

## Science, Religion, and A. D. White: Seeking Peace in the “Warfare Between Science and Theology”

BY MARK NOLL

*A somewhat abridged version of this essay was originally presented as the 2009 Frederick C. Wood Lecture at Cornell University. A video of the presentation can be found [here](#).*

As a historian who has long pondered the controversies in recent Western history involving religion and science, I am naturally much interested in the founding president and inspirational genius of Cornell University, Andrew Dickson White. In this paper I will spend a fair amount of time on White and the historical circumstances surrounding the founding of Cornell, but this effort is meant to advance a general thesis. To express that thesis, I will shamelessly paraphrase the opening line of Steven Shapin’s wonderful little book, The Scientific Revolution: **there has never been such a thing as warfare between Science and Theology, and this is a paper about it.**

Andrew Dickson White was a man of many parts. Besides working energetically with Ezra Cornell to use the fortune Cornell had amassed in the telegraph business to build their new university; besides taking on several substantial political tasks for the state of New York; besides filling U.S. diplomatic posts in Santo Domingo, Germany, and Russia; besides shouldering many duties as reformer and public advocate—besides all this, White was an indefatigable historical researcher and a tireless writer. As a scholar and author, White doggedly pursued a single theme. For nearly three full decades, at random moments snatched from the crushing pace of his official duties, White researched, wrote, researched, and wrote some more—but always in service to one grand historical argument. The argument received its first full statement in a lecture delivered at the Cooper’s Union in New York City on December 18, 1869, which was then printed the next day in Horace Greeley’s New York Tribune. It was a bold statement, asserted bluntly: “In all modern history, interference with science in the supposed interest of religion, no matter how conscientious such interference may have been, has resulted in the direst evils both to religion and to science, and invariably; and, on the other hand, all untrammelled scientific investigation, no matter how dangerous to religion some of its stages may have seemed for the time to be, has invariably resulted in the highest good both of religion and of science” (viii).<sup>1</sup> For the next thirty years, White exploited the travel necessitated by his official duties to gather vast quantities of evidence in support of this argument—as he put it, “in the New World, from Quebec to Santo Domingo and from Boston to Mexico, San Francisco, and Seattle, and in the Old World from Trondhjem to Cairo and from St. Petersburg to Palermo.” And as he researched, so he wrote—“sometimes on an Atlantic steamer, sometimes on a Nile boat, and not only in my own library at Cornell, but in those of Berlin, Helsingfors, Munich, Florence, and the British Museum” (x). The result of these continuous labors was a short book in 1876 titled The Warfare of Science; then an expanding series of articles published in magazines like The Popular Science Monthly; and finally in 1896 a 900-page, two-volume brickbat of a tome titled A History of the Warfare of Science with Theology in Christendom.

Between White’s first lecture in 1869 and the publication of his full statement in 1896, others had also taken up the cry. White knew well the work of John W. Draper, an English-born, New York City chemist, who in 1874 had published a widely noticed study entitled The Conflict between Science and Religion; moreover, White considered Draper’s book “a work of great ability” (ix). Still, White persevered in his own parallel research because, as he put it frankly, “I had become deeply interested in the subject” and did not want to give it up. More substantially, White also wanted to make one critical adjustment to Draper’s argument. For White, the critical conflict was not between “Science and Religion,” as it was for Draper; rather, White held that the critical conflict lay between “Science and Dogmatic Theology” (ix).

White’s 1896 volume spelled out what he meant by the difference between “Religion” and “Dogmatic Theology.” This differentiation enabled him, as he came to the end of his second volume, to move from describing Warfare to predicting a Peace. In White’s picture, “the atmosphere of thought engendered by the development of

all sciences during the last three centuries” had enjoyed a tremendous success in dissolving what he called “vast masses of myth, legend, marvel, and dogmatic assertion” (2:393). Because of what “all these sciences” (2:394) had achieved, White confidently concluded that “accounts formerly supposed to be special revelations to Jews and Christians [were] but repetitions of widespread legends dating from earlier civilizations, and . . . simply based on ancient myths.” These legends and myths were what White called Dogmatic Theology. But with such Theology swept away, White was confident that a purified form of Religion would flourish. Because of what “modern science in general” had achieved, and especially “the evolution doctrines which have grown out of the thought and work of men like Darwin and Spencer,” White thought he was witnessing in his own day “the most striking evolution of morals and religion in the history of our race” (2:394). With Dogmatic Theology ousted by the labors of modern science, White held that “the world at large” was moving from a place where belief in “tribal god[s]” provoked “every sort of cruelty and injustice” to a new conception of humanity as “a vast community in which the fatherhood of God overarches all, and the brotherhood of man permeates all” (2:395). More clearly than Draper, White held that since Science had dethroned Dogmatic Theology, Religion of a beneficent sort would prevail, and unprecedented moral progress would occur.

A. D. White remains a consequential figure in Western intellectual history, but not for his prediction that Religion, stripped of Dogmatic Theology, would join with scientific progress to usher in a golden age of universal human flourishing under a benignly accommodating deity. Like so many other prophecies of the millennium, White’s vision of the future represented the triumph of hope over experience.

Rather, White remains important for the controlling metaphor of his great historical work. That image is of warfare. In his rendering, a progressive, ameliorative, and authoritative capital-S Science had for centuries been locked in perpetual combat with a regressive, cramped, and deluded capital-T Dogmatic Theology. Only in the years of White’s own life had the tide of battle turned decisively in favor of science, against Dogmatic Theology, and with multiplying benefits for all.

The staying power of White’s image has been extraordinary. Its continuing force can be illustrated by widespread reactions to current events like law suits over the teaching of evolution in public schools, or widely-publicized books denouncing traditional religion as a superstitious relic of barbarism, or debates concerning the use of embryonic stem cells for research. The power of the warfare metaphor persists strongly in some religious communities that equate “evolution” with “atheism.” The metaphor seems almost as powerful in some academic communities that equate “Bible believing” with “anti-science fanaticism.” Whenever we react, upon hearing of such matters, by thinking—“here we go again”—or, more tellingly, if we instinctively lapse into cheerleader mode and hope that “our side” in these controversies “wins,” we testify to how pervasively White’s depiction of warfare between Science and Theology has taken hold.

White’s reconstruction of the past was fundamentally mistaken. In point of fact, his metaphor of warfare grossly oversimplified the actual relationship between Science and Dogmatic Theology. Before, during, and after the time he was writing his landmark book, relationships involving science and religion have rarely amounted to warfare.

This judgment comes from my standpoint as a Christian believer of a traditional type. By traditional, in this context I mean Christianity defined as straightforward belief in the propositions of the Apostles’ Creed and the Nicene Creed. And for the sake of simplicity, this discussion is limited to western Science in relationship to Christian Dogmatic Theology, though it is my impression that similar perspectives could be offered by traditional Muslim believers and traditional Jewish believers as well. My first argument is that for patent historical and philosophical reasons, it is nonsensical to speak about a condition of warfare between Science and Dogmatic Theology.

But I also hope to develop a second argument: despite being wrong in the conclusions he drew from his research, A. D. White’s big book nonetheless made a genuine contribution to a better understanding of religion and science. That contribution came directly from the very last word of his title—again, *A History of the Warfare of Science with Theology in Christendom*. “Christendom,” I hope to suggest, offers much better insight for White’s theme than his trope of warfare. With his reference to “Christendom,” White explained why, though in fact there

has never been a state of war between Science and Dogmatic Theology, incidents of conflict and the perception of conflict appear everywhere in Western history. So my second task is to isolate some of the factors that have made for the continuous appearance of struggle between Science and Theology.

Before developing these arguments, however, it would be well to set out, quite briefly, how White developed his own position. Throughout his book, he referred continually to “the theological view” and “the scientific view” (e.g., 1:183), or “the theological and the scientific doctrine” (1:171) or “the naturally opposing tendencies of theology and science” (1:41). On the theological side stood a disdain for observation and empirical methods combined with a commitment to authority, tradition, and a literal interpretation of the Bible. Early in his exposition, White illustrated the self-defeating effects of these characteristics by describing the retrograde understanding of the animal kingdom that prevailed during the middle ages: “Neglecting the wonders which the dissection of the commonest animals would have afforded them, these naturalists attempted to throw light into Nature by ingenious use of scriptural texts, by research among the lives of the saints, and by the plentiful application of metaphysics” (1:33). To the rescue of such hopelessly misguided efforts eventually came “one after the other, five of the greatest men our race has produced—Copernicus, Kepler, Galileo, Descartes, and Newton—and when their work was done the old theological conception of the universe was gone” (1:15). In White’s account, each of these great scientists insisted upon privileging direct observation over inherited authority; each refused to be bound by traditional literal interpretations of Scripture; each courageously thought for himself instead of heeding the concerns of intellectually timid ecclesiastical officials; each showed how “all-pervading law” (1:15) provided a vastly superior account of the physical world than reference to capricious divine action; and each valued truth more than the reputation of the church.

Unlike John W. Draper, whose book offered an unremitting barrage of anti-Catholic polemic, White frequently pointed out that when Protestantism came along, some of its major figures were just as destructively opposed to modern science as the most benighted authorities of the middle ages or in the modern Catholic Church. Yet White’s account of the judicial case against Galileo in 1615-1616, which ended by reaffirming the Catholic church’s traditional stance of a non-rotating world positioned at the center of the universe, was particularly graphic:

*The whole struggle to crush Galileo and to save him would be amusing were it not so fraught with evil. There were intrigues and counter-intrigues, plots and counter-plots, lying and spying; and in the thickest of this seething, squabbling, screaming mass of priests, bishops, archbishops, and cardinals, appear two popes, Paul V and Urban VIII. It is most suggestive to see in this crisis of the Church . . . on the eve of the greatest errors in Church policy the world has known, in all the intrigues and deliberations of these consecrated leaders of the Church, no more evidence of the guidance or presence of the Holy Spirit than in a caucus of New York politicians at Tammany Hall (1:136-37).*

Despite this temporary defeat of Science by Dogmatic Theology, however, the upward arc of untrammelled truth eventually prevailed. Most of White’s chapters took the form of showing how the various scientific disciplines and other schools of modern inquiry were liberated when intellectually decrepit Theology gave way to intellectually vibrant Science. And so we have chapters entitled “From Creation to Evolution,” “From Magic to Chemistry and Physics,” “From Miracles to Medicine,” “From the Divine Oracles to the Higher Criticism,” and so on. In each chapter, Dogmatic Theology is the culprit, Science is the hero.

A stunning array of solidly grounded reasons indicates why White was simply wrong in how he told his story. The sixteen reasons that follow have been driven home so often by so many scholars that the really puzzling historical problem is how any credibility at all still clings to the notion of warfare between Science and Theology.<sup>2</sup> So, why is it simply mistaken to credit A. D. White’s notion of warfare between Science and Theology? Here is a bulging catalogue of reasons.

(1) Runaway Essentialism. There is not and never has been an abstract Science and an abstract Dogmatic Theology locked in mortal conflict. Disagreements of all kinds involving many aspects of religion and theology have certainly taken place; but such instances are very far from constituting an essentialist conflict between an essentialized Science and an essentialized Theology.

(2) The Origins of Modern Science. Beginning even in White's own day, an array of learned scholars have shown how particular aspects of traditional Christianity—even medieval Christianity—played critical parts in the rise of modern natural science. While the scholars differ considerably in highlighting the aspects of Christianity that encouraged modern science and how that encouragement functioned, the work of Michael Foster, Alfred North Whitehead, Robert Merton, Charles Webster, Reijer Hooykaas, Stanley Jaki, and many others have shown how important various aspects of dogmatic thinking were to Western scientific advance.

(3) Accommodating Theologies. From the side of theology, classical Christian traditions have stressed main theological principles that make room for modern science. These same principles can be construed as supporting modern scientific conventions that are often thought to conflict with traditional Christian theology. The two main traditions that easily accommodate modern science are the Thomistic and the Calvinistic. In both Thomas Aquinas and John Calvin are found doctrines of divine creation that entail a domain of natural existence for which the ordinary human senses offer the proper means to understand the workings of the natural domain. And in both Thomas Aquinas and John Calvin are found doctrines of providence that easily (repeat, easily) accommodate theories of randomness that have become essential in modern evolutionary biology.<sup>3</sup>

(4) White's Big Five. A. D. White highlighted the work of Nicholas Copernicus, Johannes Kepler, Galileo Galilei, René Descartes, and Sir Isaac Newton as critical in the triumph of Science over Theology. In fact, as more than a century of careful historical work has demonstrated, all five of these pioneering early modern scientists were traditional Christian believers of one sort or another. Much as all five engaged in controversy with various church officials, none of them believed that their scientific work undermined what they considered the main affirmations of historical Christian faith.

(5) The Galileo Affair. Galileo certainly battled the pope and church officials in defending the heliocentric view of the universe. But the words of a recent student summing up the best current scholarship shows that this episode defines something quite different from the warfare that A. D. White perceived:

*[Galileo] objected not to the right of the church to enter the cosmological debate, but rather to the position it adopted in that debate. In short, examined in seventeenth-century terms, the outcome of the Galileo affair was a product not of dogmatism or intolerance beyond the norm, but of a combination of more or less standard (for the seventeenth century) bureaucratic procedure, plausible (if ultimately flawed) political judgment, and a familiar array of human foibles and failings.<sup>4</sup>*

(6) Johannes Kepler. Kepler, the great systematizer of planetary motion, also had his difficulties with church officials—in his case, Lutheran and Calvinist as well as Catholic. But as described by one expert on his life, “in Kepler's religious thought Christianity remained intact, harmoniously interwoven with his science and scarcely altered by it.”<sup>5</sup>

(7) Sir Isaac Newton. In a long life of intense theological effort that accompanied his intense theological efforts, Newton did question the traditional Christian doctrine of the Trinity. But an expert assessment published recently presents a very different picture than found in A. D. White's volume:

*Copious writings that he labored over for decades and kept secret . . . show a new Newton who was no deist, no rationalist, and not much of a Newtonian mechanist either. With a profound sense of Providence at work in history, Newton never espoused the view of a remote and uninvolved Creator God that his scientific work sometimes inspired in others.<sup>6</sup>*

(8) Charles Darwin. A. D. White made much of Darwin's theory of evolution as breaking the paralyzing grip of Dogmatic Theology, but the actual unfolding of Darwin's life was much more complicated. As outstanding historical reconstruction has shown, Darwin became an agnostic not because of his scientific researches, but because of the moral trauma he experienced at the untimely death of his favorite daughter.<sup>7</sup> In addition, one of the finest books to appear in 2009 marking the bicentennial of Darwin's birth makes a surprising argument about Darwin's willingness to publish The Descent of Man in 1871 (this was the book where Darwin proposed that humankind was included in the evolutionary descent of all life from one primeval origin). The claim of Adrian Desmond and James Moore's Darwin's Sacred Cause is that the naturalist published his findings as much to promote an ethical principle concerning the unity of the human race as for narrowly scientific reasons.<sup>8</sup>

(9) Huxley and Wilberforce. A. D. White wrote several pages on the momentous significance of an exchange in 1860 between Thomas Huxley, "Darwin's Bulldog," and the Bishop of Oxford, Samuel Wilberforce, which showed Wilberforce twisting scientific evidence to deny the force of evolution and Huxley defending the high truths of unfettered scientific investigation (1:70-71). The problem with this account is that, though some kind of exchange doubtless took place in Oxford before the British Association on June 30, 1860, no one at the time ascribed much significance to it at all. The conclusion that the Huxley-Wilberforce exchange was one of the turning points in the battle between Science over Theology turns out itself to be a myth.<sup>9</sup>

(10) Promoting Darwinism. A. D. White included brief mention of the Harvard botanist, Asa Gray, in his Warfare book, but Gray deserved more attention as the first, strongest, and most effective American promoter of Darwin's theory of natural selection. Gray, a renowned botanist at Harvard, did this work on behalf of Darwinism while maintaining in frank correspondence with Darwin that Gray saw no difficulty in understanding the theory of natural selection as fully compatible with traditional Christian doctrines of divine Providence. Gray went to his grave affirming classical Christian beliefs concerning the deity of Christ as well as the traditional Christian account of human sinfulness and divine salvation in Christ.<sup>10</sup>

Perhaps even more notable as someone who promoted major aspects of Darwin's science in the United States was a theologian from Princeton Seminary, Benjamin B. Warfield, who was alive and active when White published his big book. Warfield's support for evolution is especially noteworthy since Warfield was, in his day, the nation's strongest supporter for the theological concept of biblical inerrancy, the belief that the Bible makes no mistakes whatever. Warfield wrote carefully about evolution and with several qualifications, but he also articulated his conviction on many occasions that natural selection did not in principle contradict historic Christian faith nor did it undermine a very high conception of the Christian Scriptures.<sup>11</sup>

(11) The Importance of Place. Notable historical studies have also demonstrated how important local religious contexts have been for attitudes toward scientific proposals like evolution.<sup>12</sup> When evaluating Darwinism, for example, it made a great difference whether debates took place in Belfast, with a history that had pitted modern science against traditional theology, or in Edinburgh, where the local culture had encouraged traditional theology and modern science together. Skirmishes, shots across the bow, much sound and fury—all certainly did attend the introduction of Darwinism in European religious life. But it was hardly a general state of warfare.

(12) Testimony of the popes. The last two popes have made nuanced statements about what balanced Christian teaching should say about scientific investigations of human kind. In 1996, John Paul II gave an address to the Pontifical Academy of Science on “The Question of Evolution” in which he affirmed traditional Catholic teaching that humankind was created in the image of God. Yet the address also explained why the church could and did accept modern evolutionary theory so long as that theory did not lead to “materialist” or “reductionist” metaphysical conclusions about the nature of humanity. Joseph Ratzinger, before he became Pope Benedict XVI, said much the same thing in a series of lectures defining “a Catholic understanding of the story of creation and the fall.”<sup>13</sup>

(13) Recent scientists as traditional Christians. The recent past also reveals many instances where anything but warfare has characterized science and theology. Particle physicist John Polkinghorne and physician-geneticist Francis Collins are only two of many contemporary scientists respected for their leadership in research who have written eloquently about how their practice of science fits easily within a framework of traditional Christian belief.

(14) Recent scientists as peacemakers. Even better known are modern scientists who have labored to defuse tensions between religion as such and science as such. The late Stephen Jay Gould is the most prominent of these figures; Gould’s principle of NOMA—“Non-Overlapping Magisteria”—certainly has not resolved all possible tensions involving science and theology, but it represented a major effort to differentiate proper goals of scientific and religious inquiry, and by differentiating them to ease artificial tensions.

An action taken by the National Association of Biology Teachers in 1997 showed the same desire to minimize needless occasions of conflict. In 1995, this association had issued an official statement about what its leaders took to be a modern scientific consensus: “The diversity of life on earth is the outcome of evolution: an unsupervised, impersonal, unpredictable and natural process.” When, however, the objection was raised that words like “unsupervised” and “impersonal” represented metaphysical conclusions rather than the results of empirical inquiry, the association agreed and dropped the words “unsupervised” and “impersonal” from its definition of evolution.<sup>14</sup>

(15) Christian support for modern natural science. From the seventeenth century to the present, many traditional Christians who are also scientists have given their wholehearted support to the study of nature limited to what can be observed empirically. In other words, with eyes wide open, they have advocated “naturalism” as defined by historian Ronald Numbers: a “purely methodological commitment to explaining the workings of nature without recourse to the supernatural, largely devoid of metaphysical implications about God” At the same time, such scientist Christians reject “naturalism” defined as “a philosophical embracement of materialism tantamount to atheism.” To follow Numbers again, the former definition of naturalism has always enjoyed “much support from devout Christians, who often eagerly embraced it as the method of choice for understanding nature.”<sup>15</sup>

(16) Conservative Christianity and literal interpretation of Genesis. From the time of Augustine to the present, a large number of theologically traditional Christians have interpreted the early chapters of the Book of Genesis in ways that welcome scientific investigation. To be sure, traditional Christian believers who stress literal interpretation of the days of creation and of Noah’s flood have received much attention, whether Phillip Gosse in the nineteenth century, who felt that God had created the world with only the appearance of great age, or flood geologists in the present, who ascribe the appearance of great geological age to the workings of Noah’s flood. But even more common among traditional Christian believers who have become expert in ancient texts and mid-eastern cosmology is a long line of scholars who do not read early Genesis as a guide to modern science. This group included the nineteenth-century conservative, William Henry Green, of Princeton Theological Seminary, who showed how to read the genealogies of Genesis as allowing for vast eons of time, and many modern biblical commentators—including Derek Kidner, Bruce Waltke, John Sailhammer, Ronald Youngblood, and John Walton—who interpret early Genesis as directed against the gods of Egypt and Babylon rather than toward the questions of contemporary science.

\* \* \* \* \*

In sum, a plethora of well-established historical conclusions, along with observations from the present day, demonstrate beyond cavil that no simple formula can adequately describe the rich, thickly textured, and complex history linking Christianity and science. Throughout most of the last 1700 years, Christian believers have simply shared the intellectual conventions of their day; sometimes they acted to retard the empirical investigation of nature; sometimes they promoted it. In the sixteenth through eighteenth centuries, when modern science emerged as a distinct field of human inquiry, Christian beliefs played a prominent role in almost every move resisting science, and they played a prominent role in almost every move promoting science. Since the eighteenth century, religious controversies over science have been driven by dogmatic theology, by secular belief, by factors having nothing directly to do with science or religion, and by much else. Since that time religious cooperation with science has been driven by dogmatic theology, by secular belief, by factors having nothing directly to do with science or religion, and by much else. The historical picture is complex, and Western history has certainly witnessed much argument that involves science and religion. But warfare is simply not the best metaphor to capture that history. Rather, negotiation, dialogue, competition, workaday hiccups, and isolated thunderstorms are all better metaphors to describe what has actually occurred.

Having shown what I think are fatal problems attending A. D. White's notion of warfare, I would like now to describe White's wisdom in placing the dramas he mis-described in Christendom. The perceptive contribution offered by that one word offers a key that unlocks a conundrum—why, if there are no well-grounded reasons for using the Warfare metaphor, does Warfare nonetheless remain very much alive in popular perceptions of issues involving science and religion? The answer, I think, is provided by understanding Christendom, and particularly the shape that Christendom has taken in the history of the United States.

The significance of White's reference to Christendom hinges upon understanding what Christendom meant and how it functioned in the intellectual history of the West. Christendom arose in the fourth century. (The legacy of Christendom is illustrated by the fact that if I say "fourth century, A.D.," I may offend some readers; but if I say, "fourth century of the common era," I might offend still others.) In the fourth century, A.D. or C.E., the Roman emperors Constantine and Theodosius themselves became Christian adherents; they used the power of the imperial state to promote Christianity; and they looked to Christianity to advance the interests of the Empire. From that time, Christendom meant a vision of society in which the institutions of an inherited and respected visible Christian church provided the main ordering principles for education, culture, and much else; where government deferred to the church for matters concerning family, personal morality, culture, and education; and where, in turn, the institutions and personnel of Christianity provided legitimization for governments that carried out what were considered the God-ordained tasks of preserving social stability and perpetuating the favored social position of the visible church.

Evaluated for its ability to encourage Christian virtues and to promote Christian learning, Christendom enjoyed modest success throughout the Middle Ages, perhaps especially in the thirteenth century when the practical ethics of St. Francis and the profound scholarship of Thomas Aquinas demonstrated how fruitful a Catholic canopy for all of life could be. Evaluated for its ability to secure a just and stable social order, Christendom might be judged as intermittently successful.

The vision behind Christendom enjoyed remarkable staying power, especially in its commitment to two foundational principles: first, all of life—social, political, intellectual, cultural, religious—was joined together under God; second, because of that unity, the institutions of church and state had a mutual obligation to cooperate closely in order to realize the potential of life under God. In the middle ages, these institutions were roughly balanced in their effective authority—sometimes emperors and kings took the lead, sometimes popes, bishops, and abbots provided direction. In the Byzantine East, and then in Russia, the Eastern Roman Emperor and the Czars dominated the system so much that Christendom came to be known as Caesaropapism. In the West, the assumption of Christendom survived the Reformation of the sixteenth century almost entirely intact. Except for a tiny fringe of Anabaptists and other radicals, Protestants were content with the social order inherited from the Middle Ages. The

main difference was that in Protestant areas mini-Christendoms (Lutheran, Calvinist, or Anglican) replaced the maxi-Christendom of the Catholic middle ages.

Only in the seventeenth and eighteenth centuries did direct challenges arise to the Christendom ideal. But these challenges were not marked by questioning the total overlap of religious and political spheres. Rather, they were marked by struggles of increasing intensity to control the means of intellectual production. Some early champions of the Enlightenment looked to “a republic of reason” to supplant the inherited intellectual regime. The French Revolution may be considered a palace revolt in which a dictatorship of throne and altar was replaced by a dictatorship of tribune and guillotine. In the nineteenth century, anticlericalism became the badge for those who worked to replace the inherited church regimes of Christendom with newer regimes of secular liberal reason. Early in the twentieth century, the Bolshevik Revolution in Russia successfully replaced Byzantine Caesaropapism with a militant anti-Christendom. Under Communist rule, the same degree of sovereignty over all spheres of life was claimed by the commissars and Josef Stalin as had been claimed by the Russian Empires and the Orthodox Church. Only in the nineteenth century did some Europeans begin to think that the various spheres of life could be disaggregated in such a way that innovations in one sphere need not be perceived as threatening stability in all spheres.

For science under Christendom and the secular successors of Christendom, intellectual disputes invariably became political disputes. Disagreements over how the physical world functioned regularly became struggles for power over the authority to determine scientific orthodoxy. Examined superficially, we see Science at war with Theology. Examined with any care, we find individuals and interest groups, usually with mingled scientific and theological allegiances, struggling to control the broadly defined universalism of Christendom.

It has been one of the great triumphs of the modern history of science to demonstrate this remarkably consistent pattern in intellectual disputes from the middle ages to the present. Thus, historians of the middle ages have shown how crucial it was for Thomas Aquinas to secure the support of King Louis IX of France for his Christianized Aristotelianism in combating the double-truths of Averroes. Historians of the Reformation era have demonstrated the connections between Copernicus’ theories and power politics among Catholics, Lutherans, and Calvinists, and within each of these confessions. The Galileo story has long since passed from a simple tale of enlightened science versus ecclesiastical despotism to a complicated story of papal politics, partisan advantage, and personal self-assertion. Steven Shapin’s outstanding works on the era of Robert Boyle show how trust in science grew from a particular set of circumstances encouraging trust in scientists. For the early decades of modern science in Britain, Margaret Jacob and J. C. D. Clark have shown how tightly interwoven were Newton’s scientific proposals and attitudes toward England’s state-church regime. A host of historians—led by Frank Turner, Bob Young, James Moore, and Adrian Desmond—have demonstrated that in nineteenth-century Britain all battles over the truth or falsity of Darwinism were also battles between a settled cohort of gentlemen clerical naturalists and a rising cohort of newly professional “scientists.” In the Soviet era, when Trofim Lysenko’s objections to Mendelian genetics won Stalin’s favor, published opinions on a wide range of biological phenomena could win scientists instant preferment or instant imprisonment.

In all of these situations, we see at work the dynamics of Christendom, or its anti-Christendom alternatives. It was the great merit of Andrew Dickson White that he recognized the persistence of intellectual warfare in Christendom; it was the fault of his analysis to describe that warfare as between Science and Theology. What actually went on has been understood more accurately by John Hedley Brooke, perhaps the most accomplished general authority on the subject today; in his view, the historical record consistently shows:

*the complexity of the relationship between science and religion...Popular generalizations about that relationship, whether couched in terms of war or peace, simply do not stand up to serious investigation. There is no such thing as the relationship between science and religion. It is what different individuals and communities have made of it in a plethora of different contexts.<sup>16</sup>*



In American history, Christendom has taken a greatly modified form. Throughout the colonial period of our history, the peculiar circumstances of European settlement pushed towards the separation of church and state. That separation became constitutional policy for the national government with the First Amendment of 1791. In the individual states, the separation of church and state was completed only a few decades later. The United States of America, therefore, did not replicate European Christendom. Presidents and Congress have not passed legislation telling churches what to do. Churches and religious advocates have tried to influence public policy, but they have not been able to dictate policy. Not until the Morrill Act of 1862 did the federal government offer any serious sponsorship for higher education of any kind. Not until World War II did government funding for research become a central part of the more general history of science.

But if the entanglements of European Christendom have not existed in the United States, it does not mean that the Christendom pattern vanished entirely. Rather, in the U.S., Christendom was democratized. Informal and populist persuasion through the public media replaced the formal and institutional links that had joined church and state in Europe. The result was the society that Alexis de Tocqueville described in the 1830s. In his view, the U.S. was the most successful democracy in the world, and it was a democracy that provided for unexpected social, moral, and economic flourishing. But it was also a system susceptible in de Tocqueville's opinion to what he called "the tyranny of the majority." Democracy did not mean the absence of coercive force exerted upon ideas; it meant, rather, the transformation of top-down authority into bottom-up conformity.

For the development of an American style of informal Christendom, science (or natural philosophy, as it was called in the early years) played a very important part. The United States gave up formal ties between church and state. It repudiated the corrupt authority of inherited monarchies and inherited titles of nobility. Its republican principles placed the onus for creating stable government on the people at large. Americans sat lightly to the dictates of history and the precedents of tradition. It was "the first new nation" and "a new order for the ages."

The only traditional European authorities that Americans did not jettison in the Revolutionary era were the Bible and the deliverances of empirical natural philosophy. With both of these authorities, Americans could read and reason for themselves. With both, those who convinced others of their own expertise in reading Scripture and in reading nature exerted much greater power than those who clung to tradition, aristocratic privilege, or inherited authority. In the early decades of the nineteenth century, well-known Christian leaders were successful in demonstrating to the people at large that the best empirical science supported a traditional understanding of Scripture. Earnest laymen and the leaders of the nation's colleges, most of whom were clergymen, persuasively put to use the methods of Baconian science and the natural theology of William Paley to demonstrate the truths of Christianity and the harmony of Scripture and science.

As an example, Timothy Dwight, a much admired president of Yale College, won renown for his ability to persuade students that science and the Bible harmonized perfectly. When he became the Yale president in 1795, rambunctious students inspired by the French Revolution were actively challenging the college's Christian traditions. Their challenge was expressed in strongly republican terms: Christianity was suspect in their view precisely because it "was supported by authority, and not by argument." In response, Dwight boldly called all comers to debate the question, Are the Scriptures of the Old and New Testaments the Word of God? After appealing for those who doubted the Scriptures to "collect and bring forward all the facts and arguments which they could produce," Dwight "triumphantly refuted their arguments[,] proved to them that their statement of acts was mistaken or irrelevant" and by "the exposure of argument" recovered the ground for Christianity.<sup>17</sup> Dwight showed, in other words, how the traditional ends of Christendom could be gained with the new tools of democratic persuasion. He had preserved the interests of the church and the interests of social order in tandem with each other, not by an edict from on high, but by the power of demonstration.

Later in American history the outcome, when leaders appealed—as Dwight had done—simply to the facts, was different. By the time that A. D. White first addressed questions of religion and science, spokesmen for the intellectual equivalent of the French Revolution were doing a better job at persuading the American public that they should be heeded than were the defenders of traditional Christianity. The era's new educational leaders, like A. D. White, were using their persuasive powers to convince others that non-sectarian science deserved the support that

had once been bestowed on sectarian science. Nonetheless, the venue of popular opinion that Dwight had exploited for his victory remained the venue that the new breed of educators exploited to win their battles. Persuasion by means of popular opinion, in other words, became the American substitute for coercion by means of monarchical dictate.

But of course, even in a democracy, “the will of the people” has to take institutional shape. Once persuaded, legislatures, courts, taxing bodies, and other instruments of public order have often acted as self-confidently as the aristocrats of Christendom acted in carrying out their wishes.

The early history of Cornell University itself shows how these peculiarly American dynamics worked. Early plans for one university that could combine a traditional focus on the liberal arts with a newer emphasis on the mechanical arts funded by the Morrill Act did not seem controversial.<sup>18</sup> But as these plans were taken up by two leaders in the New York senate, the aging Ezra Cornell and the young A. D. White, things became more complicated. For different reasons, Cornell and White had become strong advocates of what they called non-sectarian learning. Cornell had been offended when the Society of Friends ousted him for marrying a non-Quaker. White had become disillusioned with his era’s standard church-sponsored higher learning when he spent a year at a denominational college where, in his account, everything was pandemonium. As a young man, furthermore, White had become personally convinced that theologically specific education stood in the way of the progressive, evolutionary religion he favored. At first it seemed a natural thing for Cornell and White to propose that their university would be nonsectarian. But when the legislation establishing the university was passed in 1865, opposition from leaders of denominational colleges sprang out of the woodwork. In hard-hitting attacks, opponents claimed that nonsectarianism was simply a stalking-horse for infidelity. They used the same word, infidelity, to describe White’s plan for hiring faculty of all denominations. They blasted White’s proposal for a nonsectarian chapel program. Some of this criticism was motivated by principle. Some was motivated by a desire to share in the money provided by the Morrill Act. Much of it was over the top.

Decades later, White reported that at first he resolved simply to ignore this criticism. But then he decided on another course, which he put like this: “I stood for a time on the defensive,” but “finding that this only provoked new attacks I determined to take the offensive which I did in my lecture on the ‘Warfare of Science’.”<sup>19</sup> Instruction at Cornell University began in 1868. White delivered his lecture at the Cooper’s Union in New York City the very next year. So, in this manner, the battle for public opinion in New York State became “Christendom” and strident debate over the educational needs of New York in the mid 1860s became an entire “History of the Warfare of Science with Theology.”

In the contemporary United States, with our democratic form of Christendom, disputes involving science and religion play out in democratic venues that much resemble the venues in which A. D. White struggled to get Cornell University off the ground. Popularly elected legislatures pass laws to define the boundaries between science and religion; the same bodies collect taxes and disburse public funds in ways that control investigation of science and religion. Courts work to find the right balance between, on the one side, particular religious and scientific interests and, on the other, the general public good.

The United States does not have a monarchy, but we do have talk radio. We do not have close collaboration between church and state, but we do have dueling media—for example, the play “Inherit the Wind” versus Ben Stein’s film “Expelled: No Intelligence Allowed.” We do not have a divine right of kings, but we do have expert marketers who know how to promote books with titles like The God Delusion and Defeating Darwinism. We have many religiously-inspired statements about science from people with little or no scientific expertise. We have many statements by people claiming to speak for science who have little or no philosophical expertise. Here is the critical point: if misinformed people making such statements are more persuasive for a particular audience than those who speak about such matters with expertise, then for that particular audience in this democratic polity, the uninformed exercise a coercive authority over the informed.

Andrew Dickson White knew what he was talking about when he wrote about Warfare. But he misunderstood the nature of that conflict. His own life experiences had well prepared him to write a big book on

what he had experienced, not—to be sure A History of the Warfare of Science with Theology in Christendom, but something on the order of The Struggle for Hegemony over Public Discourse among Interested Parties in a Democratic Polity. To be sure, the title of the book he did not write does not have quite the punch of the title of the book he did write. But it would have described much more accurately what he had personally experienced and also what his life's incessant historical research had uncovered.

\* \* \* \* \*

This is the end of my historical account. But the nature of this topic might leave at least some readers interested in what my own positive peace plan would look like. The two suggestions I offer grow out of my understanding of the particular American circumstances that created the informal American variant of Christendom.

First is a counsel of peace for those who are convinced that the Bible demands a young earth, or that belief in the Bible dictates a particular approach to design in nature, or that trust in Scripture must oppose reliance on the methods of modern science. To such ones my advice is to accept the possibility that traditional interpretations of Scripture can be changed without weakening the main message of Scripture. The simplest way to implement this advice is to urge those who believe the Bible is the Word of God to listen carefully to others who believe the very same thing and who have been called as trained students of nature.

A more complicated way to frame such advice is to follow this chain of reasoning: First, traditional Christians believe what the Bible says about the origin of all things in God's creative acts. But traditional believers also hold that natural processes are sustained by God and that human minds can discover how nature works only because God made the human mind capable of understanding nature. What God-enabled minds find out about God-sustained nature must, therefore, come into play when believers interpret the God-inspired Scriptures. God is the author of the book of nature as well as the book of Scripture; there is no future in trying to read these books against each other.

My counsel of peace for those who fear the threat of religious believers focuses on a clear understanding of the development and actual working of modern science. From my angle, it is an intellectual scandal to see how often capital-s Science is enlisted to defend or attack concepts like the existence of God. Yet modern science is defined by its very nature as the empirical study of naturally occurring cause and effect relationships; as such, it must be entirely neutral on questions of teleology or purpose, on questions of intelligent design, or questions of divine providence—since these are all questions that, in principle, cannot be answered by close examination of the natural world. Inference, deduction, application, or some other intellectual move is always required when going beyond systematized observations in the realm of nature to larger claims about the existence or non-existence of God, about purpose, about design, and even about miracles. Of course science as such makes a contribution to all such moves that argue for or against traditional understandings of God. But it is a logical fallacy of the first order to suggest that Science by itself solves any of the major questions about the nature of human destiny.

In the midst of one of the recent debates over design in evolutionary biology, a physicist from Washington University, St. Louis, made the necessary, but all too uncommon, self-denying assertion:

*It all comes down to what is said about the mutations that provided the genetic variation underlying the observed evolution of life on earth. Simplifying to one sentence: We have no evidence, one way or the other, about the randomness or purposelessness of those mutations, and it is reasonable to ask teachers not to claim that we do.<sup>20</sup>*

Evidence about mutations abound; evidence for purpose, strictly considered, must come from domains other than science defined as systematic empirical study of natural phenomena.

\* \* \* \* \*

Given the long history of conflicts swirling around issues of science and religion, I have no illusions that the suggestions of this one brief paper can bring about a just and lasting peace on these issues. But I do hope that after this kind of primarily historical account, it may be possible to entertain the notion that because there has never been such a thing as the Warfare between Science and Theology, debates involving science and religion can be carried out with more light and less heat than has often been the American experience.

## Notes

1. Two different printings of White's two-volume study have been used for this paper. Parenthetical roman numerals in the text are from White's introduction as found in [A History of the Warfare of Science with Theology in Christendom](#), reprint edition (Gloucester, MA: Peter Smith, 1978). Parenthetical Arabic numerals are from the same work (Amherst, NY: Prometheus Books, 1993).
2. In what follows I am deeply indebted to the historical work of David N. Livingstone, James R. Moore, Ronald Numbers, David Lindberg, John Hedley Brooke, Peter Harrison, and a host of their collaborators in the modern history of science who have opened up the subject in such splendid fashion. Errors of fact or interpretation are strictly mine alone.
3. For orientation, see [A Summa of the Summa](#), ed. Peter Kreeft (San Francisco: Ignatius, 1990), 174 (from Thomas Aquinas, [Summa Theologica](#), I, 22, 4); and B. B. Warfield, "Calvin's Doctrine of the Creation," [The Works of Benjamin B. Warfield, Vol. 5: Calvin and Calvinism](#) (New York: Oxford University Press, 1931), 287-349.
4. David C. Lindberg, "Galileo, the Church, and the Cosmos," in [When Science and Christianity Meet](#), ed. Lindberg and Ronald L. Numbers (Chicago: University of Chicago Press, 2003), 59-60.
5. Richard S. Westfall, "The Rise of Science and the Decline of Orthodox Christianity: A Study of Kepler, Descartes, and Newton," in [God and Nature: Historical Essays on the Encounter between Christianity and Science](#), eds. David C. Lindberg and Ronald L. Numbers (Berkeley: University of California Press, 1986), 219.
6. Nancy K. Frankenberry, ed., [The Faith of Scientists in their Own Words](#) (Princeton: Princeton University Press), ix.
7. See James R. Moore, "Of Love and Death: Why Darwin 'gave up Christianity,'" in [History, Humanity and Evolution: Essays for John C. Greene](#), ed. James R. Moore (New York: Cambridge University Press, 1989), 195-229.
8. Adrian Desmond and James Moore, [Darwin's Sacred Cause: How a Hatred of Slavery Shaped Darwin's Views on Human Evolution](#) (Boston: Houghton Mifflin, 2009).
9. For a recent update, see David N. Livingstone, "That Huxley Defeated Wilberforce in Their Debate over Evolution and Religion," in [Galileo Goes to Jail, and Other Myths about Science and Religion](#), ed. Ronald L. Numbers (Cambridge, MA: Harvard University Press, 2009), 152-60.
10. For details, see A. Hunter Dupress, [Asa Gray](#) (Cambridge, MA: Harvard University Press, 1959).
11. For historical context and relevant documents, see B. B. Warfield: [Evolution, Science, and Scripture—Selected Writings](#), ed. Mark A. Noll and David N. Livingstone (Grand Rapids: Baker, 2000).
12. For example, David N. Livingstone, [Putting Science in its Place: Geographies of Scientific Knowledge](#) (Chicago: University of Chicago Press, 2003).
13. Pope John Paul II, "Message to Pontifical Academy of Science: October 22, 1996," [Catholic Information Network](#), [www.cin.org/jp2evol.html](http://www.cin.org/jp2evol.html) (2/25/09); Pope Benedict XVI (Joseph Ratzinger), "[In the Beginning](#)": [A Catholic Understanding of the Story of Creation and the Fall](#) (Grand Rapids: Eerdmans, 1995 [original 1986]).
14. Quotation from Larry A. Witham, [When Darwin Meets the Bible: Creationists and Evolutionists in America](#) (New York: Oxford University Press, 20??), 71.
15. Ronald L. Numbers, "Science without God: Natural Laws and Christian Beliefs," in [When Science and Christianity Meet](#), 266.
16. John Hedley Brooke, [Science and Religion: Some Historical Perspectives](#) (New York: Cambridge University Press, 1991).
17. See Mark A. Noll, [America's God: From Jonathan Edwards to Abraham Lincoln](#) (New York: Oxford University Press, 2002), 234-35.
18. A. D. White, [Autobiography of Andrew Dickson White](#), 2 vols. (New York: Century, 1905); Walter P. Rogers, [Andrew D. White and the Modern University](#) (Ithaca: Cornell University Press, 1942); Glenn C. Altschuler, [Andrew D. White: Educator, Historian, Diplomat](#) (Ithaca: Cornell University Press, 1979); James R. Moore, [The Post-Darwinian Controversies: A study of the Protestant struggle to come to terms with Darwin in Great Britain and America, 1870-1900](#) (New York: Cambridge University Press, 1979), 29-49.
19. Quoted in Rogers, [Andrew D. White](#), 83.
20. Mark Alford, letter to the editor, [First Things](#), Aug.-Sept. 2005, p. 8.