Creationists vs. Geologists and Evolutionists

A naturalist's thoughts about science and religion

Based on a talk presented by Ben Gadd
at The Grand Prairie College Festival of Science, October 2005

In March of 2003 I received a disturbing e-mail.

> Hello Mr. Gadd,
>
> My name is [withheld] and I am currently taking a high school philosophy class. My art teacher referred your name to me so I could ask you some questions. Over the past week our philosophy teacher has been talking about evolution, and some ideas of why it is wrong. (He truly believes it is wrong.) There are of course some holes in the theory of evolution, but not enough to toss it out the window.
>
> He has also made the claim that the Earth is only 5000 years old. Today we talked about Mt. St. Helen's and when it exploded. He brought up some very interesting points on some very interesting topics. Mr. [withheld] told us today that the Grand Canyon was formed over a couple of days, and that dragons (the ones from our fairy tale books) do exist. Could you please help me defend science and make good points? Here are some of the questions that arose today in our classroom:
>
> 1. How was the Grand Canyon formed? (and is it fact of how it was formed?)
> 2. Is there a possibility of it forming any other way?
> 3. How are coal layers/oil pits formed?
> 4. How long do they take to make?
> 5. Could dragons ever exist? (the ones from books, not lizards of today)
> 6. Could dinosaurs ever co-exist with human beings?
> 7. How old is the Earth?
> 8. How is it proved how old the Earth is? (not using radio-metric dating or layers of the Earth)
> 9. How long does it take mountains to form?
>
> We have discussed all of these questions in our classroom and our teacher believes that he is right without a doubt. He does not want to discuss things that he does not know about (how oil is formed and how long that takes) so our class is having a hard time trying to convince him otherwise. If you could please email me back with some answers or explanations you would be of great help!

Uh oh. The topics were familiar, seen often in literature issued by proponents of Christian creationism. I'm a naturalist with a degree in Earth science and a special interest in geology, so I'm always speaking to the public about geological time and the results of evolution, which means that I'm always having to deal with questions like these. I responded to the student right away, providing the answers that science has discovered.

Ensuing e-mails brought more questions, and soon I was invited to speak to the class. The course was being offered in a public high school in a nearby town. It was being taught as an elective by a shop teacher who was, indeed, a creationist. I spoke with him over the phone. He was friendly. Yes, he agreed that he was pushing the envelope on this. I could have gone to the school board about it. But he did have a genuine interest in

philosophy—his course outline included the ancient Greeks and so on—and he was teaching the subject on his own time.

I decided to keep an open mind. Perhaps the course was a good thing. Perhaps high-school students should be exposed to the issues surrounding the argument between scientists and creationists.

The teacher told me further that he wasn't really interested in debating me. Nor was I interested in possibly making him look bad in front of his students. (I'm a teacher myself and know how that feels.) He was happy to have me attend as someone knowledgeable about geology who could speak to whatever was on the students' minds.

I did attend, driving two hours through blowing snow to get there. The class was packed, because the teacher had invited students from the previous year to sit in. A student asked me if it was okay to videotape the proceedings. Sure.

The teacher invited me to speak first, so I began by reading some passages from a handout I had written just for this class, to show where I was coming from. One of the paragraphs posed a question:

> *Suppose we are listening in on a debate between two brilliant people. One is a Christian creationist, the other a biologist who studies evolution. Each is trying to show that the opposing ideas are wrong. The arguments go round and round. Who will win? Who is right? Which philosophy do you support, that of religion or that of science?*

"Let's actually vote, just for fun," I said. "How many of you would side with science's view of geology and evolution over the religious view?"

Surprise: nearly everyone was pro-science! Yet this high school served a rural area that was home to many fundamentalist Christians.

"Okay, now how many of you would side with the religious view?"

Only one student put up her hand. She sighed and looked resigned. I guess the teacher had not been very persuasive in trying to convince the students that Genesis was literally true.

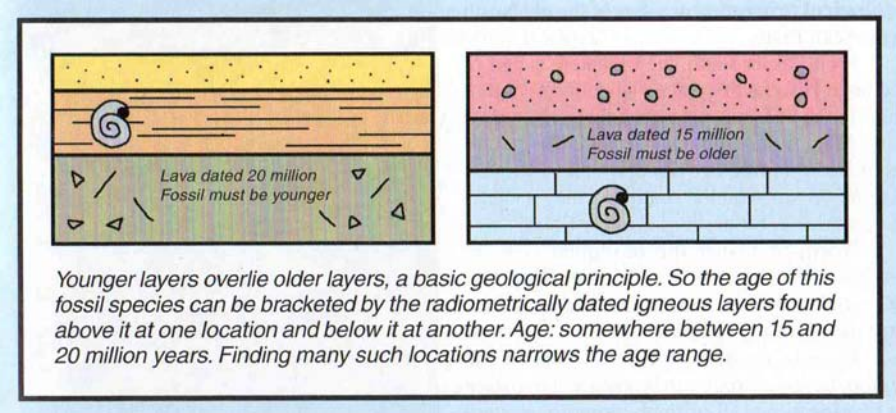
I asked for questions. Here was the first one: "Mr. Gadd, how do geologists know how old rock is? I mean, how do they *really* know?"

I explained that the work of Albert Einstein was essential for this. The students were impressed. *Einstein!*

Indeed, we can thank Einstein for reliable rock dating. His special theory of relativity gave us the mathematics for computing accurately the half-lives of radioactive elements. Any rock that was once molten contains radioactive elements, and those elements—isotopes, properly speaking—become part of various minerals when the rock solidifies. Then, through radioactive decay, the isotopes gradually change. By determining the proportion of an original isotope to one resulting from radioactive decay, you can work out the time that has elapsed since the rock solidified.

Creationists are always attacking radiometric dating. And most people do not understand how fossils can be used to assign ages to sedimentary rocks, which have never been molten. So that was the next question: "What about fossils? How can you tell how old a fossil is?"

I drew on the board, showing a layer of shale. Imbedded in the shale was a fossil snail. I told the students to think of this snail as an *index fossil:* a species that is easily identified and found in many places around the world. Further, to be a good index fossil it had to be a species that wasn't around for very long, maybe for only a few million years. The students laughed. Only a few million years? I laughed, too. "Geologists have this distorted sense of time …"



Younger layers overlie older layers, a basic geological principle. So the age of this fossil species can be bracketed by the radiometrically dated igneous layers found above it at one location and below it at another. Age: somewhere between 15 and 20 million years. Finding many such locations narrows the age range.

I turned back to the drawing and added a layer of lava below the shale. "Since the lava was deposited before the shale, the snail can't be any older than the lava. Not any older than 20 million years. We don't know how old the snail is. It could be a lot younger than 20 million years. But it can't be any *older*, right?"

The students nodded. So did the teacher.

Then I drew another layer of lava, this one above a layer of limestone. And in the limestone I drew the same species of snail. "In this case the limestone was deposited first, then the lava flowed out on top of it. Let's say the lava was dated to be 15 million years old. That means the snail can't be any *younger* than 15 million years. We are tempted to think that this species of snail existed only between 15 and 20 million years ago, but just to be sure, we look at lots of situations like this, using the same species of snail, and we never find an example that shows the snail to be older than 20 million years or younger than 15 million years. So we conclude that any rock containing this particular snail, anywhere in the world, is between 15 million years old and 20 million years old. By using the snail, we can date the rock."

The students got it. One of them thumped the desk. "Right on!"

And so it went. I answered other questions about how geologists once tried to deduce the age of the Earth from the saltiness of the sea (they were way off), how mountains are made, how plate tectonics works, how evolution works—and then the class was over. The teacher, who had spoken very little the whole time, thanked me. So did some of the students as they picked up copies of my handout. One of them said, "You really know your stuff, Mr. Gadd."

That was gratifying, but what struck me more was that I had learned this 'stuff' forty years ago in Geology 101 and Biology 101, yet it was still being taught today. Forty years is a long time in science. Basic concepts of geology and biology have been holding up well.

I walked down the hall with the creationist.

"So what do you think?" I asked him. "Was this worthwhile?"

"Well, you certainly had the answers they were looking for," he replied. He looked down.

"But how about you? Did this clear up anything for you?"

"No, I take my instruction from the Bible. I just wish I could do more. Kids are so mixed up today. All this drug stuff. Crime. Girls getting pregnant at 14."

"That concerns me, too."

We had reached the door. We shook hands. As I drove home (the snow had turned to rain), I thought about the long-running conflict between science and religion. Soon after arriving I turned my student handout into an essay. Here is the most recent version.

Science versus religion? This is a matter of fact versus belief. Beliefs that are incorrect should yield to scientific rigor, and most do, but not religious beliefs. Religious beliefs sustain themselves despite the lack of evidence for them. They are cultural, not logical. They don't have to be true. They just have to be shared among like-minded people. If your mom and dad brought you up to believe in God, and most of those around you believe in God, then you're going to find it difficult to disbelieve.

To my way of thinking, here are some of the more important differences between science and religion.

1. Science is about understanding the natural world. You gain information about it first-hand, or by referring to the work of others who have that first-hand experience. You use your eyes and ears and brain. You extend the reach of your senses by using equipment—laboratories, microscopes, telescopes, computers, space probes. You apply logic and mathematics. You believe that, through reason and effort, you can figure out how the natural world works. This is an article of faith among scientists.

In science, knowledge comes from gathering evidence and testing ideas. Something about the natural world catches your interest. For example, you see an insect walking across the snow in February. This puzzles you. How can it live at temperatures below freezing? You identify the bug—it's a type of crane fly, scientific name *Chionea*—and you check out the scientific literature about it, looking for an explanation. You can't find one. So you formulate an idea of your own: perhaps *Chionea* crane flies have some kind of antifreeze in them. You capture a few specimens and take them to a laboratory that can identify the various compounds in their bodies. The lab does the analysis and reports the results to you: the bugs contain unusually large amounts of glycerol, which is a natural form of antifreeze. You were right!

This is how science works. Ask a question, formulate a possible answer (the "hypothesis") and test it by gathering evidence. In science, things divine are not required. In fact, they are not acceptable.

2. Religion is also partly about the natural world, but it is about much more than that. In many religions the natural world is explained through accounts of the creation of the Earth and how the animals, plants and people on it came to be. Then religion goes further. It deals with the *super*natural, meaning things that lie outside our senses and beyond our understanding. Religion offers knowledge of gods, ghosts and demons.

Religion takes on difficult philosophical problems and provides answers. It tells us what is good and what is evil, how we should live our lives and how we should interact with others. It tells us what happens after we die. Divine intervention in the natural world is assumed, even desired. Most religions show us ways in which we can influence events, and some predict the future.

3. Rather than using evidence, religious knowledge is typically revealed from divine sources and handed down from one generation to the next, often in the form of sacred books. Reading these books critically is unnecessary and not encouraged. One need only believe and act accordingly.

In most Judeo-Christian religions the pressure to believe is strong. Same with Islam. In some religions one can be punished in various ways for *not* believing. In the Judeo-Christian tradition one can be punished after death, in hell. For believers who live righteous lives, heaven awaits.

4. Religious beliefs resist change. Religions pride themselves on how old their beliefs are and how long they have endured without significant alteration. Religious change is typically a painful process for those involved. For example, the Catholic Reformation of Europe sparked wars, caused countless deaths and brought on the horrors of the Inquisition. Religious intolerance has had a lot to do with the settlement of North America by people wanting to escape persecution.

5. Science, on the other hand, welcomes change. (Some individual scientists do not. I have heard it said that "science advances when old professors retire.") Scientific understanding improves as more knowledge is acquired, better tools are brought to bear and different minds do the analysis. Science is self-correcting. As time goes by, ideas that are shown to be wrong are replaced with newer, better ones.

In my career I have had the pleasure of working with scientists. On occasion I have done a little science myself, learning a few new things about the Canadian Rocky Mountains. Some of these observations have raised questions that I may never be able to answer, but I won't be invoking supernatural forces by way of explanation. In science, the statement "I don't know" is perfectly acceptable. Perhaps someone, some day, will do the work required to find out.

The gulf between science and religion is wide. It has to be. History has shown that science and religion—especially some branches of Christianity—have not been a good mix. That's because scientific discoveries have contradicted passages in religious texts such as the Old Testament. In response, many of the world's politically powerful religious bodies have held science back and oppressed scientists. Science has had to break free from religious control to become what it is today. The Enlightenment period of the 18th century, when intellectual and religious freedom swept Europe, provided that opportunity. Science has since become very strong, in no small part because, for its own good, it is completely secular.

What, then, does one make of "creation science"? The science/religion divide has not stopped some Christian believers in divine creation from trying to combine science with

biblical revelation—by relating the geological time periods to Genesis, for example—but without success. Failure is to be expected. The effort seems pointless.

Some fundamentalist Christians *attack* science, attempting to discredit well-established scientific ideas. They pick away at what they perceive as inconsistencies and unknowns. Yes, there are certainly inconsistencies and unknowns in science. Solving such problems is what science is all about. But these issues are far fewer and less serious than creationists make them out to be. The edifice of science is in no danger of crumbling. Nor is science out to destroy the edifice of religion.[1]

Yet the creationist camp is clearly anti-science. It keeps pressing its argument, which seems to boil down to this: science is wrong about the geological history of the Earth and the evolution of human beings, and thus we should all accept the explanations given in the Bible instead. Since there is no hard evidence for these concepts, they must be taken on faith.

Okay, lots of things can be taken on faith, but there are all the *other* biblical interpretations available, and all the other sacred books in the world claiming to be correct. How does one choose?

This is why Canadian public schools are secular. Adopting only the Christian view would be undemocratic, and observing the many religions represented among the students would be impractical.

As a nonreligious person I don't have any quarrel with most creationists. Let them believe whatever they wish. However, I *am* disturbed by the work of those creationists who call themselves "creation scientists." They promote an idea called "intelligent design," which is another term for divine intervention. Mainstream geologists and biologists have looked into the published results of creation science. They have found many errors. Essential information is often left out—easily accessible facts that any diligent researcher could have located in the scientific literature. Minus these facts, some creationist claims look plausible. But with the missing information included, such claims are obviously incorrect. For many examples of this, go to www.talkorigins.org.

Creationists who try to pass off flawed studies as proper science must know that they are violating a fundamental rule of the scientific method, which is to account for all the known information that bears on one's findings, leaving nothing out intentionally. To ignore relevant data is poor science. It won't stand up to peer review, which is to say that it won't be accepted as valid by eagle-eyed, PhD-level scientists who are acknowledged experts. To them, failing to tell the full story is a form of intellectual dishonesty. [2]

For this reason creation science has been labelled pseudo-science, meaning false science, and dismissed. For the many well-intentioned, sincere creationists who teach in religiously oriented schools, this is unfortunate. The source of their information has been

---

[1] Still, as Richard Dawkins explains so cogently in his book *The God Delusion*, scientists are free to examine religious claims objectively. When they do, such claims are routinely found to be unsupportable. Thus, science does tend to discredit religion. Dawkins presents convincing scientific and historical reasons for his view that religion is actually a bad thing.

[2] In 2004 I visited the Creation Evidence Museum in Texas (www.creationevidence.org), a project of creation science. I was not impressed. The exhibits were not credible, among them "human" footprints in Cretaceous rock (dinosaur-era rock). Such prints have long been known to have been faked, as the people who carved them have freely admitted. The people working at the museum must have known this. Yet they were telling the visitors that the carvings were natural. This was not ethical behavior.

tainted. I know some of these academics, and I feel for them. But next to mathematics, science is the most rigorous of the academic disciplines, and creation science will not become a widely accepted field of study until its practitioners improve the quality of their work.

What about scientists who also practice religion? How can they do that? Is it possible to accept both the scientific and religious belief systems? Indeed it is. The physicists Isaac Newton, Michael Faraday and James Maxwell all are known to have believed in God. (Einstein, thought by some to believe in God, probably did not.) I know geologists who do science from Monday to Friday and worship in Christian churches on the weekend. Somehow they manage to balance their beliefs.

Is it possible to show convincingly that our world was created by a divine being? After all, the idea of a universe that created itself from nothing is hard to swallow. Surely there must have been *something* there. To say it was God, though, begs the question. Where did God come from? Some sort of god-creator? And who or what created *that?*

This problem reminds me of an oft-repeated apocryphal story about an elderly person who, at the end of a lecture about the origin of the Earth, raised her hand to insist that our planet rested on the back of a giant turtle. When the speaker asked her what lay beneath the turtle, the person replied, "Another turtle, of course." And below that? "Ah, you're very clever, young man," came the retort, "but it's turtles *all the way down."*

That's amusing, but thinking about the ultimate origin of everything leaves me pasted on the front of science's speeding bus. The Big Bang, quantum mechanics, the concept of infinity, the idea that nothing, nothing at all, lies outside the universe, even though we seem to be *inside* it—well, it's just too much. It's frightening. My brain can't handle it. How inviting it would be for me, as for so many people the world over, to substitute comforting belief for things I simply cannot understand.

But I won't let myself do that, not when a few brave and brilliant minds have taken on the basic mysteries of the cosmos and turned paradox into paradigm. Stephen Hawking is one such scientist. This is a person who can study the bizarre workings of a black hole and reduce them to sensible equations. Perhaps someone with Hawking's intelligence and skill will one day bridge the gap between science and religion.[3]

In the meantime, I prefer science. There is a wonderful cleanness to it, an openness.[4] In good science, what you see is what you get.

What you get are answers to some fundamental questions. You want to know the purpose of life? Read a good general biology textbook, and you will find that life appeared on its own, as an inevitable consequence of our planet's chemistry, and it exists

[3] In 2003 Random House published *The Probability of God: A Simple Calculation That Proves the Ultimate Truth*, by physicist Stephen Unwin. The book concludes that there is a 67-percent chance that God exists. But this result depends on numbers assigned subjectively. So the conclusion of numerous philosophers and theologians still stands: the existence of God can be neither proved nor disproved.

[4] Well, not completely clean and not completely open. Science has always served the military, often in secret, to produce weapons and other tools of war.

simply to reproduce.[5] DNA replicates itself, and all else follows from that. What is this process we call "thinking"? It's neurons firing along pathways in the brain. What are emotions, what is the "self," and what is reality? More of what we merely perceive these things to be, depending on what's physically going on in our heads. (If you doubt the electrochemical basis of mental processes, consider the many pharmacological creations that will put you out of your mind.)

Sounds awfully cold, doesn't it, this view of the world? Yet it is a view I have come to accept, even to cherish. Here's why.

• ***For me it's science only—except in my imagination.*** I wasn't brought up in a religious family. My mother was a doubter, my father was an atheist, and I spent very little time in Sunday school. Still, out of interest I read some of the world's great sacred books—the Bible, the Koran, Teachings of the Buddha, works of Hinduism, the Book of Mormon—and found in them much that was interesting, even uplifting. I also found them to be full of things that were clearly untrue. Some of what I read offended me.

So to this day I have no religion. Nor do I miss having one. The natural world alone is quite acceptable to me. It has order. In most ways it makes sense. And that is enough. I seldom think about gods, ghosts, clairvoyance and other things supernatural. I am, in more ways than one, a *natural*-ist.

I will admit, though, to writing a novel in which the supernatural is front and centre. People ask me about that. They say, "Ben, how could you write a book like *Raven's End* and not believe what you have written?"

My reply is that it's only a story, and in a story the author can write whatever he pleases. In *Raven's End* it was important to the plot of the novel to invent a raven creation story and other things that I attributed to raven culture. I was assuming, just for fun, that these very interesting, very smart birds were capable of having their own system of beliefs. Who knows? Perhaps they actually do. It also pleased me to write as if raven mythology were true, as if some ravens could be immortal, as if animals could speak with one another, as if deities existed. Why not? This is the joy of imagination.

• ***A naturalist's world view.*** The real world, the natural world, is more beautiful and mysterious and surprising than anything a mere writer could ever invent. I love that world. As a naturalist, teacher and interpretive guide, I have made nature my life's work. Doing so has been satisfying and rewarding. The fact that natural history does not have all the answers doesn't bother me. Science can never have all the answers. Science has given us the Heisenberg uncertainty principle, which tells us that we cannot know everything.

This truth has set me free. I don't dwell on whether God exists or whether there is an afterlife. These things are neither provable nor disprovable, and to me they don't matter very much. What matters far more is what I understand of the world around me. Not what I *don't* understand, but what I *do* understand. This is knowledge with elegance and power. It's not religion, but it moves me when I think about it.

---

[5] Death, however, does have at least one purpose: it removes each organism from the ecosystem after a time, so that a new one can take its place, presenting slightly modified genes. Death is necessary for evolution.

For example, I know that my body will die, but I also know that part of me will live on in my offspring. My children have come directly from my wife and me, each from a single cell of her own (the egg) to which one of mine (the sperm) has been added. So our cells and genes—physical bits of us—have become our two boys. Our living tissue has grown with them, and it will remain part of them until they die.

Each of our children has also reproduced. Again, a physical part of them, plus that bit from us, resides in their offspring. All parents transfer life forward, and they have been doing so for countless generations of humans.[6]

In other words, ***yes, there really <u>is</u> immortality!*** Perhaps not life after death in the supernatural sense, but immortality nonetheless. This is stunning news, and it has come from the work of science. No wonder that so many religions have embraced the idea of reincarnation. One life has indeed led to the next, over and over, as undying DNA has been passed along from organism to organism.

The same kind of immortality reaches far, far back in time. My genes originated in the first living thing to use DNA as its genetic code. Every cell in my body contains DNA handed down from primitive life forms that drifted about in ancient oceans 3.7 billion years ago.[7] My body is built along the same basic plan as that of the first fish, which swam the Cambrian seas 500 million years back.[8] The blood that flows through my veins is a lot like the blood that coursed through the dinosaurs. I am descended from small mammals that escaped the likes of T-rex and *Velociraptor.*

Life's many-branched DNA lineage includes every organism that has ever lived, including me. This means that ***every living thing is related,*** however distantly. The bears and the birds and the wildflowers in the mountains out my window are all my relatives, and the notion delights me. I belong. I'm part of planet Earth's great family, an ecosystem so strong, so resilient that it has bounced back from several global disasters. In such numbers there is safety.

Which brings up another of important scientific finding. Gene by gene, generation after generation, ***the process of evolution has kept up with the astonishing changes the Earth has gone through.*** Over the eons, Earth's orbit has varied in shape. Its axis of rotation has tilted and wobbled. The continents have moved; ice ages have come and gone; asteroids have struck. In one deadly episode 251 million years ago, the whole planetary environment became poisonous and about 96 percent of all marine species were wiped out, along with 70 percent of the vertebrate species living on land. Yet the world was soon bustling with life again, much of it in the form of new species.

That's because DNA changes slightly with each generation. Mutations occur in the genes of our reproductive cells. Such alterations are caused mainly by errors in cell division and self-repair, by radiation damage and by the effects of substances and conditions in an organism's environment. These changes are random, not working according to any plan or toward any goal. Modified DNA produces modified life forms that try themselves out in modified circumstances. Most fail and die before they

---

[6] This is true whether we reproduce or not. Families share many genes, so if one couple is childless most of their genes will still be passed along by reproducing sisters, brothers and cousins.

[7] Latest dates: age of the planet, 4.6 billion; oldest evidence of life, 3.9 billion; earliest cells, 3.7 billion.

[8] We used to think that fish arose later, in the Ordovician Period, but recent fossil evidence from China suggests that the first fish species appeared way back in the early Cambrian.

reproduce, but some succeed and carry on new genetic code that is better suited to whatever the world is becoming. This is the process of natural selection, Charles Darwin's great discovery. Coupled with random mutation, it explains how the world's vast diversity of animals and plants, millions and millions of different species, have come to exist. As Darwin himself put it so simply and elegantly in the title of his most famous book, it explains *The Origin of Species*.

And here is a follow-up message, one that ought to convince anyone who doubts that evolution is a fact. ***Evolution is essential to survival on this planet.*** Without the means to modify the code and test it, that is to say, without evolution, life might not have been able to meet the challenge of a changing Earth and could have disappeared long ago.

Summing up, my thesis in this essay has been that the creationist attack on biology and geology is unfortunate. It some respects it is misguided, even fraudulent. Some fundamentalist Christians are stridently anti-science. Others try to pass off pseudo-science as the real thing.

What scares me is that so many poorly informed people buy the creationist argument, at least to the extent that they doubt the validity of well-established facts about the evolution of species and the length of geological time. This has disturbing implications. Fundamentalist religion has shown itself to be dangerous to intellectual freedom, especially when it winds up in control of education. Free academic enquiry is curtailed when closed minds control the funding.

Science is not seriously threatened by school-board fights over whether or not "evolution is just a theory." But we have to resist the erosion of science's right to be taught properly. When a legislature decrees that "intelligent design"—meaning creationism—has to be presented to public-school students as equal in scientific stature to Darwin's achievement, then an injustice has occurred. Religion is not the factual equivalent of science. Science is not the spiritual equivalent of religion. One shouldn't mix physics and metaphysics, astronomy and astrology, psychology and parapsychology. We owe it to our students to teach them the difference.

A final word. Despite my rejection of religion, please know that I run my life by some of the more commonly held Judeo-Christian ethics and rules of conduct. These are excellent conventions, time-tested and worth following regardless of whether one believes in God or not.

Of the Ten Commandments, one through four are meant for believers only, but my wife and I certainly practice commandments five through ten.[9] The Golden Rule—"Do unto others as you would have them do unto you"—is a terrific piece of advice, and there is a version of it in most any religion you care to name. Of all the Christian precepts, we particularly like a motto that one hears in Restoration Movement churches and among the Quakers. We try to live by it.

1. In essentials, unity (we all agree to abide by certain rules)
2. In non-essentials, liberty (for everything else we have freedom of choice)
3. In all things, charity (whatever we do, we are kind and we are fair)

[9] As interpreted liberally, in modern terms and in brief: be good to your parents and the elderly, don't kill people, be faithful to your spouse, don't steal, don't lie about others, and don't be jealous of them.

This is where religion and science share some common ground. What makes a better human being also makes a better scientist. I'll bet that the creationist high-school teacher who prompted this essay would agree with that.

***