

Should Creationism Be Taught in the Public Schools?¹

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Abstract: This article discusses philosophical arguments relevant to the question of teaching creationism, especially with regard to developments in the debate since the early 1990's. §1 reviews the new factions within the creationist movement, and the overlapping views from "young earth" to "intelligent design" creationism, as well as non-Christian varieties. It also considers what are the relevant differences for the policy question for private, public schools, and for home schoolers, as well as possible differences in what it means to "teach" creationism. §2 & 3 discuss the main legal arguments that have ruled in the public school case, as well as arguments from academic freedom, fairness, censorship, parental rights and majority rule. §4 evaluates the

¹ I would like to thank the Association for Philosophy of Education for inviting me to address this question at their meeting in December 1998, at the American Philosophical Association Eastern Division Meeting. This paper is a slightly revised version of that address. Besides including some additional references, it incorporates my response to Alvin Plantinga, who gave the commentary address on my original paper.

epistemological issues regarding competing claims of truth, and the contention that excluding “what Christians know” (Alvin Plantinga) amounts to “viewpoint discrimination” (Phillip Johnson). §5 argues that religious protection arguments actually favor excluding creationism more than including it. §6 considers the goals of education, especially Dewey’s views on science education, and what these imply regarding the teaching of a “theistic science”. In §7, I review a new argument of Alvin Plantinga based upon a purported Rawlsian basic right of a parent not to have her children taught anything that violates her comprehensive beliefs, and show why Rawlsian agents would reject it.

I. THE QUESTION

Should creationism be taught in the public schools? The full range of issues for educational philosophy and policy that are the subject of debate in the creation / evolution controversy are too numerous to be covered in any one article, so in this first section I begin by analyzing the question so that we might better focus our discussion. I will use this opportunity to point out related questions that have so far not been considered in the debate, but that deserve the attention of philosophers of education. In subsequent sections I will discuss, in turn, a variety of legal arguments, creationists’ extra-legal arguments, epistemological arguments, religious protection arguments and arguments from educational philosophy and justice that are relevant to our specific question. Because creationism is primarily an American phenomenon, some of the considerations will be specific to the circumstances in the United States, but many of the arguments are generally applicable.

(a) *The Public Schools.* The controversies about educational policies concerning creationism have almost exclusively involved the teaching of evolution in the public schools, so this is a natural locus from which to consider the problem. However, several key elements of the controversy would be quite different if we looked at the issue in other educational settings, such as private and parochial schools, home schooling, and in higher education.

There has been very little consideration of the issues for private rather than public schools, no doubt because the governance of the former is not subject to public control and review in the same way. However, there is still a measure of external oversight in that private schools must meet certain standards in order to get and maintain accreditation. It is a reasonable question to ask whether a school deserves to be accredited if it teaches creationism rather than evolution in its science classes. Given that accreditation implies that a school meets professional standards in the appropriate subject matter, a school that teaches creationism in science classes does not meet the standard, since evolution is at the core of basic scientific knowledge. Moreover, as we shall see, creationism rejects not only evolution, but other well-established scientific facts from across the sciences. In general, however, we tend to take for granted that private schools, if they do not receive public funds or certification, are not subject to public standards and may teach whatever private, esoteric doctrines they choose.

For parochial schools, we fully expect that religious views will be taught. This is the most natural setting for creationist views, and it is primarily here that we find creationism taught in science classes. This is not to say, of course, that all or even most parochial schools teach creationism. For instance, based on an informal assessment of my undergraduate students, those who studied at Catholic high schools typically have had the best education on evolution, often better than their public school counterparts. Fundamentalist and evangelical “Bible schools”, on the other hand, often cite the

creationist orientation of their science curriculum as a major selling point to their clientele. As they see it, all true knowledge has a biblical basis. Gil Hansen, head of the Fairfax Baptist Temple school, explains his school's educational philosophy, which seems to be representative on this point: "What we do here is base everything on the Bible. This becomes really the foundation, the word of God is the foundation from which all academics really spring". (Duvall 1995) How does the school teach evolutionary theory? Hansen is clear about the school's position on this as well: "We expose it as a false model".

Unless the government begins to significantly fund parochial schools with tax dollars, such as through a voucher program or through religious charter schools, parochial schools can probably expect to remain free to teach creationism or whatever religious doctrines they choose. Moreover, fundamentalist and evangelical schools often choose to forego secular educational accreditation, and may be accredited only within their own independent system. Nevertheless, I would still argue that there are serious issues of educational philosophy to consider even in this setting. Is it right to teach children that something that is known to be true is false? Is it not bad faith to misrepresent the findings of science in what is purported to be a science class? If the basis for knowledge is taken to be biblical revelation, is it not intellectually dishonest to put such revelations forward as science? Important moral questions are at issue here; religious schools that teach creationism as science are violating basic norms of honesty.

Most of these same considerations apply if we move to consideration of home schooling. There have always been parents who, for one reason or other, chose to teach their own children at home rather than send them to school, but currently the vast majority of home schoolers consists of religious conservatives who do not want their children to be exposed to what they take to be the evils of the public schools, be it sex education or evolution. Home schooling raises some unique policy issues, since basic education is compulsory and parents must demonstrate that they are providing their

children with an education that meets state standards. Oversight of parents who teach their own children is inconsistent, and it seems to be fairly common that fundamentalist home schoolers teach the bare minimum of what they have to of subjects they object to, and then regularly supplement the required curriculum with the religious education—in Bible study, creationism, and so on—that they desire. Are parents doing an educational disservice to their children in teaching them creationism on the sly? One might ask whether stricter oversight is necessary in such cases.

Examining the issue in the setting of higher education overlaps some of the previous considerations, but with some relevant differences. One of the most important is the age and maturity of the students. Most undergraduates are at a more advanced developmental stage than they were in high school, so some new educational goals begin to apply. Certainly one of the most significant is that we expect undergraduates to begin to hone their critical and evaluative thinking skills, and to develop disciplined independence of mind. At this stage, it can be quite appropriate and instructive to discuss creationist views, so that students can learn to see what is wrong with them. Of course, there are any number of other topics that could also serve the same end, but a professor might legitimately choose to dissect creationism in the same way that one might choose to have students dissect a snake rather than a frog in anatomy class. One question we will have to address is whether this might not be a reasonable educational goal in secondary school public education as well.

For the most part, we will leave consideration of these other venues aside, and focus on the public schools, which historically have been (and for the most part remain) the central locus of the controversy. The general causes of the creationism controversy—perceived conflicts between evolution and some Christian views about Creation—have remained fairly constant over the decades, but these have manifested themselves differently in different periods. In the early decades of the public school system in the United States, few textbooks incorporated evolution, and once they did

begin to do so many states responded by passing legislation that banned the teaching of evolution altogether. In 1925, the antievolutionary Butler Act in Tennessee led to the first legal battle over creation and evolution in the schools—the famous *Scopes* trial. Such antievolutionary laws remained in effect until they were finally overturned by the U.S. Supreme Court in 1968. Creationists countered at first by passing state laws in the early 1970s to give “equal emphasis” to the Biblical account. Since these and similar state laws were struck down in the 1980s, creationist activists have turned to other tactics and venues, getting laws passed that require, for example, “disclaimers” to be read before biology classes in which evolution would be covered. Alabama public school students, for example², find a disclaimer pasted in their biology textbooks that begins:

This textbook discusses evolution, a controversial theory some scientists present as a scientific explanation for the origin of living things, such as plants, animals and humans. No human was present when life first appeared on earth. Therefore, any statement about life’s origins should be considered as theory, not fact.

In other states, creationist “stealth candidates” on local school boards and State Boards of Education speak publicly at first only of a “back to basics” education policy, but then work to change science curriculum standards to include creationism or to gut any evolution component, even though evolution is basic to biological science. A few go further and require that “evidence against evolution” or “alternative analyses of

² As I revise this paper now in December 1999, evolution disclaimers are making national news again, as the Oklahoma State Textbook Committee, whose appointed membership is heavy with religious conservatives, has just mandated that publishers wishing to do business with the state include the same disclaimer that is used in Alabama in any textbook that includes evolution.

evidence” be presented. Some teachers simply ignore the law and go ahead and teach their creationist views, for instance about “intelligent design”, in their individual classrooms. These and other examples of creationist activism in the public schools keep this venue at the center of the controversy.

(b) Kinds of Creationism. The next element of the question before us that we need to examine is the notion of creationism itself. If creationism were to be taught, what would that include? In general, creationism is the rejection of evolution in favor of special creation of some form, but we must recognize that there are a wide variety of different, competing views that fall under this concept.

The most common form of “creation-science” is what is known as “young-earth creationism” (YEC). In the law they got passed in 1982 in Arkansas, creationists proposed the following outline of what they wanted to have taught.

- (1) Sudden creation of the universe, energy, and life from nothing;
- (2) The insufficiency of mutation and natural selection in bringing about the development of all living kinds from a single organism;
- (3) Changes only within fixed limits of originally created kinds of plants and animals;
- (4) Separate ancestry of humans and apes;
- (5) Explanation of the earth’s geology by catastrophism, including the occurrence of a worldwide flood;
- and (6) A relatively recent inception of the earth and living kinds. (La Follette 1983, p. 16)

A more complete outline of the young-earth “Creation model” may be found in (Aubrey 1998 (1980)). It is also important to understand that creationism does not end with its rejection of biological evolution, though this is the main thesis that so far has been at issue in the public controversy. As we see in the list above, and as I have shown in detail elsewhere (Pennock 1999, Ch. 1), creationism also rejects scientific conclusions of

anthropology, archeology, astronomy, chemistry, geology, linguistics, physics, psychology, optics, and so on. For instance, when creationists on the Kansas State Board of Education removed references to evolution from the state's science curriculum standards in 1999, they also took out plate tectonics, the geological chronology, Big Bang cosmology, and any mention of the ancient age of the earth.

We must also be aware that there is now considerable factionalism among creationists. Disagreements about the details of Christian theology, partial acceptance of scientific views, and different political strategies have given rise to splinter groups that question one or another of the standard views. Old-earth creationists, for example, do not insist that the world is only six to ten thousand years old and accept something closer to the scientific chronology. A few creationists doubt that there was a single, catastrophic worldwide flood, and hold that the Noachian Deluge may have been local to the Mediterranean, or, if global, then "tranquil" rather than catastrophic. Adherents of the YEC view far outnumber members of other factions, but it is important that we recognize that creationism is not a monolithic view and is split by deep divisions.

Though the traditional creationists remain the most active in their political and educational work, there was a significant evolution of creationism in the 1990s, beginning with the publication of *Darwin on Trial*, by Berkeley law professor Phillip Johnson. Johnson neither endorses nor denies the young-earth view, and argues that we should understand creationism as belief in the process of creation in a more general sense. People are creationists, according to Johnson's definition, "if they believe that a supernatural Creator not only initiated this process but in some meaningful sense *controls* it in furtherance of a purpose". (Johnson 1991, p. 4) Rather than speaking of "creation-science," Johnson and others among these new creationists call their view "intelligent-design theory" and advocate a "theistic science". Intelligent-design creationists include both young-earth and old-earth creationists, but for the most part they keep their specific commitments hidden and speak only of the generic thesis of "mere creation". As do

other creationists, they oppose accommodation to evolution and take it to be fundamentally incompatible with Christian theism. In another way, however, they go further than creation-science does; they reject scientific methodology itself, arguing that scientific naturalism itself must be tossed out and replaced by their theistic science (though they are never clear about what its distinctive methods might be).

Although it has been fundamentalist and evangelical Christian creationists, especially the YECs, who have been the most active in opposing the teaching of evolution in the schools and pressing for inclusion of their view of Creation, we cannot fairly evaluate the question without also taking into account non-Christian creationist views. For the most part, adherents of these views have not been as politically active in the United States, so these have not reached the public attention to the same degree. It is impossible to even begin to canvas these numerous views, but I will mention by way of example, two recent cases that have made the news.

In Kennewick, Washington the 1996 discovery of a fossil human skeleton led to a very public legal battle between science and religion. The 9,000 plus year old bones were claimed by a coalition of Northwest Indians who wanted to immediately bury them. However, features of the skull seemed to be more Caucasian than Indian, and scientists questioned whether it was really a tribal ancestor and suggested that further analysis could help reveal something of early human history in the area. Armand Minthorn, of Oregon's Umatilla Tribe said his people were not interested in the scientists' views: "We already know our history. It is passed on to us through our elders and through our religious practices". Their history says that their God created them first in that place. Many Amerindian tribes have origin stories that, on their face, are antithetical to evolutionary theory and other scientific findings. (In parts of northern Canada, an alliance of Native Indians and Christian creationists has formed to oppose teaching evolution in the schools. It is an uneasy union, of course, because the groups differ sharply in what story of Creation they would put in its stead.) The controversy over the

Kennewick skeleton also involves another religious group, the Asatru Folk Assembly, an Old Norse pagan group. The members of this pre-Christian faith revere Viking-era Scandinavian gods and goddesses, and believe that their ancestors were the first inhabitants of the region. They expect that scientific study of the skull would support their claim of priority, though their other religious beliefs would certainly put them at odds with other aspects of the scientific picture.

Another religious anti-evolutionary view became newsworthy in 1995, when NBC broadcast a program entitled *Mysterious Origins of Man*, that purported to reveal scientific evidence that human beings had lived tens of millions of years ago. Creationists were at first elated by this primetime repudiation of evolution, but quickly withdrew their endorsement when they learned that the program was based on the 1993 book *Forbidden Archeology* (Cremo and Thompson 1993), which advances purportedly scientific evidence for a position that mirrors a Hindu view of creation and reincarnation.

Finally, let me mention one more type of view that is relevant to the controversy. The Raëlian Movement, which had its start in France in the 1970s, calls itself a “scientific religion”. Raëlians reject evolution and believe that life on earth is the result of purposeful, intelligent design, but they also reject creationism, in the sense that they believe that the creator was not supernatural. Instead, they believe that life on earth was genetically engineered from scratch by extraterrestrials. The founder of the Raëlian Movement, Claude Vorilhon, claims that he knows this because the truth was revealed to him by an extraterrestrial, who anointed him as the Guide of Guides for our age. Some 70,000 adherents worldwide, many in the U.S. and Canada, share this faith.

In considering whether creationism should be taught in the public schools, we must always keep in mind that all these (and many more) antievolutionary views would have to be included as “alternative theories” to the scientific conclusions.

(c) *Taught How?* The third element of the question that requires preliminary discussion involves the *kind* of academic course in which, and the *way* in which creationism might be taught.

The issues change dramatically, for instance, if the different forms of creationism were to be taught in a comparative religion class. The Constitution is not taken to bar discussion of religion in a course of this sort. One could imagine a course that surveyed the splendid variety of views of creation of different religions, and could make a good case that such a course might serve a useful educational purpose in fostering an appreciation of American and global cultural diversity. Many opponents of teaching creationism in the schools would be willing to compromise if the topic were to be introduced in such a course. The controversy arises mostly because creationists insist that their view be included as part of the science curriculum, and that it replace or be given equal weight to evolution.

Moreover, creationists want evolution to be revealed as a false model. Creationist textbooks that are used in fundamentalist schools often go further and teach that it is an evil view as well, promoted by atheist scientists who want to lure people away from God. Textbooks that they have promoted for use in public schools, however, keep the sermonizing about evolutionary evils to a minimum. The most common creationist proposals have followed what is known as the “dual model” approach, whereby “the two theories” are presented and contrasted. The Arkansas “Balanced Treatment” Act specified that the schools should give equal consideration to “creation-science” and “evolution-science”. Since all such legislation has been found unconstitutional, creationists now try to argue that science classes should simply present “alternative theories” besides the scientific view. In practice, however, the proposals are essentially unchanged. For example, the textbook *Of Pandas and People* (Davis and Kenyon 1993), which presents intelligent-design creationism and is by far the most carefully crafted

creationist offering to date, follows the same misleading framework of presenting the views of those who hold “the two” theories of biological origins, natural evolution and intelligent design, neglecting the variety of other views. The terms may have changed, but the dubious strategy it adopts is the same: evolutionary theory is claimed to be riddled with holes, with creationism left as the only alternative. Students are told that the textbook will allow them to do what no other does, namely, let them decide for themselves which theory is true. Of course, the deck is stacked so that evolution appears to lose on every point.

One cannot, however, judge simply from such creationist textbooks how creationism would likely be taught were it allowed in the classroom, since these are currently written more for political than for pedagogical purposes, to present an innocent face and get a foot in the door. (*Pandas*, for example, which is offered as a biology text, contains a long section that gives philosophical arguments for why intelligent-design should not be disqualified as a scientific hypothesis, and why it purportedly does not violate the court rulings that have found teaching creationism in the public schools to be unconstitutional. This is hardly standard fare for secondary school textbooks.) One can get a more realistic sense of what might happen in classrooms by looking at cases in which teachers have gone ahead and taught creationism despite the laws prohibiting it. To give just one representative instance, in a middle school in Harrah, Oklahoma, a suburb of Oklahoma City, a teacher took away students’ textbooks and distributed creationist material, teaching the students that a person who believes in evolution cannot believe in God. (RNCSE 1998 Vol. 18 No. 2 p. 5)

Finally, let me suggest one further way that creationism might be taught that has not been considered in the literature: Creationist views could be taught as illustrations of how *not* to do science. Specific creationist tenets could be presented and then the evidence reviewed, showing how scientists came to see that they were false. If not carried to extremes, this might turn out to be a useful educational exercise, in that

examination of some of the many errors of so-called “creation-science” or “intelligent design” could help teach students how real science is done. As John Dewey pointed out, science education is a failure if it consists of nothing more than the recitation and memorization scientific facts. (Dewey 1964 (1910); Dewey 1964 (1938), p. 19) To teach science well is to teach the methods of scientific reasoning, and a critical examination of creationism could serve very well for this purpose. If the courts were to permit the teaching of creation in the public school classrooms, this critical approach could become a common educational exercise in many science classrooms. Indeed, this is the only intellectually responsible way that it could be taught in a science class.

I will return to some of these issues shortly, but having delimited the focus of our discussion, let me now turn to the relevant arguments, beginning with a brief review of the legal reasoning that has excluded creationism from the public schools.

II. LEGAL ARGUMENTS

Because our focus is upon the public schools in the United States, the legal arguments involving the teaching of creationism have been and continue to be the most significant politically and practically. Both sides in the legal debate have argued that this is primarily a Constitutional question, with some proponents of teaching creationism claiming that it should actually be protected by the First Amendment, under the free exercise of religion clause. Opponents respond that creationists are not being prevented from exercising their beliefs in their churches, homes or private schools, but that teaching creation in the public schools would violate the First Amendment’s establishment clause. In a long series of cases, the courts have consistently ruled against the antievolutionists’ arguments.

Antievolution laws were struck down by the U.S. Supreme Court in the 1968 *Epperson v. Arkansas* case, on the grounds that the Constitution does not permit a state to tailor its requirements for teaching and learning to the principles or prohibitions of any

particular religious sect or doctrine. Subsequent rulings have helped define the boundaries of this ruling. In a 1981 case, a parent sued in California, claiming that classes in which evolution was taught prohibited his and his children's free exercise of religion. The Sacramento Superior Court ruled (*Segraves v. California*) that teaching evolution did not infringe on religious freedom, and that a 1972 anti-dogmatism policy of the School Board—which said that statements about origins should be presented non-dogmatically, and that class discussions on the topic should emphasize that scientific explanations focus on how things occur, not on ultimate causes—was an appropriate compromise between state science teaching and individual religious beliefs.

Creationists next tried to argue that their view should *not* be excluded on grounds of separation of Church and State, because it was not religion but science. The Arkansas legislature passed a bill requiring “balanced treatment” of what they called “creation-science” and “evolution-science”. The court struck down the law in the 1982 *McLean v. Arkansas* case, finding that creation-science was not a science but a religious view.³ The U.S. Supreme Court came to the same conclusion in the 1987 *Edwards v. Aguillard* case, striking down Louisiana's “Creationism Act” which required the teaching of creationism whenever evolution was taught. The court found that, by advancing the religious belief that a supernatural being created humankind, the act impermissibly legislated the teaching of religion, and that a comprehensive science education is undermined when it is forbidden to teach evolution except when creation science is also taught.

³ On this point, the court drew upon the testimony of both theologians and philosophers. For theological and philosophical perspectives on the question from two of the expert witnesses in the trial, see, respectively, (Gilkey 1985) and (Ruse 1988). (Kitcher 1982) is also a good source. For more recent philosophical discussions of the issue, see (Smith, Siegel, and McInerney 1995) and (Reisch 1998).

The court has also ruled, as in the 1994 *Pelozo v. Capistrano School District* case, that a teacher's First Amendment right to free exercise of religion is not violated by a school district's requirement that evolution be taught in biology classes, rejecting creationists' contention that "evolutionism" is a religion. In another recent case, in Louisiana, the 1997 *Freiler v. Tangipahoa Parish Board of Education* case, the court overturned a policy that would require teachers to read aloud a disclaimer whenever they taught about evolution, and also found that making curriculum proposals in terms of "intelligent-design" is no different from the legal standpoint than earlier proposals for teaching "creation-science".

When considering questions about what we ought or ought not do, however, we may never be content with answers that stop with the law, if only because we may have ethical duties that require more of us than the law does. Moreover, we must always consider the possibility that current law is itself unjust or unwise. In the sections that follow, I will examine several other sorts of arguments that address these points.

III. CREATIONIST EXTRA-LEGAL ARGUMENTS

In pressing for the reintroduction of their views into the schools, creationists most often argue that the legal rulings are themselves unjust in one or another way, appealing to a handful of arguments from fairness, majority rule, parental rights, academic freedom, and censorship. Here I'll briefly review and then respond to these as they have been put forward by creationist lawyer Wendell Bird in a video that creationists air on public access television stations. It was Bird who laid out the legal strategy in the early 1980s of promoting creationism as though it were a science. Bird argued the creationist side in the *Edwards v. Aguillard* case in which the Supreme Court overturned laws that had been based on that strategy. Since that defeat, Bird rarely speaks of "creation-science" and instead uses the term "abrupt appearance theory". Bird's arguments here are representative of the main creationist arguments, but they are not unique to him. Indeed,

most of these arguments were previously made by Great Commoner, William Jennings Bryan, in his antievolution crusade that led up to the *Scopes* trial.

By far the most common argument creationists make is to say that it is *unfair* for the law to exclude their view from the public school science classroom. Isn't it biased and one-sided, they challenge, to teach evolution to the exclusion of creationism? Bird argues that "The only fair approach is to let the children hear all the scientific information and make up their own minds". Phillip Johnson makes the argument in stronger terms, claiming that excluding creationism amounts to "viewpoint discrimination". (Johnson 1995, pp. 33-34) Bird tries to bolster the argument by appealing to *majority rule*, saying "The fact is that, contrary to all of the smoke, the great majority of the American public feels that it is unfair to teach just the theory of evolution". He cites polls indicating that a large percentage of Americans believe that "the scientific theory of Creation" should be taught alongside evolution in the schools.⁴ This majoritarian argument was the main plank of Bryan's position, and he too cited figures about Americans' beliefs. As Bryan saw it, "The hand that writes the pay check rules the schools". (Larson 1997, p. 44) A related argument involves claimed *parental rights* to determine what one's children will study in the public schools. If it is granted that parents have such a right, then a creationist parent should be able to insist that creationism be taught or evolution excluded.

Creationists also appeal to what is properly taken to be a prime educational value, *academic freedom*. Bird says:

To me the basic issue is academic freedom, because no one is trying to exclude evolution from public schools while teaching a theory of creation.

⁴ Such a poll question is misleading and biased, however, in that it assumes what is false, namely, that there is just *one* theory of Creation, and that it is a science.

Instead, the evolutionists are trying to exclude alternatives, while, in general, defending the exclusive teaching of evolutionism.

This way of putting argument is somewhat disingenuous, since creationists have indeed tried to exclude evolution from the public schools, and were very successful in keeping it out until just the past few decades. Moreover, they have subsequently tried to exclude it unless it were taught in conjunction with their view, and they continue to work to diminish or undermine its place in the science curriculum in whatever way they can. Bird is correct, however, that science educators do now usually defend the exclusive teaching of the scientific view, and this leads to his final objection. Mentioning organizations that oppose teaching creationism, he concludes that what they are doing amounts to *ensorship*:

They have a very specific desire to preserve the exclusive teaching of evolution and to exclude any teaching of a scientific theory of creation or a scientific theory of abrupt appearance. That's censorship in my view.

We should agree that, at first glance at least, some of these charges exert a powerful emotional pull upon us. No one wants to be seen as engaging in censorship or in unfair, discriminatory exclusion of a popular viewpoint. It is certainly incumbent upon professionals to take such charges seriously, and to examine them carefully to see whether they have merit. When we do this, however, we find that the charges do not apply or are irrelevant to the issue before us.

The notion of parental rights to determine what one's children are to be taught may sound attractive at first, but parents typically have no special expertise about specific subject matter, and they certainly do not have a right to demand that teachers teach what is demonstrably false. A recent poll showed that 44% believe the creationist view that "Humans were created pretty much in their present form about 10,000 years ago", but it is not relevant that a large number of Americans reject the scientific findings and do not

believe that evolution occurred.⁵ It does not matter what the poll figures are because matters of empirical fact are not appropriately decided by majority rule. Nor is it “unfair” to teach what is true even though many people don’t want to hear it. Neither are the schools “censoring” creationism; they are simply and properly leaving out what does not belong in the curriculum.

The charge that such a policy violates academic freedom is not so easily dismissed. One might reasonably dispute about whether academic freedom applies in the public elementary and secondary schools in the same way that it does in higher education, but prima facie there seems to be no good reason to think that this important protection should be afforded to university professors and not to others of the teaching profession who serve in other educational settings. However, academic freedom is not a license to teach whatever one wants. Along with that professional freedom comes special professional responsibilities, especially of objectivity and intellectual honesty. Neither “creation-science” nor “intelligent-design” (nor any of the latest euphemisms) is an actual

⁵ The 44% figure comes from a November 1997 poll. There has been no statistically significant change in the percentage of Americans who accept this creationist view since 1982 (45%), when the Gallup poll began to track beliefs about human origins. The social, political and demographic breakdown of the poll figures showed that “those most likely to believe in the *creationist version* were older Americans, the less well-educated, southerners, political conservatives (the New Religious Right?), biblical literalists, and Protestants, particularly in fundamentalist denominations such as Baptists.” (Bishop 1998)

or viable competitor in the scientific field, and it would be irresponsible and intellectually dishonest to teach them as though they were.⁶

In the previous century, the situation in science with regard to the question of the origin of species was quite different, but it cannot now be fairly said that the basic theses of evolution are scientifically controversial. There are currently no “alternative theories” to evolution that scientists take seriously, since the evidence has gone against previous contenders (including the forms of creationism held by 19th century scientists) and continues to accrue in favor of evolutionary theory. Evolution is in no sense “a theory in crisis”, as creationists purport. This is not to say that there are not interesting problems that remain to be solved, but that is true of every science, and such issues are of sufficient complexity that they are properly reserved for consideration at professional meetings, in

⁶ It should be obvious, but let me nevertheless state explicitly that in making these arguments I am taking it for granted that evolutionary theory is true. I mean this, of course, in the standard scientific sense of approximate, revisable truth; no one thinks that evolutionary theory is complete or that one or another of its specific elements might not have to be modified should new, countervailing evidence be found. Creationism is false in the basic sense that, whatever its specific positive commitments, it by definition rejects evolution. Most of creationists’ specific claims about the processes of the origins of cosmological, geological, and biological phenomena (among others) have been shown to be false as well, provided that we are able to judge these by ordinary scientific means and standards. Note, however, that I do not assume that this means that God does not exist; the larger question of whether a supernatural designer created the world is not answerable simply by appeal to scientific methods. I have discussed some of the evidence for these conclusions elsewhere (Pennock 1999, Ch. 2–3), and will not review them here.

the primary literature, and in graduate programs. Unresolved issues at the cutting-edge of science are well above the level that would be likely to be included in secondary school textbooks. What is included at the lower levels that concern us here is well confirmed and scientifically uncontroversial.

IV. EPISTEMOLOGICAL ARGUMENTS

Creationists of course refuse to accept the evidence that supports the various hypotheses of evolutionary theory. As they see it, one must look to revelation to determine what is absolutely true, rather than believing the “mere theories” of science. The basic issue, as they see it, is whose truths are to be taught. God help us, they say, if we fail to teach our children God’s Truth. Phillip Johnson has outlined a new legal strategy for reintroducing creationism into the public schools, arguing that excluding the religious perspective amounts to “viewpoint discrimination”. Citing the 1993 *Lamb’s Chapel* case, in which the court found that a school could not bar an evangelical Christian perspective in a class that discussed the subject of family relationships, Johnson claims that it is similarly improper to bar consideration of intelligent design when the topic of biological origins is discussed in science class.

One major problematic assumption behind this kind of argument is thinking that questions about empirical fact are simply a matter of one’s peculiar point of view, so that excluding one or another is “discrimination”, in the sense of subjective prejudice rather than the sense of objective assessment of differences. But there is a real difference between what is true and what is false, what is well-confirmed and what is disconfirmed, and surely it is a good thing for science to discriminate the true empirical hypotheses from the false by empirical tests that can tell which is which. Creationists also are interested in truth, but they believe that they already know what the truths are—indeed, as Johnson puts it, with what the truths “with a capital ‘T’” are. However, one cannot

ascertain truths except by appropriate methods, and creationists are typically unwilling to say even what their special methods are, let alone show that they are reliable.

A second major questionable assumption is that it makes sense to talk about “the religious” or even “the creationist” viewpoint. Professor Plantinga recognizes that truths must be ascertained by a justifiable method, but he argues that different epistemological assumptions may be taken to be properly basic. On that ground, he argues for what he calls an “Augustinian science”, in which scientists pursue their research along parallel epistemological tracks. Christians, he tells us, should do their science starting with “what Christians know”. (Plantinga 1997) The problem with this is that there is little that Christians can say univocally that they know.

Christians disagree, sometimes violently, about what it is they supposedly know. With the exception perhaps of Roman Catholicism, fundamentalist Christianity actually provides perhaps the broadest general consensus to be found, since it traces its roots to a series of publications at the beginning of the 20th century, the explicit purpose of which was to try to distill just “the fundamentals” of the faith. But even our brief view of the factions among creationists reveals the splinters that nevertheless form among even fundamentalists over disagreements about the smallest points of theology. (Intelligent-design creationists try to paper over this problem by remaining silent about the details and promoting the minimal positive thesis that God creates for a purpose. Though even this vaguely stated view may resonate with religious meaning, it is devoid of empirical content—it certainly neither opposes nor supports any particular view about the truth of evolutionary theory—and provides no method of investigation.) The problems increase exponentially once we look beyond Christianity, and bring Hindu, Pagan, Amerindian and other creationist viewpoints into the classroom, taking into account what these other religions take to be properly basic beliefs. If these theologically perspectival epistemologies are taken to stand on a par with ordinary natural science, then what we will be left with is a Balkanized science where specific private revelations that one or

another group professes to “know” and take as given will vie with one another with no hope of public resolution.

The knowledge that we should impart in public schools is not this private esoteric “knowledge”, but rather public knowledge—knowledge that we acquire by customary, natural means. The methodological constraints that science puts upon itself serve to provide just this sort of knowledge, and thus it is scientific knowledge that is appropriate to teach in the public schools.⁷

V. RELIGIOUS PROTECTION ARGUMENTS

It is in part because the esoteric knowledge claims of religions are of a different sort than the conclusions of scientific investigation, that we need the special Constitutional protection of freedom of religion. This leads to several additional arguments for excluding creationism from the public schools.

The main reason typically offered against the teaching of creationism is that it improperly promotes one religious view over others. We need not dig into the theological soils in which creationism is rooted to see that this is so. In their literature, creationists write as though they are defending the Christian faith and that the enemy consists solely of godless evolutionists, but in reality it is the religious who are more often in the forefront of the opposition to seeing creationism taught in the schools. The plaintiffs opposing the “Balanced Treatment” Act in the Arkansas case included Episcopal, Methodist, A.M.E., Presbyterian, Roman Catholic, and Southern Baptist officials, and national Jewish organizations. Though creationists attempt to portray their

⁷ I previously developed this position in a paper "Creationism in the Science Classroom: Private Faith vs. Public Knowledge" delivered at the 1995 Conference on Value Inquiry, the proceedings of which have yet to be published. I expand the argument in (Pennock 1999, Ch. 8), and so will not rehearse it here.

views as purely scientific and non-sectarian, other religious groups are not taken in by the disguise, and quite understandably argue that to sanction the teaching of creationism would indeed be to privilege one religious viewpoint over others.

One might argue that this unfair singling out of one view could be avoided by allowing *all* religious views into the science class. So should we then, following the creationists' pedagogic philosophy, teach them all and let the children decide which is the true one? This is hardly a wise course of action, in that it would make the classroom a theological battleground where different religions were inevitably pitted against one another.

Creationists and other conservative Christians often take issue with the Court's interpretation of the Constitution that set up the "wall of separation" between Church and State in the 1947 *Everson v. Board of Education* case. However, the idea of tossing all religions into the science classroom to see which wins, would violate what some take to be the original intent of the establishment clause of the First Amendment. The influential 19th c. Supreme Court Justice, Joseph Story, wrote that its main object was not just to prevent the exclusive patronage of some particular religion that would result from any national ecclesiastical establishment, but also "to exclude all rivalry among Christian sects..." (Larson 1989, p. 93). Religious rivalry and outright persecution was all too common in the American colonies when theocracy was the norm, and it seems reasonable to thank the secularization of the government and the Constitutional policy of religious neutrality in large measure for the fact that the United States has been relatively free of the sectarian violence that continues in other parts of the world. In a comparative religion class, religious differences could be respectfully described and studied, but in the setting of a science class, where the point is to seek the truth by submitting differences to the rigors of crucial tests, it is hard to see how conflict could be avoided.

Creationist law professor Phillip Johnson argues that this rationale of neutrality is "wearing thin" (1995, p. 28) in that teaching evolution is tantamount to governmental

endorsement of naturalism, which he says is the “established religion” (1995, p. 35) of the West. Here he is giving a variation of a complaint that creationists have made over the decades, that “evolutionism” is a religion, but this argument has already been tested in court, and evolution has been properly found not to be a religion. Neither is scientific naturalism religious.⁸ Scientific organizations might be tempted to get the religious tax exemptions if the court were to rule otherwise, but they could not in good conscience accept them.

Let me mention one further reason to oppose the introduction of creationism into the schools under this heading that I have not seen discussed before, and that some religious people might find to be compelling, namely, that introducing creationism in the science classroom would necessarily place their religious beliefs under critical scrutiny. Creationists typically teach that Christianity stands or falls with the truth or falsity of each and every specific claim in the Bible interpreted literally, or at least “robustly”. Fundamentalist and evangelical Christian parents who are familiar only with creationist literature (which invariably describes evolution as “merely a theory”, and seen to be obviously false to anyone not “blinded” by “naturalistic biases”), do not have any idea of how vast is the amount of evidence that supports evolutionary theory, and how weak are the specific claims of creationists. They also do not recognize that a few of what one might call “missionary atheists” are as eager as creationists to have the “Creation hypothesis” included in the public school curriculum, being confident that a side-by-side examination of the claims and evidence would destroy any student’s naïve beliefs in the religious view. In my experience, science teachers who teach evolution currently go out

⁸ I have previously rebutted Johnson’s claims about scientific naturalism, and shown how it is a methodological and not a dogmatic view in (Pennock 1996), and elaborated that argument in (Pennock 1999, Ch. 4 and 6).

of their way to be respectful of their students' religious views and not to challenge them. However, should the curriculum change so that they had to discuss the various "Creation" or "design" hypotheses—the Hindu, Amerindian, Pagan, and Raëlian versions, as well as the multiple Christian ones—as though these were simply "alternative theories", they could not avoid a direct confrontation.⁹ Given that we expect the government to neither help nor hinder religion, it would not be a wise policy to open the door to having children's religious beliefs explicitly analyzed and rebutted in the public schools in this way.

VI. EDUCATIONAL ARGUMENTS

In this section, let us set the above considerations aside and simply ask whether it would be a good educational policy to teach creationism if there were no other factors to

⁹ Creationists want to include only their own view, of course. In 1973, they convinced the Tennessee legislature to pass a law that would require public school textbooks to give equal emphasis to the Genesis view and to explicitly identify the evolutionary view of human origins as "merely a theory" and not a scientific fact, and attached an amendment so that the Bible did not also have to carry that disclaimer, and another amendment to expressly exclude the "teaching of all occult or satanic beliefs of human origins." In the 1975 *Daniel v. Waters* case Federal Court of Appeals immediately struck down the law as "patently unconstitutional," holding that claims to the contrary would be "obviously frivolous" and did not merit review, citing the amendments in particular and noting that no law could give such preferential treatment to the Biblical view of creation over "occult" ones. (Larson 1989, p. 136)

consider. To answer the question put this way we must turn our attention to philosophy of education more generally.

The choice of what to teach in the public schools must be made in light of the goals of public education. I take it for granted that one of the basic goals of education is to provide students a realistic picture of the natural world we share. Another is to develop the skills and instill the civic virtues that they will require to function in society in harmony. While there are several common purposes of this kind towards which all public education aims, the more specific goals, of course, will vary depending upon, among other things, the age of the student. It makes little sense, for example, to confront students with material that is beyond their developmental level. We also need to ask what is to be included when one teaches a discipline. What should be taught under the particular subject heading of *Science*? In particular, does creationism belong within that subject area?

If we think of science in terms of its set of conclusions, then it is clear that creationism does not belong. That creationism and science both have things to say about “the subject of origins” is not sufficient to say that the views of the former are a part of the subject matter we ought to teach. The specific hypotheses of creation-science have been rejected by science as the evidence accumulated against them, and the general thesis that “God creates” is not a hypothesis that science considers or can treat at all. Some scientists do discuss their theological musings—some theistic, some atheistic—in their popular writings, but research on the questions of the existence, or possible activities and purposes of a Creator simply is not to be found in the primary scientific literature. The only proper way to treat the specific empirical claims of creation-science in a science textbook is, thus, as an interesting historical footnote about hypotheses that have been long overturned.

But now let me return to Dewey’s important contention that to teach science properly is to teach not a collection of facts but a way of thought. Science education that

focuses only on scientific conclusions, and omits teaching scientific methods, misrepresents the nature of scientific inquiry and fails in its basic mission of preparing students with the best skills to function in the natural world. “Theistic science”, despite its name, rejects science’s methodology and therefore does not belong within the subject. “Creation-science”, “abrupt appearance theory”, “intelligent-design theory” and so on are the creationists’ cuckoo eggs that they hope will pass unnoticed, enabling them to garner the resources (and cultural prestige) of science and the forum of the science classroom for their own religious ends.

We should not haggle over mere terminology, but it remains the case that neither the conclusions nor the methods of creationism are properly described as “science”. Disciplinary boundaries may not be sharply defined, nor should we expect them to be, but they are generally distinguished by a characteristic order. It is because practitioners must adhere to constraints—be they the precedents of (tentatively) accepted conclusions or the procedures of inquiry themselves—that the notion of a “discipline” makes sense at all.

Could creationism be taught under a different heading, rather than as a science? If “theistic science” were to prove its value as an independent discipline, then educators might have to consider whether it would be worthwhile in relation to the educational goals of the public schools to include in the curriculum. Historically, theistic science had many centuries to prove itself, but in the end scientists concluded that they had no need of that hypothesis, and contemporary creationists have nothing to show for their attempts to revive the view that theology is the queen of the sciences. Intelligent-design creationists plead that they are only beginning their researches and plead for patience when asked for concrete results of their approach, and at present there is no sign that they will succeed in developing a fruitful discipline. It does not make sense to create a separate class to teach a discipline that does not exist.

The fact that intelligent-design and other versions of creationism have nothing positive to offer accounts for the pattern that we find in all creationist literature and in

proposed texts such as *Of Pandas and People*, namely, that they consist almost exclusively of pointing out purported explanatory gaps in evolutionary theory. The “Creation theory” or the “design hypothesis” is supposed to win by default. As we have seen, this dual model strategy has appeared in various forms, but the current favorite is in the creationist proposals to teach their view under the heading of “critical thinking”.

As mentioned above, there is some merit in the idea of considering the creation / evolution controversy as a case study to develop critical thinking. At the university level this can work, but there are several practical obstacles to implementing it at lower levels. The main problem is simply the sheer quantity of material that would have to be covered. It takes a semester-long college course just to give undergraduates an introduction to evolutionary theory, and one needs at least that much background to be able to begin to judge the evidence for oneself. It is also questionable whether high school students have developed cognitively to the degree that would make such an exercise worthwhile. Even some honors level college freshman are not sufficiently mature intellectually to begin that sort of evaluative project.

But there is a more important reason for not following the creationists’ proposal to teach critical thinking by criticizing evolutionary theory in the way they desire. Creationists are ideologues who “know” in advance what is the “absolutely true” answer to the question of origins, and they want the critical tools to be used against evolutionary theory rather than turned upon their own views. But it is simply not intellectually honest or professionally responsible to teach as though scientific conclusions were simply a matter of opinion, or that the creationist views of the origin of species are on a par with the findings of evolutionary theory.

Consider what the effect would be if we were to buy into the curricular framework that creationists propose; it would not be only evolutionary biology that would have to be put under critical scrutiny. Take, for instance, the subject of world history. There are any number of advocacy groups that, for religious, political or other

ideological reasons, advance some idiosyncratic version of history that is at odds with the findings of historians. If we accept the creationists' proposals regarding evolution, we should also be sure to present alternative theories, attach disclaimers to the standard accounts, and give equal time to the "evidence against" the conclusions of historical research so that the students can judge for themselves. In studying the assassination of President Kennedy, for example, we might begin by screening Oliver Stone's movie *JFK*, and then go on to consider the other theories, such as that Vice President Johnson masterminded his death, or that the CIA was behind it, or the Mafia. When studying the landing of American astronauts on the moon, we should probably issue a disclaimer and respectfully consider the views of those who believe that the whole event was filmed by the government in a secret Hollywood studio as part of an elaborate charade. When teaching about World War II we would need to give balanced treatment to those who hold that the Holocaust never happened and was just a Zionist propaganda ploy to gain sympathy for Jews.¹⁰ But such a notion of "fairness" and "balance" is absurd. It is certainly not sound educational philosophy.

We should be no less diligent in teaching the results of careful investigation of the history of life on earth as we are in teaching the history of our nation and the other nations of the world. Critical thinking does not mean indiscriminate thinking, but thinking governed by the rules of reason and evidence.

¹⁰ I mention such examples of conspiracy theories intentionally. As one reads creationist literature, from Morris to Johnson and beyond, one is struck by the regularity with which creationists describe scientists as being engaged in a deliberate conspiracy to deceive everyone into accepting evolution so that they might maintain their cultural authority, promote atheism, and spread immorality.

VII. PLANTINGA'S RAWLSIAN ARGUMENT

In this final main section, I turn to a new argument put forward by Alvin Plantinga in a paper he titled “Evolution and Creation: A Modest Proposal.”¹¹ Rather than directly address the question of whether creationism should be taught in the public schools, Plantinga turns the table and asks whether *evolution* should be taught. His central rebuttal against the arguments I gave above overlaps the earlier creationists' arguments claiming “unfairness” and “parental rights”. He links these by appealing to a Rawlsian notion of justice, claiming that every party to the social contract has a basic right (BR), “not to have comprehensive beliefs taught to her children that contradict her own comprehensive beliefs”. (Plantinga 1998) When Jonathan Swift made his own “modest proposal” that the Irish might solve the problem of starvation during the potato famine by devouring children, it was clear that he was being satirical. It seems, however, that Plantinga means for us to take (BR) seriously, even though its effects upon children's education would be much the same as Swift's. My contention is not, as Plantinga supposes in his paper, that science overrides (BR). I would not accept (BR) in the first place, nor should anyone who is concerned with justice.

Plantinga argues for (BR) as follows: “The teacher can't teach all or even more than one of... conflicting sets of beliefs as the truth; therefore it would be unfair to select any particular one and teach *that* one as the truth”. (Plantinga 1998) But this argument is seriously flawed; even if there is no way for everyone to eat the whole pie, it does not follow that there is no fair way to divide it or even to pick just one person who will get it. Plantinga appeals to the Rawlsian analysis of justice, but does not describe the reasons

¹¹ As noted earlier, Professor Plantinga's paper was a commentary upon mine and was also read at the December 1998 Association for Philosophy of Education meeting. All the quotations in this section are from the written version of that paper, which Professor Plantinga kindly provided me so I could write my reply.

that he thinks would lead free and equal people in Rawls's Original Position to agree to such a basic right. We need to see this reasoning before we can evaluate the justice of the proposal from a Rawlsian perspective.¹² Perhaps he thinks that it would go something like this: One knows that people are likely to disagree about "comprehensive beliefs" such as those profound religious beliefs about God and God's methods of Creation, but under the veil of ignorance one does not know what one's own view will be on such matters or whether, say, one would be in a position see to it that only those beliefs were taught in the schools. Plantinga must think that under such conditions rational persons would agree to institute (BR) as a defensive safeguard—since no one could be sure that their own preferred view would be taught, they all would want at least the right to see to it that another view that opposes it not be taught either. In other words, I supposedly would reason as follows: since I might be a creationist whose epistemology tells me that true knowledge comes only from the Bible and that evolution is contrary to God's Truth, I would want the right to exclude evolution from the schools to protect my children from what I would take to be its evil influence. But this reasoning is surely mistaken. Rational agents would never agree to such a gag rule as a basic right for a variety of reasons.

First, to do so would be to gut the curriculum, for even the most well-established facts may threaten some element of some person's comprehensive beliefs. As we saw, creationists' comprehensive beliefs put them at odds with not just the facts of

¹² According to John Rawls' influential view, justice in a pluralistic democracy is a function of fairness, with fairness understood in terms of fair procedures. (Rawls 1971) The "Original Position" is an abstraction of such a procedure in which we are to imagine ourselves as rational persons who are contracting to form what will be the basic social institutions, while under a "veil of ignorance" that prevents our knowing in advance what position we will hold in that society once it is constituted.

evolutionary biology, but also with the findings of most other sciences. Furthermore, because of the interconnections among scientific theories, opposition to what might appear to be just a single finding, necessarily involves opposition to many other ones as well. Nor are creationists the only ones that would make use of (BR); there are thousands of special interests groups that would use such a right to prohibit the teaching of specific facts or even whole subjects they objected to. One does not have to look far to find parents who would object to teaching about racial equality, the facts of reproductive health, or that even that the earth is round.¹³ Only the utterly trivial could have a chance of escaping the gag of (BR). No rational person would agree to such a policy.

Plantinga tries to avoid this conclusion by suggesting that we could teach things hypothetically. That is, while we could teach no account of creation as fact, we could teach them all conditional upon their specific epistemic base (EB). On this proposal, presumably a teacher would have to include a list of hypotheticals, along the lines that “If one starts with EB-YEC then God created the world and human beings 10,000 years old”; “If one starts with EB-Raël, then extra-terrestrials created human beings by genetic engineering hundreds of thousands of years ago” and so on. But this has similar problems. Though more people might accept this kind of hypothetical teaching, no doubt there would remain a significant number who would still object to having their children exposed to such ideas even hypothetically. On the other hand, even if we supposed that no parent would exert BR, rational agents would still reject the proposal in that it would

¹³ On biblical authority, schools in Zion, Illinois around the time of the *Scopes* trial not only rejected evolution, but also “Modern Astronomy” and its “infidel theories” of a moving, round earth. See [Schadewald, 1989 #2079] for a description of how the flat-earth view persisted in Zion schools until the mid-1930s, and continues to have a few adherents even today.

have the complementary problem—rather than gut the curriculum, it would balloon it to absurd proportions in that teachers would have to present a huge series of antecedent comprehensive beliefs (potentially every parents' specific EB), followed by the relevant consequents for each, again for all but the most trivial issue.

Second, under the veil of ignorance one should not limit one's deliberations to the scenario in which one was a parent with a comprehensive belief that he or she did not want challenged. The rational person would also have to think about being a child growing up in the household of such a parent. Sadly, we all know parents who are bigots or ideologues and others who are simply narrow-minded or ignorant. A good education may be a child's only window to a clear picture of the world and to an open future. To agree to (BR) would be to close that window. This would be a serious harm for the children of such parents. It would harm other children as well, all of whom could be deprived of a decent education, because the public schools could be forced to omit even basic scientific facts, simply because *some* parent found them offensive to his or her private religious beliefs. Indeed, it is difficult to think of any substantive fact that could pass unchallenged, if we grant with Plantinga that each person may appeal to (BR) from the warrant of her personal "epistemic base" (EB_p). Judging the question after considering the points of view of both parents and children, rational persons in Rawls' Original Position would reject (BR). Thus, a school policy that ignores (BR) is not unjust, for (BR) itself is unjust.

So, what *would* rational agents agree to? They would assent, I believe, to something very similar to our current system, along the lines I mentioned above—a separation of the public and the private. They would require that public institutions, like the public schools, not teach views based upon "private epistemologies" such as special revelation, because one cannot rationally adjudicate among beliefs that different persons purport "to know" simply "as a Christian" or a Hindu, a Raëlian, a Pagan, or whatever. Rational agents would agree to a basic right to hold such beliefs privately, but as a

defensive measure, would not want the government to support beliefs of this sort even “conditionally”, as in Plantinga’s proposal, since it would be impossible for schools to teach the myriad of private views without favoring some over others. Instead they would require that public institutions be constrained to public knowledge. In teaching about the empirical world, this means that the schools should limit their science curriculum to scientific findings—testable conclusions that we can rationally draw on the basis of observational evidence and the methodological assumption of natural law.

Although for such reasons I am afraid we cannot stomach the main entrée that Plantinga offers, perhaps we may still at least break bread together in another way. While we cannot agree that we should teach creationism even conditionally, we can agree that we should not teach science (including evolutionary theory) dogmatically. Scientific truths are never more than approximate, and always come attached with some greater or lesser degree of likelihood that depends upon their evidential support. While it may be reasonable to teach well-confirmed findings as “sober” truths, scientists must always remain cognizant that even these might have to be revised should new evidence appear that undermines their support; even “settled” truths may not legitimately be put forward as being absolute. The good science teacher will point this out. This is not the same as teaching science “conditionally”, as though its epistemic base were no better or worse than any private epistemology; rather it is just a straightforward acknowledgment of some features of its methodology. Knowing the rational limits of science, the rational person would agree not to have it portrayed as something it is not. It is not a religion and should not be taught as one. Its findings are trustworthy, but they are not dogma.¹⁴ Teaching science simply as a set of facts to be memorized can make it seem like a catechism, but teach science properly, by also teaching its methods of investigation, and dogmatism will

¹⁴ See (Siegel 1984, pp. 359-362) for a rebuttal of the creationist claim that teaching evolution amounts to indoctrination.

not be an issue. Creationists and others who hold to some private epistemology may still teach in their homes and churches that man does not live by bread alone, but surely the reasonable and just compromise is to agree that in the public schools we should content ourselves with sharing science's simple, basic fare.

VIII. THE ANSWER

In reviewing the arguments, we find many good reasons for excluding creationism from the schools, and few good reasons for not doing so. On balance, it seems clear that the wiser course is not to allow the conflict into the classroom. Should creationism be taught in the public schools? The answer is that it should not.

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