit lynching and make bastardy legal in order to render their race "pure".[84]

The history of evolution has been particularly disruptive and contentious in America because evolution has something profound to say about human identity and "who we are."

In the United States, evolutionary biology proved useful to a particular political side but not to the other. The expert knowledge of scientists might have served as a mutually agreed upon source of objective, technical facts about the biological nature of race, to which political discussion could refer. However, since evolutionary scientists seemed to support the abolitionist/racial egalitarians scientific expertise ceased to be viewed as neutral arbiter but rather as partisan. It was the political applicability of evolutionary science that damaged the perceived neutrality upon which its epistemic authority was based.

[84] DuBois, W. E. B. "Scopes," in *The Crisis*, Vol. 30 (Sept., 1925), p. 218.