THE FAITHANGLEFORUM

TRANSCRIPT

Science vs. Religion: What Scientists Really Think

Dr. Elaine Howard Ecklund
Rice University

Barbara Bradley Hagerty
NPR

November 2010

MICHAEL CROMARTIE: The subject we're dealing with this morning, I want to say, is one that we circle back to about every two years because, as you know, the topic of religion and science comes up a lot in the academy, but it also comes up a lot in public education. Professor Elaine Howard Ecklund has written this new book called *Science v. Religion: What Scientists Really Think*, which is a wonderfully unique take on the question because we usually read subjects on what religious people think about science. In this case we're going to hear what scientists think about religion.

Anyway, we are delighted to have Dr. Ecklund here this morning, and I've heard from her colleagues. They've raved about her work to me for over a year now, and we're thrilled she could be here.

We're also delighted that Barbara Bradley Hagerty could be here because, as you know, Barbara has written a *New York Times* best selling book on religion and spirituality and science. So it's wonderful to have you both here.

Elaine, thank you.

DR. ELAINE HOWARD ECKLUND: All right. Thank you, Michael, for having me here. It's an honor, and thank you, Barbara, for reading the book and responding to it.

It is a special privilege as an academic when someone actually reads your books. I found out that those of you around the table have that as an option, and that's a great privilege.

So when I was a graduate student at Cornell University, I was a research assistant on a big study on religion in American life, and one of the things I did is I went around, and I spoke to people in churches about what they think about things, and this is in upstate New York, a pretty rural area, and this woman I was speaking to, she says to me, "Where are you a student?"

I said, "I'm at Cornell University."

And she says, "Well, good Lord, I hope none of my kids go there."

And I was like, "Really?" I mean, Cornell is an Ivy League school. It's, you know, a place most parents would hope their children would get into.

And she said, "Well, if they go there I'm quite certain that they'll lose their faith because there are so many scientists there and they'll take them away from the Lord."

So that was one kind of experience. You know, as a graduate student, you're always thinking about other projects. So I put that in the back of my mind.

So another story, now fast forward, you know, another ten years after graduate school, I'm in a post doctoral fellowship, and I'm now embarking on a study where I'm actually traveling around the country interviewing scientists about what they think about religion, which is the beginning of this book in the end.

And I am traveling to this big school in the Midwest. I think it was either University of Wisconsin or University of Minnesota, one of those two places. I'm at a Best Western, you know. I'm down at the breakfast table eating my cellophane wrapped blueberry muffin, and this woman comes up to me, very Midwestern fashion, and she's like, "So, you know, what are you doing here?"

I'm like, "Well, I'm traveling around the country talking to scientists about what they think about religion."

And she's like, "Well, if you ask me" — of course, I had not asked her. I was very much immersed in my —

(Laughter)

DR. ECKLUND: — checking my e-mail or something, and she says, "Well, if you ask me," and she goes on to tell me anyway, "they don't have enough of it." Scientists don't have enough religion.

So you know, those kind of experiences, I think, give you, alongside survey data, a real sense of what Michael told us, is that at least, you know, maybe it's true; maybe it's not, but at least there's the perception out there that scientists are completely "areligious" and that they're even beyond being "areligious." They are against religion completely, right? If you care about religion, you want to keep your kids away from the scientists, right?

So those kind of experiences.

I want to tell you a little bit about what I am and what I'm not. So I'm not a natural scientist, not a historian. You've had Ed Larson here, but I'm a sociologist, and I think sociology at its very best often gives us research that's very deeply surprising and sort of challenges our world views, challenges and dispels common myths that we believe about ourselves and the world around us.

That experience talking with a woman who's afraid of sending her child to Cornell University contributed to my research, my most recent research, on religion, spirituality and ethics among scientists, research I've been working on for the past five years, where I've surveyed 2,500 natural and social scientists — I'll tell you a little about that, too — at the top U.S. research universities, and I've achieved a 75 percent response to the initial survey I did, which is very high for survey research.

I surveyed them at places like Harvard University, University of Chicago, top state schools like Michigan, Minnesota, Wisconsin, and I also followed up by having a lot of face-to-face conversations. So I took another scientifically selected sample of those I surveyed and traveled around and did 275 personal interviews, where I actually flew out to their offices and labs and, probably much like you do, carried around my little tape recorder and that kind of thing.

I've also developed a course at Rice University where I teach, which I think is pretty new and perhaps is not taught elsewhere. It's called "Science at Risk: Out of the Lab and into the Society," where I teach students about the ways in which science has an impact on society and also the ways in which societal concerns — and I think this should interest some of you — have an impact on science, and a big part of that course is talking about science and religion and that is something the students are always the most interested in.

These experiences have shown me that the public, even bright students at Ivy League schools and top private schools like Rice, are simply wrong about what scientists think about religion, and that this wrong perception, I'm going to argue today, I think has a lot of consequences, consequences in the public imagination that potentially hurt science and also potentially hurt religious communities.

So I'm going to address six topics that I hope will bring light to the public's perception of how scientists think about religion. First, I tried to think of how I would say this as a sound bite, but I could not. So I'll just throw it out there. Scientists are religiously complex.

So I would just say an aside. I'm totally an academic and it's wonderful to be among a group of journalists because lately some of my best friends in writing have been journalists because you all know how to write, but two words kind of have come to mind throughout this conference, which are academic equals slow, right; journalist equals fast.

So it has been, you know, at an academic conference, before people give a statement, they sort of lean their head back and like breathe deeply and collect their thoughts for two or three minutes and then put together this argument that starts with 65 prefaces, and you guys are like, "That's my point," you know, and I could really learn from that.

(Laughter)

So I'll hopefully become a changed woman after this conference.

(Laughter)

MR. CROMARTIE: You already are.

DR. ECKLUND: So let me — amen — so let me give you a little bit of history. So that's my statement. Scientists are religiously complex. Here's the history.

The idea that science and religion are necessarily in conflict has certainly been institutionalized in our nation's elite universities. So Cornell University, my own alma mater, I'm mono school, so undergrad and graduate degree at Cornell University, was established in 1865. Andrew Dixon White, one of the founders announced that it would be different from other universities of the time. It would be a safe place for science, protected from the authorities and constraints of theology.

The idea that science was oppressed by religion and would over time even replace religion was nicely encapsulated in the title of White's landmark volume, *A History of the Warfare of Science with Theology in Christendom*.

Incidentally, I have a friend who studies religion on campus, and Cornell University is one of the places now that has the most active student religious engagement on campus, which is sort of interesting.

In the early 20th Century, scholars who championed this conflict paradigm sought support for it in how scientists themselves approached matters of faith. Some of you may be familiar with this work from talking with Ed Larson, but the psychologist James Leuba argued in the early, early 20th Century that religion was a creation of the human imagination rather than a rational response to a divinely ordered cosmos, and Barbara's work nicely picks up on some of these themes, too, and addresses them. So I'm excited to hear what she has to say.

Leuba reasoned that scientists as those who know the most about the natural world would be the first to apprehend this truth and consequently the least likely to believe in God, attend church, those kind of natural indicators of religion.

Surveying the National Academy of Sciences, the most elite scientific body in the United States, Leuba, indeed, found that those scientists were much less religious than were other Americans by these conventional indicators. He reasoned it was only a matter of time until science would completely overtake religion.

Over the past 100 years scholars have continued to find that scientists are generally less religious than other Americans, pointing to this as proof that religion and science remain inextricably in conflict.

So it's on us again. We have, you know, discussion of the God gene, embryonic stem cell research, and the kind of religious implications that has, teaching evolution in public schools, which I understand you've really discussed here, and the religion and science conflict is really returning with vengeance in the early 21st Century.

The debate, of course, propelled by these current controversies is especially poignant in higher education where I make my living. In particular is the enemy of religion and the friend of science, and many Americans see scientists as not only lacking faith, but as actively opposed to religion, further sustaining this conflict paradigm.

Yet when we bring survey research and in depth interviews into this light, we see somewhat of a different story. When we look at religion in a traditional sense, in my study about 50 percent of scientists identify with one of the major world traditions. So some version of Protestant, Catholic, Jewish, Muslim, and a little more than 50 percent do not have any religious identity, would call themselves religious "nones."

But we also have — we also have surprising categories, right? This is the complexity thing. I'm still on point one. A little over 30 percent of scientists consider themselves atheists. No surprise. Another 30 percent, agnostic, although agnosticism, I think, means something very different among scientists than it does in the general public. But among scientists, one in five of the atheist scientists considers themselves a spiritual person.

To give you an idea what this might look like, I'll tell a story of one of the scientists I interviewed who I call Eve, who's a chemist, and she calls herself a very committed spiritual atheist, which she distinguishes from those who are just atheists in the scientific community. She does not believe in God, as atheist implies, but says that she craves a sense of something beyond herself that provides a sense of purpose, a meaning, a moral compass, what she calls a codified world view.

She sees herself as having an engaged spirituality, one that motivates her to live her life differently. She does not take money from the Department of Defense, for example, because it's too linked to the military for her, and she attributes this to spiritual reasons and her spiritual philosophy.

So scientists are not all atheists, and even atheist scientists, I think, are different sometimes than we might think. Scientists have areas of religious overlap and religious difference from the general public. I'm sure we'll pick up on this in the question and answer. The biggest difference is in the proportion of evangelicals. About two percent of scientists see themselves as evangelical, believing that the Bible is the authoritative word of God, salvation through faith in Jesus Christ, and evangelizing to others about their faith, compared with and depending on how you ask that question about 28, 30 percent of the general population.

Interestingly, if I ask the question a little bit differently, if I don't say, "Do you name yourself an evangelical?" if I look at what kind of religious traditions they're a part of and beliefs and things like that, the number rises a bit, about doubles actually. So if you care about having a lot of evangelicals in the academy, this is not a statistic to write home about, but it does show this sort of doubling that there is some perception that it's not okay to call yourself an evangelical. Like the label is not a good thing. There are some that give some credence to that idea.

There's the biggest overlap between mainline Protestants, Presbyterians and Episcopalians, for example, and scientists. About 15 percent of scientists and 15 percent of the general population are part of that category.

Interestingly, given the conversation yesterday, about one in ten scientists at top universities is a Catholic when compared to a little over a quarter of the U.S. population. So, again, not a gigantic number, but I compared my survey results to a survey done by the Carnegie Commission of Higher Education 40 years ago, and the proportion of Catholics has risen among elite scientists over the past 40 years, which there's lots of historical reasons, et cetera.

But I found through interviewing Catholic scientists that they were the ones who had a very well thought out idea for how they connected their faith and their science much more so than the Protestants. That was interesting.

Second point. Irreligious scientists use religion. I don't talk about this in my book, but in a paper I'm now working on from these and other data but have yet to publish, I show some of the ways that irreligious scientists use religion, and I make no judgment about this, although reviewers want me to.

It's interesting. I get two kinds of reviews to that statement. One from academic reviewers is, you know, why don't you condemn them? They're hypocrites, right? They still need religion even though they say they're atheists, and the other is like, you know, there's no place else you can turn for a good time other than religious communities. So it's very interesting, very different kinds of reviews.

So scientists go to church often or participate in other kinds of religious organizations even if they're atheists. For example, about 20 percent of atheist scientists who are parents attend religious services regularly. This is particularly salient when they become parents.

Scientists stressed — I asked them, you know, what are the reasons you do this — they stressed spousal influence, of course, being married to a religious spouse; looking for a place of community, feeling like there's not good options for community when you have children outside of religion; and also the uses of their resources from their identities as scientists. They want to serve — scientists really prize consistency, and they want to provide their children with religious choices. So the idea that just because I am an atheist doesn't mean you have to be, said child, and they want to provide them with a whole range of choices.

And the second way that irreligious scientists utilize religion is when thinking about science ethics, particularly scientists who have been raised in a religious tradition and have since, you know, decided not to be religious. They think that it might be helpful. They bring religion back up when dealing with complicated ethical issues that involve science, especially citing examples ranging from avoiding misrepresentation of data, so

issues of research integrity, to things like human genetic engineering, how we think about that from a moral perspective.

So when people in the general public do this, when they, for example attend religious services without believing in the tenets of the religion, Nancy Ammerman, who is a sociologist of religion at Boston University, calls this Golden Rule Christianity. So, you don't really believe, but you think, you know, there's some good rules in Christianity.

The scientists I study were somewhat different. They utilized religious tenets without actually attending services and even sometimes while maintaining stance as an atheist, which I thought was very interesting.

Third, I also studied how religious scientists think about their faith in public realms when they're religious. For example, when I asked about expressing religious beliefs in their academic life, I found that religious scientists often practice what I call a secret spirituality. The majority of religious scientists are rarely public about their views in the academy. They often try to keep their faith to themselves because of the perception that other faculty in their departments think poorly of religious people and religious ideas.

Charles O'Reilly and Jennifer Chapman I think are at Stanford. They are business culture scholars and talk about the differences between strong cultures and weak cultures. So strong cultures within organizations are characterized by what they say is a system of values widely extended and intensely shared. Within a weak culture, shared values are fewer and the ties that they create among group members are less potent.

You see this a lot in research on women, for example, in business organizations. So there might be women in a Fortune 500 company in leadership positions, but still the sort of culture of the organization is that you still make sexual jokes even when women are present and everyone just kind of laughs along. It's just sort of a culture of not treating women well. So there's a lot of research on that.

So if the desired outcome of an organization, for instance, is economic in nature to make more money, then groups with strong cultures are going to be more successful, right?

Intense ties sort of foster common values, getting to the bottom line, and therefore high economic performance.

But what about when organizational goals are not economic in nature? What if the desired outcome, for example, is expanding understanding like it is in an educational setting or the spread of knowledge? Is a strong culture that suppresses discussion of religion, I think we need to ask ourselves, the best one for an academic science department?

So here's what my evidence shows, that scientists perceive that a strong culture governs discussion of religion in the academy. One characteristic of this strong culture is that it's generally considered better not to discuss religion than to discuss it. When religion unavoidably comes up, such as when discussing news events, right? — I mean, we're all religion journalists or think that it's okay to discuss religion in the news — the conversation ends abruptly or everyone, religious and nonreligious alike, tacitly agrees that religion is generally negative and has a negative relationship to science. It's sort of what we all do in the culture, or at least that the subject is very delicate and best avoided.

The hallmark of a strong culture is that there's widespread public agreement or appearance of a public agreement without — certainly about the issue of suppressing religion even in the context of individual dissent. Strong departmental cultures make religious scientists feel that they cannot openly talk about being religious because they might face negative sanctions from their colleagues, whether or not this is actually true.

When religious individuals participated in and upheld this strong culture surrounding religion, they are then sort of perpetuating it. So I'll give you an example of one, a physicist I interviewed, Janice, who's an example of a scientist who said that she feels trapped in a closeted faith. She landed a job early in her career at a prestigious university, and of all the physicists of the elite research universities where I interviewed scientists, only nine percent are women, actually a discovery that led me to another study that I'm doing on the experience of women in science. So Janice feels marginalized in the world of physics as a woman, as a young person — she's quite young — and, most germane to our discussion, as a religious person.

When I asked Janice — so here we are. We're in a room, door closed. I asked her to describe her particular religious beliefs. Her long silence becomes uncomfortable. She later explained just how difficult it is for her even to have conversations about religion in the academic setting. She knows a few others in her department or broader university are religious, but said that they talk about their faith only occasionally, and then only what she put as offline, her shorthand way of saying these conversations simply don't occur in the work environment.

She said, in particular, that these recent controversies about intelligent design have made her even more reticent, reluctant to discuss religion with her colleagues. She said, "I think of academia as not always an accepting environment. Intelligent design has made it a whole lot worse. Intelligent design has made it really hard to be a religious academic because they polarize the public opinion, making it seem as if you're either religious or you're a scientist."

Janice went on to say that to let others know that you're religious might undermine how colleagues view your academic work. So I asked her, "Have you personally experienced this sort of discrimination?"

She quickly added that she has not because no one actually knows she's religious. See, so it's not like she's even experienced it personally, but she has such a strong perception that she can't talk about it.

So regardless of whether or not scientists do or would experience religious discrimination, to paraphrase sociologist W.I. Thomas' famous maxim, which actually is known as the Thomas Theorem, if men define situations as real, then they become real in their consequences.

Janice perceives that the climate surrounding religion is so hostile that if she were to talk about her faith she would bear the brunt of negative sentiments that would affect her ability to succeed as a scholar.

I think there's some evidence for her perception actually. For example, she recounts the experience of talking with colleagues about teaching and her colleagues are dismayed

that students come to their university with much less background in math than should be expected, and a colleague quips to Janice, "It's stupid intelligent design. It's stupid Christianity."

The fact that Janice's colleague immediately assumes that all Christiansreject evolution makes her personally uneasy about being open about her faith.

Fourth, I asked scientists how they practice science within their faith community, thinking that perhaps in their actual communities of faith they feel the sort of warm welcome where they can be themselves. Not so.

I found that scientists within faith communities practice what I call a secret science where they are hesitant to discuss what they do as scientists for fear of offending people in the pews who are not scientists, and these were mostly in Christian communities. I think it's accurate to say pews.

They may not have tried to discuss their work once. They may have tried to discuss their work once and found that it didn't go over well. Maybe they brought up something about evolution and found that their views were not well met, and then they decided that they just were not going to talk about it anymore, and they sink into a sort of secret science within their faith communities. While this is not something that they're generally pleased about, they didn't know how to change.

Fifth, I found that social and natural scientists are very similar in how they think about science. So I actually started this study in part to compare natural and social scientists. So social scientists, like in my own field of sociology, or in political science, are often thought of as being kind of the village atheist. We're supposed to be, you know, especially virulent and negative against religion, especially unfriendly.

And natural scientists, our researchers have found in the past, are ironically more religious than social scientists, and so people will say, "Well, what's that about? It must be because social scientists are so politically liberal," and that's correlated with being against religion.

My work actually found no religious differences between the natural and social scientists. I should add the one caveat that economists were slightly less religious than other disciplines, but I don't know what to do with that. Do with that what you will.

Max Weber, a founder of sociology, described people he called carriers who were sort of types representative of the various classes who were like the propagators of the major world faiths. Carriers perpetuate an ideology that can seem almost salvific in kind, which most readily conforms to their social position.

Scientists have been perceived in the academy as sort of carriers of a secularist impulse, a group responsible for building the modern research university, which is completely at its core based on science and undermining religious authority by their success in deciphering the mysteries of the natural order without recourse to supernatural aids or frameworks.

On the one hand, I found that Weber's ideals are still true. As I said, I started out this study by examining both natural and social scientists and found that the social scientists in the study, like economics, psychology, political science, my own field of sociology, had absolutely no problem with me labeling them as scientists. Now, natural scientists do not necessarily see social scientists as scientists.

The relationship between these two groups is sometimes uncomfortable, but they were uniformly of one mind in the defense of science. Both of these fields saw themselves as really engaged in a search for the truth of scientific fact, and actually it was surprising to me how closely these social scientists' conceptions of science and the general scientific fact meshed with the views of the natural scientists.

The most reflective of the natural scientists I talked with wanted to actually move beyond what they call the "scientism," what the philosopher Gregory Peterson and others have seen as an unthinking capitulation to a totalizing scientific world view, and beyond a sort of unthinking relativistic post modernism which they see as characteristic of some corners of the humanities, and instead what scholars now see as this post positivism, which takes seriously the desire to see that science has truth but not total truth, and that science needs the thinking humanities like philosophy, theology, literature to make sense of the

most pressing issues facing science today, like science education, how best to reach out to the general public, how to think about a robust science ethics, those kinds of issues.

Sixth, I think these findings show that understanding religion is crucial to public science and our efforts along those lines.

As we've discussed, there are huge religious differences between the religiosity of the public and scientists, like the 14 times more self-identified evangelicals.

And more than 50 percent of Americans agree, according to recent surveys put out by — Baylor University did a survey along these lines. The National Science Foundation has done work. Fifty percent of Americans agree that we depend too much on science and not enough on faith, and that scientific research these days doesn't pay enough attention to the moral values of society. And 25 percent of the American public thinks that scientists are hostile to religion.

Religion and, more importantly, the intersection between religion and science cannot be ignored by scientists who care about the public's knowledge of science and its propagators. These scientists should set forth an agenda for dialogue and de-privatization of discussions about religion, one that emphasizes a more nuanced view of religion, one that's more accurate to the reality of the American public, and a more realistic view of the limits of science.

Those who did want to talk with members of the general public about science face what they call somewhat of a language deficit. Since they did not learn a religious vocabulary as children often, they find themselves without the right tools with which to engage religion, and I think that's where your work is so, so vitally important as you're really educating. You know, scientists are part of the public. You're educating them about the depth of religion in American society.

Such scientists do not need to become religious believers, I would argue, to have more productive discussions about science with people of faith, but they do need to know more about religion from an intelligent perspective, at least basic facts about the variety of the world's traditions, the kind of diversity that the world's traditions have with relationship

to science so they might more effectively engage with a variety of religious people in a way that advances science.

Scientists routinely criticize the American public for their lack of appreciation for science relative to that of other developed nations, and I agree with them, but to better engage the broader public with science, scientists must be more introspective about their own relationship to religion, how they talk to the broader public about the connections between religion and science.

Regardless of what scientists personally believe about matters of faith, there's a surrounding social environment, right? Public debates about intelligent design, which you've addressed here, human cloning, public funding for science, science education. That simply can't be avoided.

Scientists tend to view the impact of religion on science education entirely through a lens of conflict or deficit, often blaming Americans' poor understanding of science on religion, arguing in particular that fundamentalist forms of Christianity inhibit science learning.

There's some evidence for these accusations. About 40 percent of Americans believe that creationist accounts of earth origin should be taught in public schools instead of evolution and another 20 percent think that some form of creation should be taught alongside evolution, and we can talk about all of that later if you want.

In comparison, nearly all of the scientists I surveyed think that evolution is the best explanation we have for the development of life on earth. As debates about teaching intelligent design in public school classrooms continue to rage, outspoken scientists have lashed out, perhaps angered by what they see as an outright attack on evolution.

But I quote political scientist Sanford Lakoff who says that much more needs to be done by scientists to overcome public indifference or outright hostility to science. It's clear that scientists at elite universities do shoulder the responsibility of translating science to the broader American public. They've signed up to be educators. But this public includes a great many religious people.

Beyond their own personal attitudes towards religion, scientists in my research revealed that they know little about how their own colleagues came to their views on religion and much less about what drives the typical American worshiper. Scientists without faith, I think, would get better information to think through how to engage the believing public and their own religious scientists about matters of faith and science. Without this knowledge to serve as a bridge, boundaries can't be crossed. The benefits of common dialogue are wasted, and potential allies, I think, for science remain virtually untapped within a religious American public.

MR. CROMARTIE: Thank you. Thank you.

Well, many of you already know Barbara personally, but just to remind you, she's the Religion and Culture Correspondent for NPR, and she has written a *New York Times* best selling book called *Fingerprints of God: The Search for the Science of Spirituality*.

Thank you, Barbara.

BARBARA BRADLEY HAGERTY: Thank you.

And, Elaine, really thank you so much for writing this book. I think before I read about your book and read your book, I think the statistic that I had that I had seen was that 92 percent of elite scientists at the National Academy of Sciences did not believe in God. So only eight percent believed in God, which is the obverse of the American public, and your research has shown that when people can talk anonymously and when their careers aren't on the line, there are actually more of them out there than you would think, which is probably like journalists, right?

Although I have to say that journalism, I think, has gone a lot further than science. I think the discussion in journalism — people talking about their faith or at least acknowledging that faith isn't stupid — is more elevated and tolerant among journalists than it is among scientists, having covered the science-religion debate now.

Elaine did a terrific job chronicling her research and attitudes toward religion, and I can't really add to that. And so Michael gave me permission to talk about what *I* want to talk

about in this debate — so I want to turn this around a little bit. Instead of thinking about how scientists view religion, I want to talk today about how religious believers might view science — or what they need to know about science, and specifically, the challenges that science presents to core religious beliefs, core religious doctrines.

I think the "God of the gaps" has been shrinking for quite a while now. I think we understand thunder and lightning without resorting to Zeus, and we know that epilepsy is caused by abnormal brain activity, not by demon possession. I think most people in the room would accept that evolution explains how we moved from amoeba to man, and science, therefore, has kind of nicely whittled down the God — God taken *literally*, the God who springs from a literal reading of the Bible. That's been going on for some time.

But what I want to talk about today is some other ways that discoveries in science are challenging, though not necessarily undercutting, religious doctrine. I want to focus on three.

First, science raises questions about whether one religion has an exclusive claim to truth.

Second, science is challenging whether believers can say that certain behaviors are sinful and contrary to God's will. And I want to talk specifically about homosexuality.

And third, science is disputing this notion of free will. And if we don't have free will, then what happens to sin, which is basic to religious doctrine?

I personally think we're in the middle of a theological revolution. I mean, humans have closely tied their moral beliefs to religion for thousands of years, and it's really only been in the last few decades that science has begun to tease those beliefs away from religion, away from Scripture, away from what religious believers consider to be God's commands.

And I think that chipping away at what many people think is the bedrock of morality has real implications, especially here in the United States, where you see that how you read the Bible often drives the culture wars or can tip the electoral balance.

So I think these challenges by science to religion are really no small thing, and I think there's a big question about what's going to fill the void.

I began thinking about religion's exclusive claim to truth when I was researching my book on the science of spirituality, and I talked to a lot of people who had had spontaneous mystical experiences who told me that they had suddenly and without warning touched another dimension of reality and it had transformed them as a result.

And dozens of people told me their stories, and what was interesting was that their descriptions of this encounter with another reality were very similar. Their descriptions of this "Other" that they encountered — and they usually didn't use the word "God" — were uncannily similar.

They described things like: a definite but gentle presence drawing them to it; an overwhelming light; a nonverbal voice encouraging them and telling them that all would be well; a sense of having no boundaries, that they were connected to all things; that this was an eternal moment. Interestingly, people who had near-death experiences also described the very same phenomenon.

But here's the rub. In general there was no religion associated with this "Other." I interviewed Catholics and Protestants and Jews and Sufis and Buddhists and people who said they were religious, spiritual but not religious, and after those experiences that they had, they might still go to church. They still might go to synagogue. They might go to the mosque or whatever, but no one claimed that his or her God was the only authentic God. They all said they had shelved that notion.

It was as if they had witnessed God from different angles, during that transcendent experience, and they came to conclude as a result of that this "Other" was too big for a particular religion, and what religion was, was an attempt to understand the spiritual experience. But a Jew or a Buddhist was not going to deny the reality and the authenticity of the Christian experience, and vice versa. I found this kind of uber-tolerance after these people had dramatic spiritual experiences.

Later, I encountered this same idea in science — that is, that no religion has an exclusive claim to truth — when I was talking to scientists about the neurology of spirituality or what happens to the brains of people when they are having an ecstatic moment, moments which they consider a union with the divine. Several scientists are looking at

this, including Richard Davidson at the University of Wisconsin, and Andrew Newberg at the University of Pennsylvania. It's a new area of science called neurotheology, and a few years back, Andrew Newberg came and talked to this group in Key West about it, and he did a terrific job.

Newberg has been studying the brains of very religious or spiritual people for several years. I call these people "spiritual virtuosos" because they spend hours every day in prayer or meditation. These are like the Olympians of prayer and meditation. They're not like you and me.

(Laughter)

He studied Buddhist monks. He studied Carmelite nuns. He studied Sikhs. He studied serious practitioners of a few other religions, and here's what he does. He asks these people to meditate or pray. You meditate (in the case of monks) and pray (in the case of nuns) or chant (in the case of Sikhs), and after a few moments when they're in their zone, he injects a dye that shows the blood flow in their brains. They're hooked to an IV, and he injects a dye, and the dye goes into their brains, and a few minutes later he puts them in a SPECT scan which then takes a picture of their brain essentially in that ecstatic moment. It's like a freeze shot: This is what a nun's brain looks like when she's communing with God.

Certain parts of the brain light up and certain parts of the brain go dark in this moment, and what Newberg found was that the same parts of the brain lit up or went dark in all the subjects. It didn't matter if you were a Catholic or a Buddhist or a Sikh. The frontal lobes — the executive part of the brain that has focused attention — that part of the brain lit up because the people were focusing their attention on the prayer or the meditation at hand.

Now, another part of the brain, the parietal lobe, went dark. The parietal lobe is a part of the brain that orients you in time and space, and so when this part of the brain goes quiescent, the nuns and the monks and the Sikhs felt their boundaries drop. They felt — this is what they told me — they felt at one with the universe or God, depending on your

particular doctrine. They felt timelessness and spacelessness. As one monk put it, it's as if the present moment expands to fill all eternity. It's as if I was living in the eternal now.

Now, what's interesting is that what the brain is saying is exactly what they're feeling. It's not surprising, but it's kind of interesting. Not only are they feeling the same things and the brain is kind of doing the same stuff, but the same physiological process happens even though these people hold very different doctrines. It's as if the nuns use MapQuest and the Monks use Google Maps and the Sikhs use Yahoo, and they all go to the same place using the same routes. They have the same sense of transcendence using the same neurological routes.

In other words, from the point of view of the brain, spiritual experience is spiritual experience. Doctrine doesn't matter.

I'm not suggesting that people throw out their faith simply because of some brain scans. But I do think that the basis for religion is spiritual experience, an encounter with the transcendent, whether it be Moses and the burning bush or Jesus or Paul on the road to Damascus or Mohammed or Joseph Smith or Mary Baker Eddy. Religions begin with spiritual experience, and the people who tend to keep going with religion are those who have spiritual experiences. And now the studies suggest at least neurologically that spiritual experiences are really similar — and so perhaps what science is saying is that the distinctions between religion are more artificial than true believers want to admit.

Interestingly, with all of these ideas, what we're seeing is the science and culture are mirroring each other.

For example, according to polls, the notion that there is only one road to God has shifted dramatically. We had Bob Putnam and Dave Campbell here last year, and they had found in their book *American Grace* that nearly two-thirds of evangelicals under the age of 35 believe that non-Christians go to heaven.

By contrast, only 39 percent of older evangelicals, people over 65, believe that there's more than one way to God. So what's happening is science and sociology are beginning to mirror each other.

The next thing I want to look at is how science treats behavior proscribed by the Bible and specifically homosexuality. This is obviously a major issue for a large segment of the population who read the Bible literally, such as evangelical Christians and black Protestants, and this behavior has sparked a huge debate in California and churches like the Episcopal Church have split up over it.

But for the most part it's not because people dislike gays. Rather, conservative believers see this issue, as kind of the camel's nose into the tent — as an assault on the moral authority of the Bible, and (to use another metaphor) if you pull one thread, the whole sweater unravels. That's one of their major problems with homosexuality.

Interestingly, young people, even young evangelicals couldn't care less about this issue. Fifty-two percent of young evangelicals support gay marriage. Now, that's compared to 22 percent of older evangelicals who support gay marriage. So there is a generational divide, and I think it derives from experience. How many of our grandparents knew openly gay individuals or had friends who were gay, and yet kids who are in college probably have roommates or good friends who are gay.

What's happening is that these young people are discarding the half dozen passages in the Old and New Testament that condemn homosexuality because their experience is at variance with Scripture.

Well, now science is presenting the same sort of challenges — not sociological but neurological challenges to Scripture. What happens if being gay is not a choice but it's a wiring issue? What if it's not an aberration, but kind of a fairly common tendency? After all, you see homosexual behavior in every society in the world — and not just in human society. You see it in primates. You see it in lions. You see it in deer, in Rocky Mountain sheep. I mean, you see it everywhere.

Enter neuroscience. The studies are very, very young, but one of the most intriguing studies that I saw was conducted a couple of years ago by scientists at the Karolinska Institute in Stockholm, which is the institute that is most closely associated with the Nobel Prizes. What researchers there did is they took brain scans of 90 volunteers — 25 heterosexuals and 20 homosexuals of each gender. Boiled down to the essence, they

found that the brains of straight women looked like the brains of gay men, and the brains of straight men looked like the brains of lesbians.

Here's what they did. In terms of brain structure, they looked at what a brain looks like, how it's shaped. Lesbians and straight men had asymmetric brains with the right hemisphere slightly larger than the left. Gay men and straight women meanwhile had symmetrical brains.

The scientists then looked at how the brains worked when processing information using PET scans. They watched the blood flow, and specifically, how the amygdala, which plays a key role in emotional reactions, was connected to other parts of the brain. And once again, when looking at blood flow, the patterns in gay men matched those of straight women. The signals from the amygdala ran straight into the regions of the brain that mediate mood and anxiety.

In lesbians and straight men meanwhile, the amygdala fed their signals into the areas of the brain that trigger fight or flight, responses to fear. In other words, the researchers wrote, faced with an emotional situation, gay men and straight women were more likely to internalize and become depressed. By contrast, for straight men and lesbians, the parts of the brain that say, "Hey get up. Do something. Fight or flee!" — those parts lit up.

Obviously, this is preliminary research. There's a lot more to be done, but I do think that this is raising the question: What if you're gay from birth? What if your brain is different? Are you destined for hell? Should people be condemned for their wiring or their genetic predisposition?

And what are evangelicals and black Protestants to do with these findings? Of course, some would argue that your genetics or brain structure is not your destiny. Just as a married person can resist adultery or an alcoholic can resist a drink, so people can resist acting on their sexual orientation — although of course a lot of people would say, "I'm this way, so why should I resist that?"

But what I do want to say is I think science is going to continue to chip away at this notion that homosexuality is a sin and that Scripture, which is God's word to many people, should

be read with a modern eye just as we no longer consider stoning our children when they disobey us.

The final thing I want to talk about is I actually think one of the most interesting and overarching challenges to religion, and that is the issue of free will. Do we actually make choices? Do we control our destiny?

And if we don't have free will, then we can't sin. Why? Because sin is deliberately choosing to disobey God. I mean, think about Adam and that apple, about going against the moral order. Sin is central to Christianity, to Judaism, to Islam. Take away sin, and you take away the religious narrative, and that's particularly true for Christians, I think. The entirety of the Bible is a journey to undo that initial sin in the Garden of Eden or, for more sophisticated believers, one's tendency towards selfishness and sin.

The whole story of the Bible is about making it up to God for our sin through animal sacrifices or other sacrifices in the Old Testament, and finally throwing up your hands and saying, "You know, we're just sinners in need of a Savior. We're too sin stained to redeem ourselves. So God sent His Son to sacrifice himself and wash us clean with his blood."

Sin is central to Judeo-Christianity, but what if we don't make choices at all? What if our genes and our brains and our personal experience steer us in certain directions such that we have no free will?

What if Francis Crick was right? Crick, as you know, co-discovered the structure of DNA, and he captured the sentiment of a lot of elite scientists when he wrote this. "You, your joys and your sorrows, your memories and your ambitions, your sense of personal identity and your free will are, in fact, no more than the behavior of a vast assembly of nerve cells and their associated molecules."

Okay. To me that just feels wrong. I don't know about you, but I think I make choices every day. I don't think I was predestined to marry Devin Hagerty. I don't think that I was predestined to select chicken salad for my box lunch rather than turkey on rye. How can my brain and my experience possibly make choices for me?

And yet many scientists, many, many scientists have concluded that free will is an illusion. They conclude this from a test, designed by a neuroscientist named Benjamin Libet. Libet took a group of volunteers and wired them up with electrodes on their scalps and their wrists. The scalp electrodes recorded the brain signal that precedes any voluntary action. It's called a readiness potential. And the wrist electrodes showed when the muscles were actually moving. So you get intent and movement. And then he asked these subjects to stare at a clock. Stare at a clock and flick their wrists whenever they felt like it. And they were supposed to report when it was that they were first aware of the intention to move their hand.

What Libet and others found was that the brain was getting ready to move the hand *before* the person was conscious that he wanted to move their hand. What they concluded action preceded the conscious intention to act by a third of a second.

Now, look. I've looked for other studies that decimate free will. This is it. To me, it seems like a pretty thin reed to hang all of free will on, but this is it. And a lot of people accept this. I have a friend who was a serious believer at *New Scientist* magazine, and he did this test, and now he no longer believes in free will. So, this is the test that many scientists, neuroscientists believe proves that we only *think* we make choices, but that, in fact, those choices are predetermined.

Now, you can dismiss this as extreme reductionism. And I think we need a little bit more evidence that we conclude don't have free will. Before you do dismiss it, let me tell you how this is actually seeping into real life and into the courtroom.

I'll just end with these two stories. This summer I did a series on the criminal brain — and forgive me if anyone has heard this series. It was a series really about the emerging argument that "my brain made me do it."

In one of the pieces, I looked at the brain mechanisms of psychopathy, and I flew out to New Mexico where a neuroscientist named Kent Kiel is doing some really fascinating research on psychopaths. He's kind of a wunderkind, and the way the University of New Mexico lured him out there was to give him a mobile brain scanner, which he drives from maximum security prison to maximum security prison, and he scans inmates' brains.

The inmates love it because they're so happy to have a break in the boredom, and so he's now scanned about 1,100 brains of maximum security prisoners. Interestingly, only about 20 percent of violent criminals meet the criteria for being a psychopath. So he's scanned normal brains. He's scanned the brains of violent criminals who are not psychopaths, and then he's scanned psychopaths' brains.

And he's concluded that psychopaths process information differently from other people. In one kind of study that he showed me, he slides the prisoner into a brain scan and then flashes a few hundred photographs in front of him. He can see the photographs while he's lying in there. There are three types of pictures. For example, take the subject of *fire*. One photography is neutral — a few kids standing around a Bunsen burner. Another is violent, but morally ambiguous. It could be a car on fire, but you don't know why. And a third is morally objectionable — three KKK members lighting a cross on fire.

Kiel then watches to see what the brains do as the subjects process his photos, and he found a key neurological difference between you and me and the maximum security prisoners who aren't psychopaths, on the one hand, and then the psychopaths, on the other. When a normal person sees a morally objectionable photo, part of the limbic system lights up. It's what Kiel calls the "emotional circuit" involving the orbital cortex above the eyes and the amygdala deep in the brain.

But when psychopaths see the KKK picture, their emotional circuit does not engage in the same way. The early evidence is that they process this morally objectionable picture in the language area of the brain. So they know that burning a cross or doing something like that is wrong, but they don't *feel* it's wrong. It's not going through the emotional circuit. It's going through the language circuit. They don't feel it's wrong even though they know it is.

Kiel says the emotional circuit may be what stops a normal person from breaking into that house or killing that little girl. But psychopaths the brakes don't work for them, and he and others believe that psychopaths are a little like people with very low IQs who aren't fully responsible for their actions.

The courts treat people with really low IQs differently. For example, they can't get the death penalty, and so now Kiel and others involved in this emerging science called "neurolaw" believe that psychopaths shouldn't be given the death penalty either — because they couldn't help it, that they were born with brains this way. They're not fully culpable, which doesn't mean they shouldn't be in prison, but just that they shouldn't get the maximum punishment.

And what's interesting is that Kiel made this argument in a murder trial. I mean, this stuff is actually coming to the courtroom. He testified in the murder trial of Brian Dugan. Dugan is a serial killer who had been convicted already for killing two girls and had a life sentence for those murders, but now he had confessed to killing a third girl, and he faced the death penalty. And what Kiel was saying is that you should not give this man the death penalty. It was a "my brain made me do it" defense. He wasn't fully culpable.

The jury didn't buy the "my brain made me do it" defense, but it's significant that the evidence was allowed in court, and legal philosophers at places like Princeton and Harvard argue that neurology is going to up-end our legal system. Our legal system in based on the notion that a person is guilty if he knew what he did was wrong at the time of the crime. Legal philosophers say this neurological evidence is going to revolutionize not only our legal system, but our whole notion of crime and punishment, morality and culpability.

And in fact, another story shows how this defense is actually beginning to get traction. A few years ago, there was a guy named Bradley Waldrop who basically went ballistic one night. After telling his kids, "You'd better tell your mother goodbye," Waldrop proceeded to shoot his wife's friend to death and then go after his wife with a machete and cut off a few of her fingers.

And during the trial there was a forensic scientist from Vanderbilt who testified that Waldrop had a variation of something called the MAOA gene. This variation of the gene has been dubbed "the warrior gene" because it has been associated with violent and explosive behavior. The Vanderbilt scientist told the jury that while the warrior gene didn't make Waldrop kill one person and try to kill another, it created a *risk factor.* In the

end the jury refused to give Waldrop the death penalty, which prosecutors had been seeking, and instead found him guilty of voluntary manslaughter.

I went down to Tennessee and I talked to some of the jurors, and they told me that the evidence about the warrior gene had had a major impact, and that Waldrop wasn't fully responsible for his actions. I remember sitting in the living room of one of the jurors, who looked at me and said, "You know, a bad gene is a bad gene."

(Laughter)

So it's clear that we're all predisposed to certain types of behaviors and proclivities. You know, some people have OCD. It's a brain wiring problem and it ruins lives, but no one would say it's sinful. But what if you're predisposed to fly off the handle, to be violent, to become addicted to drugs or alcohol, to manipulate and lie and cheat? Are these behaviors immoral in religious language? Are they sinful if a person's brains and genes push them to do it?

And I would suspect that most of us would say there's a difference — people who behave badly or immorally have a choice about whether to cheat or kill, for example. The sin is a conscious decision to make the wrong choice. But I actually think that science is turning black and white into gray here. After all, a few years ago everyone believed that alcoholism was nothing more than weak and sinful behavior, right? Now, we know that an addict's brain simply functions differently, and that alcoholism runs in families. So there is a genetic component as well. It has changed the way we think about alcoholism.

So what does that mean for religion? Well, is this is the end of morality, of sin? I don't think so. I think that more people believe in free will and our ability to choose well than don't believe in that stuff, and personally I think scientists have to come up with a slightly better and more compelling evidence that free will has gone by the wayside rather than hooking you up to some electrodes and seeing when you flick a wrist.

But I do think that religions should probably take note of these developments and come up with perhaps a more nuanced view of sin and morality than just taking a strict reading of scripture.

MR. CROMARTIE: Well, thank you, Barbara.

And in light of Barbara's comments, we've decided to extend the session until four o'clock this afternoon.

(Laughter)

MR. CROMARTIE: She's put so much on the table that we will not resolve it in the next hour and a half, but maybe we will. But before I call on each of you, and I have a list going right now, Elaine wanted to make some comments quickly on what Barbara had to say.

In fact, settle all of this for us before we begin the conversation.

DR. ECKLUND: That's right. That's right.

Well, I am neither a natural scientist nor a theologian. Where is our resident Catholic theologian? I would like a lifeline.

PARTICIPANT: He's over there.

DR. ECKLUND: Oh, okay. Right, the Vatican does need a better communication plan is the first statement.

So Barbara raises really good points and ones which some of the scientists who have thought most about these issues that I interviewed actually raised, too, and I talked about this in my book. One kind of point is we need to have more discussion, I think, in the academy about the nature of the human person, and that's a consequence of disciplines being in their silos, right? So there's a lot of lip service right now in the academy to interdisciplinary work, but very few models of how we do it.

In all seriousness, I wonder how a robust philosophy of science or theology of science would respond to the kind of comments Barbara has raised. So that's one kind of broad comment, particularly as related to the human person. Is there a uniqueness of the human person? Questions like are the mind and the brain different entities, and what does that exactly mean?

Second, we need to have more conversations about the limits of science. Is science limitless, and what are the consequences for our society if we treat science as limitless? Are there certain types of knowledge?

So obviously this is very compelling, although I don't really know. I haven't seen these studies, and I'm probably not the right person to accurately judge them, but as you presented them, they seem like compelling studies. But what kinds of frameworks do we use for interpreting what we do with that kind of information, what we do with those studies?

Is science so self-contained that it can tell us what to do and how we ought to answer those questions of "ought," right? How we ought to live, given the results. It certainly changes the game. So I think the question is not, you know, is there morality, but is morality what we thought it was, right? So there are those kinds of questions: can science tell us what to do with this information?

So absence of free will doesn't bring into question just Christian notions of sin, but it also brings into question the whole self-help movement, you know, whether or not — you know, is it my choice to meditate?

I mean, there's a huge — there's sort of what we call socio-syncretic religiosity happening among people under 30, by which I mean there's sort of an incredible empowerment among young people now to feel like they — I guess I no longer fit into "we" — I used to say "feel like we," but I don't know if I fit under. It depends — thank you. Thank you. Bless you.

So I have a funny story. I was a graduate student. I was 27 years old, and I was teaching a group of undergraduates at Cornell University, and a student comes up to me and says, "I just think you're such a great teacher, and I hope that when I'm as old as you I will be as wise." But that's my aside story about youth.

So you know, this brings into question sort of choices along a variety of dimensions, right? So evangelical Christians tend to make very assertive kinds of claims about these issues.

They're the first ones to get picked on and maybe for good reason because they're out there on the front lines.

But all kinds of religious and spiritual experience and traditions make claims about free will and its implications, and how we understand free will within constraints is another kind of issue we need to have more discussion about.

And fourth, if we care about science education and science ethics, I would still argue that scientists need to be in conversation with smart religious people. So just because, you know, it doesn't matter sort of what those traditions are, the reality from all the very best social science research is that the American public does take religion seriously, is a religious public, does use religion to answer these kinds of things.

So whether or not you are personally religious, as a good scholar you need to be in conversation with those traditions in order to translate your scholarship to a broader public.

And then we're at a point in our society and the very best scientists will say this; we're at a point in our society where the rapid — the pace of scientific discovery is so great that our religious traditions and the best theological thinking and the best philosophers of ethics who have even a secular ethics as well have not caught up in thinking to the rapid proliferation of scientific discovery in the end.

You know we have a situation where one discipline is proceeding very, very quickly or set of disciplines, and one, I mean, just by the nature of what these disciplines are, a philosophy or a theology, tend to be slower and more reflective, right, and to ask the questions of why, not just can it be done, right?

And so those are some of the issues I wanted to bring onto the table, largely through the lens of the scientists I spoke to. These are the questions that they bring up as well when I ask them questions about ethics in science and the relationship between the two.

So thanks. This is great.

MR. CROMARTIE: Thank you. Yes, okay. Lauren Green and then Jessica and Ross and Dan and Kirsten, but Lauren.

LAUREN GREEN, Fox News: Okay. You know, I've got a lot to say. I know I just want here — and I will get to a question eventually.

MR. CROMARTIE: Please.

MS. GREEN: And, Barb, I really respect all of the research you've done. I know you've got a great mind, and also Elaine, wonderful as well.

I do think from the very beginning that you sort of limit God. That's my overall umbrella statement. There's a limiting of God here and a misunderstanding of what sin is. We seem to be understand sin as behaving badly. All sin is is a refusal to put God in the sort of chair of authority. You know, I am my own authority. I have my own authority. It's not about behaving badly.

That being said, so that's kind of why I wanted to sort of define the idea of what sin is. We use that phrase out there as if it's something like, oh, it's people behaving badly. Sin is simply saying I am my own authority, not outside of my own authority.

And also the idea about — and, again, to the issue of homosexuality. These are things when you study the brain it's a very, very difficult situation because when you study the brain of adults, how much is the shape of the brain due to experience and how much is experience due to the shape of the brain.

PARTICIPANT: It's both.

MS. GREEN: We don't know that. We understand that every experience from the moment we come out of the womb to the — well, actually the moment the child is conceived and begins to interact with an environment either in utero or even after he's born. Every experience forms the synapses that forms the template for the brain.

So we are more a creation of what has been done to us and how things have interacted to us than any choices we make for ourselves. Free choice? Well, it's a very complex idea

because you think you have free choice, but by the time you're even old enough to realize you're making choices so many choices have been made for you, where you go to church, where you go to school.

MR. CROMARTIE: Lauren, you've got to turn it into a question.

MS. GREEN: Okay. I'm just — sorry. So basically let me get back to the idea of genetics. When you talk about the MAOA gene, the warrior gene, how do we know how genes interact then with the environment? Just because a gene is present, does it necessarily mean that you are destined to behave in a certain way, in a certain kind of unsociable kind of way?

MR. CROMARTIE: Before you answer that, can I just get a couple of issues on the table before we take a break to check out? So Jessica, you're next and then Ross.

Go ahead. You're up. Yes.

JESSICA RAVITZ, CNN: May I?

MR. CROMARTIE: Yes.

MS. RAVITZ: We talked a bit yesterday about American exceptionalism, and I was wondering. I don't know if you can speak to this at all because I know your research was focused on America, but I'm wondering if the experience of scientists in other countries are similar, if you have sense of that.

MR. CROMARTIE: Very good. Okay, and Ross, and then we'll get some answers going.

ROSS DOUTHAT, *The New York Times*: I mean, I guess this is a bit related to what Lauren was bringing up, but particularly for Barbara I wonder if you could just meditate a little bit on the possibility that the world —

MR. CROMARTIE: Meditate, yes.

MR. DOUTHAT: Dilate, talk. Talk a little bit about —

MS. HAGERTY: I think "meditate" is an appropriate word.

MR. DOUTHAT: Mediate, deepen. What's the Italian? "Approfondire"? I guess you could say the world view that you've just sketched out is that that kind of argument is one of the reasons for the kind of chasm between science and religion that Elaine was discussing in her presentation because it seemed to me listening to you describe what I think is pretty clearly a view of religion that's pretty potent among sort of scientific students of religion, that you know, throughout your discussion a sort of value laden scientism seemed to steal a lot of bases.

I mean, it seems like there's a lot of sort of "is/ought" conflation going on there where scientists say, "Well, we're only studying the natural world, but by the way, having studied the natural world, we figured out, you know, how people should behave."

I mean, so I guess, yeah, I'd just like you to talk a little bit about that possibility. I mean, just to give one example, the question of, the idea that sort of science has discovered, you know, the fact that free will might be a, you know, sort of problematic concept in human affairs, I mean, obviously going back to the debates between, you know, John Calvin and the Roman Catholic Church. I mean, it's not sort of news to religious thinkers that free will is a tangled and complicated issue.

MR. CROMARTIE: I think we just heard from our theologian.

The last time we had Ross here he was a respondent up here, last March, to James Hunter, and he's the first and only person to quote Tertullian at one of our conferences to make a point. You could have weaved it in even there, Ross.

MR. DOUTHAT: I was thinking of it, but I decided not.

MR. DIONNE: He was restrained by humility.

MR. CROMARTIE: Yes. Okay. So we have Lauren and Jessica and Ross on, and we'll maybe get some answers and then the others can come in after the break, but if you've gathered those up, which one of you would like to go first?

DR. ECKLUND: I'm happy to.

MR. CROMARTIE: Both of those were directed to both of you. Sure.

DR. ECKLUND: So Question 1, Lauren's question, which I think is how do we know that the effect of genes interacting with the environment. So the scientists that I have talked to would say we don't. So the religious scientist would say, you know, that's where a robust morality comes in, and there are other kinds of knowledges that are important to figure out these questions of "ought."

The nonreligious scientists that I've interviewed would say it's only a matter of time, right? So it's only a matter of time before science fully explains, you know, how genes interact with the environment and our models become, you know, sort of more complicated to completely explain these questions.

That's a minority of scientists I want to point out by way of actually responding to Ross' question first because I think these two questions are connected. That's actually a minority of scientists.

So we also need to ask not just how scientists view religion, but how scientists view science, right? So do they see science as a totalizing world view or do they see science as having limits, and there is a range among even the most elite scientists of how science is viewed as well and so, you know, putting science sort of in its proper place as they see it.

So I hope that answers your question at least a little bit.

To Jessica's question about science and the other nations, there has not been a good study at all actually, and that's one of the research areas that I'm verging into now, is trying to understand how scientists in different nations understand religion, the kind of religious challenges of the public in their particular nation, and also the issue of how science, which is a very global endeavor, comes to terms with a universal ethics to govern science and the limits of science.

I think those are really hot research questions, and people ought to study them. I can't certainly do it all, but I hope other scholars pick this up.

By way of a sort of caveat, the religious characteristic of, say, Europe, characteristics of the European nations are just massively different. I mean, the kind of migration stream that's happening in the U.K., for example, particularly the presence of Islam, is having a big impact on science, and I talked with a scientist in the U.K. who said, I think, in a very non-PC fashion, he said, "Well, you know, if you ask me what I think about science and religion, your evangelicals in the U.S. are our Muslims in the U.K. They're our problem here."

And this scientist shall remain nameless. So there are religious challenges. Scientists perceive there to be religious challenges in other nations, but the character of those religious challenges is going to be a good deal different, but I think that's a great question.

And just to answer Ross' question a little bit further, I wonder if researchers have too much thought of science as being completely static. In that it is sort of presupposed by the whole conflict narrative, which completely colors how we think about our research. We sort of have a uniform science, and we assume that everyone understands science the same way and its implications the same way.

Yet then we talk about religious diversity over on the other end of the equation, and I think that's wrong, a wrong way to proceed with research in this area.

MR. CROMARTIE: Okay. Barbara.

MS. HAGERTY: Okay. Wow, there's a lot of ground —

DR. ECKLUND: I know. Right?

MS. HAGERTY: First, the overarching comment I have is to quote a scientist who said to me, "You know, 96 percent of the universe is dark matter. We don't have a clue," and for us to say that we have definitive answers on any of this stuff is absolutely ridiculous, especially when it comes to ideas about morality and spirituality. I mean, when did we begin really trying to understand the brain? It's only been few decades ago since we could actually look into the brain.

So all of this is really, really new science, and what I was trying to do today is just say, "Hey, these are" —

DR. ECKLUND: Yeah, this is possible.

MS. HAGERTY: This is a coming storm. This is what's being put out there, and believers who often don't engage with scientists might want to be apprised of some of these …

DR. ECKLUND: That's right.

MS. HAGERTY: Some of these arguments.

Like your question about the MAOA gene, Lauren. I actually have a different definition of sin. I thought sin was an archery term, which meant that you missed the mark. So I've always thought of sin that way, as a kind of missing, doing the wrong — not so much failing putting God on the throne of your life.

But at any rate, when it comes to things like is the MAOA gene, your destiny and how does it how does it interact? You know, I interviewed one neuroscientist who studied psychopaths — not Kent Kiehl — and he actually got a brain scan and did genetic testing of himself and his entire family, and what he found was that he had —

MR. CROMARTIE: That he was a psychopath.

MS. HAGERTY: He found that the way his brain responded to emotional things was just like a psychopath; he had the brain function of a psychopath. He also had the warrior gene, as well as a number of other genes that seemed to predispose him toward violence.

But he wasn't violent. He's this nice guy, right? I wouldn't have gone to interview him otherwise.

(Laughter)

you know, he would have been on the other side of bars, right?

Why is that? Well, some of the early research seems to suggest that people who become violent, who have kind of that brain or genetic predisposition, many of them have suffered violence as young children and experienced a lot of abuse. So it's nature and nurture. It's experience as well as genes.

And of course I am sure there are a lot of people with psychopathic brains who aren't doing anything wrong. They're CEOs, basically. I mean seriously. They are. They're CEOs and they're trial lawyers, but not psychopaths. So all I'm saying is that there is a lot to be done, but these are some interesting things that I think we need to think about.

In terms of Ross, you are so correct that this scientism, and one reason I think it's getting a lot of play is that there are very, very loud neo-atheists right now who are talking about these things, and they're shouting so loud it's making it a big debate.

But essentially, when you look at it from a kind of reductionist point of view, in many ways these scientists choose where to place the goal posts, right? They choose what you're allowed to measure. So they would say, we can't measure God. We can't acknowledge a spiritual dimension or a higher reason for morality because we can't measure God because by definition God is outside of the tools of science to measure.

So they just discard God or a higher purpose and take them out of the equation, and so all they are measuring is physical stuff. And so you can see why this would lead to a materialistic view.

Right now there's a very robust emerging science of morality, the evolution of morality, and a lot of the scientists believe that morality doesn't require the Ten Commandments or anything from Sinai or any sense of the holy or a sense that we were created in the image and likeness of God and, therefore, that's why we want to be moral.

They say that morality is just evolved and we don't need God. I have trouble with that. I mean, I think that there's a hierarchy of morality that religion answers better than, say, science does. For example, I think a lot of people would say that it is nobler to jump into a rushing river to try to save someone from drowning than throwing them a rope or running or getting a fireman to fish him out. There's a hierarchy of morality that says self-

sacrifice is better. Selfish genes would not like self-sacrifice. There's no evolutionary reason for that. But that morality is a little bit higher. Where does that higher morality come from?

Theologians would say that comes from God. I guess I'm agreeing with you completely, Ross, and I'm agreeing the free will has been debated for a long time, and we're not nearly, nearly at the end of this debate, and so I just leave it there because I don't have any more answers.

PETER BOYER, *The New Yorker*: Barbara, I wanted to say thank you.

In this lovely and very interesting book, I haven't gone all the way through it, but I did get to the part where you mentioned Francis Collins a couple of times. I just wonder if you might share with us what you found other scientists think about him because he's such an outspoken, born again evangelical, I guess you would say, Christian.

MR. CROMARTIE: And you've also — ladies and gentlemen, Peter has written a piece in *The New Yorker* about three months ago on Francis Collins. He already knows the answer to the question he just asked, but he wanted to put it out there anyway, you know.

DR. ECKLUND: Yes. So I'll tell you. Bear with me. I'm going to say some kind of big methodological thing for those who care about these kinds of things.

So I did these 275 interviews with a random sample of those who responded to the survey. So I'm very confident in the interview responses as well.

And what I did is I and students coded the resulting 5,000 pages of transcribed materials systematically for people scientists mentioned, right? So people scientists mention often.

Francis Collins was mentioned the most often. Richard Dawkins was also a close second, and Richard Dawkins was pretty uniformly described in negative terms for his impact on issues of public science. You know, the common phrase was, "I'm also an atheist, but no friend of Richard Dawkins."

And I make no judgment on that.

MR. CROMARTIE: Why? Why?

DR. ECKLUND: Because of his perceived impact on public science and particularly perpetuating the view that scientists are uniformly against religion, which you know, even for those who would see themselves as being against religion, they know. I mean, scientists are savvy, intelligent people, and they know that they're dependent on the public for funding. They're very concerned about science education, and so they don't want to do anything that's going to give the sort of public impression that they're uniformly against religion. And I talk about that in the book.

And then Francis Collins was mentioned very positively, and this was somewhat ironic to me because we also coded the interviews for how they talked about religion in general, and American evangelicals — I started this study in 2005, which as you know from your own excellent journalistic work, and Laurie — I actually quote Laurie Goodstein's work quite extensively, you know. It's the coverage of the trial about intelligent design.

And so that was the Dover trial, and this was going on, you know, while I was starting this data collection. And so all the scientists initially wanted to talk about in the first year of the study was intelligent design and sort of the negative feelings that they had towards evangelicals.

So on the one hand, they're describing evangelicals in very negative terms, but then describe Francis Collins in very positive terms, which was interesting, and actually called him a boundary pioneer, you know, someone who's able to cross the boundaries between science and religion, while maintaining the integrity of both his scientific commitments and in their perception his faith commitments as well.

So they saw him in pretty uniformly very positive terms, and they were actually looking for someone, you know, who could help them navigate that for the sake of public science.

Now, I want to be clear. They weren't like looking to Collins to figure out more about religion, but they were like here's someone who could help us have a sort of intelligent voice among religious people.

MR. CROMARTIE: Barb, you know him also. You might want to comment, or no?

MS. HAGERTY: No, he's a lovely man, and he's basically the smartest person I've ever met, excluding everyone in this room, of course.

(Laughter)

MR. DIONNE: Very shrewd, not true, but shrewd.

MS. HAGERTY: But, I mean, I think Christopher Hitchens, the story with Christopher Hitchens is really kind of the evolution of their relationship where initially Christopher Hitchens didn't really think very much of Francis Collins, and after he was diagnosed with cancer, of course, Francis Collins offered to work with him on the latest treatments, and now Christopher Hitchens calls Francis Collins one of the generation's great Americans.

So it's interesting how one has principles. I know Christopher Hitchens has often said that he would not — he's told me in interviews that he has no respect for religious people and he wouldn't pretend that he would because it would be, you know, abandoning his principles, and yet I guess when experience comes into play, Francis Collins has been able to go and help him, and it has changed his view of at least one religious person.

MR. CROMARTIE: Dan Harris, you're next.

DAN HARRIS, ABC News: A question for each of you. Elaine, I will, with the caveat that I am the child of and husband of a research scientist all of whom are nihilistic atheists. I approach your work with a bit of skepticism, and I wonder. There are a couple of things I would love to have you address. I don't remember your top line number about people's feelings about religion, but I think you included Unitarian Church attendance in there, and I wonder if that doesn't skew the numbers somewhat.

DR. ECKLUND: But a very small proportion are Unitarians. So I can't remember right now, but actually putting together, you know, outside of Jews, Catholics, and Protestants only, you know, less than I think like three percent or like all the other religious categories together. So there's a pretty small proportion of Unitarians.

MR. HARRIS: And on this professed admiration for or professed aversion to Dawkins, you know, I think the atheist pushback on what you were saying would be it's fear based.

DR. ECKLUND: Un-huh.

MR. HARRIS: Scientists worry. I mean, I've heard Sam Harris say this, that scientists worry. Sam is obviously a scientist himself. Scientists are very sensitive to public perception because that's where they get their money, as you acknowledge.

DR. ECKLUND: Yeah, funding and education. I mean, this is so dominant.

MR. HARRIS: So on the merits they may agree with everything Dawkins says. It's just they don't like that he's saying it and the way in which he's saying it. So I actually think that's a key point that may or may not be fleshed out in your research.

DR. ECKLUND: It is, I think, assessed pretty strongly in the book if you read it thoroughly. So 34 percent of this population, and these are academic scientists, so then we need to ask questions about, you know, would scientists be different in other kinds of corners, are committed atheists, and I think, you know, I totally stand by that, but then there is complexity among the atheists.

So I think it's a different kind of atheist to be totally sold out to a modernist way of thinking, right? And then another kind of atheist to say, "I see myself as a spiritual person, you know, having, you know, developed a sort of spiritual world view." I think those are different in kind.

And so one in five atheists see themselves as spiritual and have a codified way of thinking about that, but a big proportion of this population, I wouldn't want to, you know, come away having anyone believe that I'm trying to obscure that. A big proportion of this population are atheist. Another big proportion is agnostic, so not knowing whether or not they believe in God.

I didn't get a chance to say this in my talk, but Dan's question maybe is a good opening. Agnostics are also considerably more complex than we might think, with a good proportion of them being part of religious communities.

So my suspicion is that agnosticism means something different in the scientific community than it does in the general population, you know, because scientists aren't really sure. You know, you're going to press a scientist to the wall, and they're not going to say, "I'm 100 percent certain" about anything. So saying, you know, I'm an absolute theist sort of means something different, and so there is a variety.

I mean, there's agnostics that are almost like atheists, right, you know, just say, well, the most defensible intellectual position is I'm not sure whether or not there's a God. That's the most intellectually defensible position.

And then there are ones where I'm not totally sure there's a God, but I'm mostly sure, right? Those are different, and that's the beauty of having a mixed method data collection where you both ask people to check off boxes where you constrain them, and you follow up by, you know, collecting rich interview data.

That's a good question.

MR. HARRIS: When you say things like selling out to a modernist version, does that expose some of your bias?

DR. ECKLUND: I don't think so. I don't think I said "selling out."

MR. HARRIS: Yeah, you did.

DR. ECKLUND: Other scientists see them as saying that. I don't really have any — you know, I really wanted to figure out what they believed, and I think that this study, I mean, if you just want to ask me how this study changed me, I was actually surprised at the presence of religion.

But I want to be really clear. It's a different kind of religion, I think, than in the general public. So if you, you know, look at how others have utilized these results, I think you're right in bringing up issues of bias that others have used these results to sort of say, "Oh, my gosh, scientists are so religious," and I think it's a very different kind of religiosity than the general public, and in a research perspective that needs to be strongly underscored.

MR. HARRIS: Can I ask Barbara a question?

MR. CROMARTIE: Yeah, I was going to say you've been asking the shortest questions of anybody the whole time, and your follow-ups are fine.

MS. HAGERTY: Yeah.

MR. HARRIS: Okay.

MR. CROMARTIE: Go ahead, Dan.

MR. HARRIS: So I was really interested when you were talking about free will, and to bring up Sam Harris again, he actually once said to me — as I think everybody here knows, he's a neuroscientist — Sam says we don't know where thought comes from and had said to me once in a private conversation, but I assume he won't mind if I repeat it, that he doesn't feel comfortable taking credit for anything he's done because he doesn't know where thought comes from.

MS. HAGERTY: That's interesting.

MR. HARRIS: And I wonder what your thoughts are about that and what that says about free will, and what's also the topic of his next book.

MS. HAGERTY: Right.

MR. HARRIS: And the reason why I think he's a much more interesting character than people give him credit for is he's a practicing Buddhist, a secular version of it, and obviously a main tenet of Buddhism is the illusion of the self, which happens to be the title of Sam's next book.

And I wonder if that plays into all of this, too.

MS. HAGERTY: Wow, okay.

DR. ECKLUND: That's interesting.

PARTICIPANT: He doesn't want to take credit for his royalties.

DR. ECKLUND: Exactly, exactly.

MS. HAGERTY: This has moral implications, doesn't it?

Well, I do think —

PARTICIPANT: That's an illusion of the cash.

(Laughter)

MS. HAGERTY: Well, I don't know what Richard Dawkins would say, but I think Sam Harris is a little different type of atheist in this sense. I mean, he's Buddhist — and you know about this much better than I — but they don't think of a God as a personal God. And yet Buddhists are so conscious of their thoughts and of their brain. I've found Buddhist scientists among the most open on the big spiritual questions, just like Christian scientists, as opposed to Christian Scientists which I used to be, but Christian scientists or Jewish scientists that seem to be engaging the big issues.

I think that line highlights the most important debate in neuroscience today, which is the mind-brain question. A lot of neuroscientists think that our minds, our thoughts, are nothing more than brain activity. It's all brain function, and all our thoughts are nothing more than the firing of cells.

And yet there are a large number of very prominent scientists who believe that that question hasn't been answered yet. Does consciousness or mind emerge from the brain? Is it a separate property? Does it have separate properties?

And no one knows the answer. It's a pretty new area of study right now. For me, it's the most intriguing area. In my own research, when I looked at circumstantial evidence for something more than this (tapping on table), for something beyond the human or material, this material table and us, when I look for divine or spiritual realities, I found two things to be really interesting pieces of circumstantial evidence.

One involves consciousness — the mind brain question. Is it possible that our consciousness can operate when the brain is not functioning well, or not functioning at all? I did some research on this. And if it's true that your consciousness can operate when your brain is off-line, does that suggest that maybe we're not just a bunch of molecules? Which is a mind-bending question.

The other piece of circumstantial evidence that there's more than this material world is the transformation that people have when they seem to encounter something that they believe is supernatural or divine. And actually one of the most prominent scientists I interviewed for my book, a neuroscientist at Johns Hopkins, was a materialist until he began practicing Buddhism and meditating. And his experiences during meditation made him think differently about consciousness. So I'm not sure if that gets into anything except to say I don't really know the answer to your question, but I think these are questions that are really, really important right now, and science is tackling them.

DR. ECKLUND: And this — I just wanted to add. Dan raises some other excellent issues about how we define religion, which I think are really important and so what is a secular Buddhism and does that count as religion or is that completely outside of religion?

Probably you would say it's completely outside of religion, but that's something that's not answered well, I think, in the scholarly community right now and, you know, sort of maybe some of you will interrogate that. I don't know.

Also —

MR. CROMARTIE: I'm really into Pilates. Does that mean that —

DR. ECKLUND: Well, I mean, sort of religion is being redefined, right?

MR. HARRIS: Well, if we could play out your clip there, there was a recent kerfuffle over Albert Mohler coming out and saying that Christians (speaking off microphone).

MS. HAGERTY: Yeah, un-huh.

MR. CROMARTIE: Yeah, I need to talk to Al about that.

MR. HARRIS: This line is fuzzy and controversial in a sense.

DR. ECKLUND: It is. It is, and the second quick thing I wanted to add is that, you know, is it a negative to be a religious person in the scientific community, and then is it a negative to be an atheist in the general population?

So, you know, recent survey research has shown that atheists are perceived very negatively, often by the American public with the American public not wanting an atheist to be President, you know, all these kinds of surveys that we do. So is there something going on here that we should investigate more?

MR. HARRIS: (Speaking off microphone.) Part of some of my instinctive eyebrow raising when I hear about your book because is that the right question to ask the, you know, afflicted minority of religious scientists, or is it the right to ask question to ask is the afflicted minority of non-religious Americans? That to me, you know, it seems to me that the microscope is in the wrong place just personally.

DR. ECKLUND: I can — do you want me to respond?

MR. CROMARTIE: Go ahead.

DR. ECKLUND: This is great. I would agree with you, like I actually think that more research — I'm a huge advocate on studying irreligiosity in America and thinking about the possible sources of discrimination there, and I actually am suspicious of charges of discrimination in the — I think charging discrimination is a really serious deal, and we need to think about what we mean by that.

But I report what scientists say, you know, in the book, and there is a small proportion of them that perceive themselves as being discriminated against.

MR. CROMARTIE: Okay. Kirsten, you're up next, and then E.J. and Carl Cannon.

KIRSTEN POWERS, *The Daily Beast*: Okay. First of all, this is really great, and I haven't had a chance to read your book, but I'm looking forward to it, and I have read Barb's book. If

anyone has not read it here, you have to read it because it's just — it's fantastic. It's really fascinating.

And I was interested, Barb, when you were talking about people sort of, their brains, and you know, you're sort of born this way and this is the way your brain is and what does it mean, what you think about the plasticity of the brain and how it changes, and you know, is it possible maybe they're born with a, quote, unquote, normal brain and then something happens that changes it which then would suggest that it, of course, could change back. So that's one thing I'm interested in.

The other thing, as someone who is a believer and who has seen miraculous things happen through prayer, you know, I think things that are actually supported through studies that have been done, you know, meditation can actually change your brain, things like that.

I'm always interested. I am a child of scientists. I'm always interested in the science, but I do know it's hard sometimes to square with things that I have seen and, you know, the belief, I think, of a lot of Christians at least which is that, sure, okay, maybe somebody is a psychopath, but someone could have cancer and God can cure that, and somebody God could cure that they're a psycho.

I mean, you can pray about things and change them, and I'm just wondering how that fits into — and I think that's why a lot of Christians have such tension with science, because you're telling them it just is this way and there's nothing that can be done, which goes completely contrary to their day-to-day experiences.

MS. HAGERTY: Whew, boy, yeah.

MS. POWERS: Sorry, yeah.

MS. HAGERTY: Those are big questions. Neuroplasticity, it's really hot. It's really important. It's really true.

MR. CROMARTIE: And what is it?

MS. HAGERTY: The brain changes. The brain changes with thought and the brain changes with experience.

MR. CROMARTIE: Define neuroplasticity.

MS. HAGERTY: Neuroplasticity is the notion that the brain is plastic, right? That it can be molded.

DR. ECKLUND: It can be changeable.

MS. HAGERTY: Right. And one reason religious practices have worked through the years, chanting, praying, meditating, is because it's like going to the gym. Richard Davidson at the University of Wisconsin gave me this analogy. It's like going to the gym every day and sculpting your brain the way you'd sculpt your muscles.

So you can change your brain, and in fact, Richard Davidson has found in a study that he did that if people who have never meditated before meditate for 45 minutes a day over two months, he found their brain functions changed as measured by MRIs and EEGs.

Not only that — their immune system was boosted. So what is clear is that any kind of practice and any kind of trauma, especially ones that last more than 30 minutes, for example, will absolutely change your brain.

That's the basis of cognitive therapy in many ways. Jeffrey Schwartz at UCLA did some really interesting studies. It has been going on for quite a while. Jeff Schwartz is a neuroscientist who specializes in OCD. What Jeff does with his patients who have severe OCD and somehow medicine doesn't help, he takes a brain scan of them, an FMRI, and he shows them that — I can't recall the exact places in the brain. So forgive my generality here — but what he has found, that people with OCD seem to have what he calls a "worry circuit." Most of us don't routinely trigger this "worry circuit." When you and I wash our hands, we just go on to the next thing. Our brains don't then think, "Oh, my gosh, did I wash them? Were they clean enough? I think I feel some germs on my hands," in which case there's this fear and anxiety that creeps up, which then makes you go take the action to wash your hands again.

But for people with OCD, it's like a bad loop, with one part of the brain triggering another. So what Jeff Schwartz has done is put his patient into a brain scanner and takes the FMRI. And he shows the patient the brain scan and says, "Okay. What this is is a faulty circuit. This is faulty wiring. The reality is you do not need to wash your hands. This is a faulty circuit in your brain, and every time you feel that you need to wash your hands, I want you to think, 'This is a faulty circuit.' This has nothing to do with reality and with cleanliness so to speak, that kind of a reality."

And within a couple of months, and sometimes sooner, the brain circuit is changed. It's broken.

DR. ECKLUND: That's fascinating.

MS. HAGERTY: And these people get over OCD. It's huge. He's sold something like 100,000 copies of his book on this, and so clearly what he is showing is that *thought,* in fact, *changes the brain*, changes brain patterns. Now, if that isn't neuroplasticity, I don't know what is.

And there are others. The book, *Change your Thoughts, Change your Brain*talks about this a lot.

So clearly, people can rewire their brains. The issue of prayer is really problematic in terms of science because the studies are so mixed, and the headline on the most recent and most rigorous prayer studies seem to show that my prayers do *not* affect your body. However, what has become pretty standard science, it's now called pscyhoneuroimmunology, is that my thoughts affect my body. Okay?

MR. CROMARTIE: My prayers.

MS. HAGERTY: My prayers, my thoughts, yeah. It's brain function. There is a lot of science on that, and you know, Harvard has a psychoneuroimmunology department and so does UCLA and other places.

So clearly there is something to this idea that your thoughts affect your body. Some people would call it prayer. Some would call it positive thinking, but that does affect your

body. What's less clear from the scientific studies done so far is that my thoughts, my prayers can affect *you*.

MR. CROMARTIE: Okay. E.J. Dionne.

E.J. DIONNE, *The Washington Post*: Since I have already said nice things about Bush, I will paraphrase or quote Rush Limbaugh about Kirsten's comments on Barbara and say ditto.

(Laughter)

I was very happy when I saw you were on this program for a particular reason, which is my son is involved in something called Public Forum Debate, and the debate topic that he just debated in New York this last weekend was something like public forums should not engage in controversial religious questions.

DR. ECKLUND: How interesting.

MR. DIONNE: The reason this came up is because they originally had a debate topic on the Muslim Cultural Center or, mosque, near Ground Zero, and there was a storm of protests. So they dropped the topic and then put this topic in. When my son and his partner were trying to come up with arguments in favor of the proposition that Public Forum this form of high school debating, should debate controversial religious topics, one of the arguments they made is that both scientists and religious people operate on a certain level of faith in method, you know, in an approach to the world.

They ran into some resistance from some judges on this argument. I can't remember if they dropped it and found another one, as you do in these debates as they go on, but he and I ended up talking about this at some length, and I was struck by a sentence in your book. "The insurmountable hostility between science and religion is a caricature, a thought cliché perhaps useful as a satire on group think, but hardly representative of a reality. Scientists face a plethora of religious challenges, both public and personal and employ just as many diverse responses to these challenges."

MR. CROMARTIE: What page, E.J.?

MR. DIONNE: That's right at the beginning, pages 5 and 6.

I'd love to know what would you say to my son's argument in terms of what you know about what scientists think. What was right about it? What was wrong about it? I'd just love you to interpret because you've probably explored the mind of scientists on these questions as much or more than anyone.

Thank you.

DR. ECKLUND: I haven't explored the mind of scientists the way Barbara is talking about exploring the mind. So that's a different kind of question.

But so you want to know if I think scientists are operating on a set of faith assumptions.

MR. DIONNE: Yes, and would they think that they are operating on a set of faith assumptions.

DR. ECKLUND: Um. So now you're asking questions about scientists' view of the scientific enterprise.

MR. DIONNE: In a way, yes.

DR. ECKLUND: So yeah. So I think that scientists have a range of ways of viewing science, and this is somewhat correlated with their religiosity. So the scientists who are avid atheists of the type that believe that science is a totalizing world view that can explain all of reality are tending to believe just that, that they don't have any kind of faith assumptions, that they only believe what is completely testable. So they are completely — you know, see themselves as complete modernists and are very, very comfortable with that.

But science as sort of totalizing, you know, sold out to modernity I think is getting a bit smaller. There's actually — there's sort of a more reflective science going on. That would be my assessment, you know, after doing this study for five years, that sort of that's becoming smaller in the academy and that there's a group of scientists who are now becoming more vocal within their community, especially with people who are very, very

concerned about teaching, who are very concerned about issues of public science, saying Gosh, we need to sort of think about what kinds of answers science can provide, what kinds of issues science is not equipped to deal with.

Stephen J. Gould's ideas about non-overlapping magisterium, that there's sort of a religious realm and a scientific realm, have become fairly popular.

MR. CROMARTIE: Explain that view again.

DR. ECKLUND: So that there's a sort of religious realm and a scientific realm, and that the two don't overlap.

Now, that can really be interrogated. I don't know. I'm just sort of talking extemporaneously. Am I going the direction that you're interested in?

So I think that can really, really be interrogated. So you have to ask then what do you believe about science and what do you believe about religion. So do you believe that they are non-overlapping because you are a religious person who believes that science is very, very dangerous, so science, you know, has fangs so it should stay out of religion, right? So, you know, what does your circle look like?

Or are you a scientist who thinks that, you know, science is big — and I actually draw these images on the board when I teach this stuff to my students — that science is gigantic and friendly and most of the world and religion is a little teeny, teeny part and it has fangs and, you know, needs to be kept out of science because it's so dangerous?

So, you know, Gould has put these ideas out in sort of a neat way, but you know, what do we really believe about religion and what do we really believe about science?

MR. DIONNE: Barbara, do you have any answers to my son's (speaking off microphone).

MS. HAGERTY: Well, he should just be prepared if he wants to debate science and religion that he's going to become a target. I mean, it's not a very pleasant debate right now, but you know, on this issue of non-overlapping magesteria, I actually think there's something

to it in a way because I think science and religion answer different questions, and you know the science is more the how and the religion is more the why.

And so I think it is possible to tease those apart, and I think one of the frustrations of both scientists and believers is that the ground rules are such that you can't study God or the transcendent. We can study the effects of religion, but we can't study the supernatural. We don't know how to do it.

And so it's almost an argument for me that's circular that doesn't have an answer. Scientists will say we can't study God and, therefore, we can't find evidence of God. And religious people would say everything that happens is from the mind of God, and so they step outside of science to find God.

I'm not answering this at all well, but I think it's an acrimonious debate and partly because they're not arguing about the same things.

MR. DIONNE: I just want you to know that they've got to debate this one more time, and your line "science is more the how, religion is more the why" is a wonderful line that could actually fit on either side of the question they're debating.

DR. ECKLUND: That's right.

MR. DIONNE: So that is very useful. Thank you.

DR. ECKLUND: And we're talking about these issues in philosophic terms and sort of abstract terms, right? And then we have to come down a level and talk about scientists as people and science as an institution, which necessarily means to deal with religious people and, right, you can't sort of keep it. You have this sort of magical idea of non-overlapping magisteria, but that doesn't deal with, you know, how do scientists deal with religious students in their classrooms who bring up these issues right in front of them.

Do they say, "well, you know, I believe in the non-overlapping, so don't talk about that." Or maybe that's a fine response. Maybe that's a kind of strategy. I mean, so we have to think about how this really applies in real world terms when we deal with one another as persons, which I think is actually what this debate is getting at.

MS. HAGERTY: In my experience interviewing a lot of scientists and a lot of believers is that some of these questions are like a Rorschach test — that whatever you believe in advance is the conclusion you'll have.

And so if you believe that there's a possibility that there is a spiritual world or divine mind or something like that, you can look at some of this evidence and say, see, that shows there's a spiritual dimension to life. The example that Andrew Newburg gave me is this: When you are eating a piece of apple pie, certain predictable brainwave activity occurs. As you lift the pie to your mouth and smell it, the part of the brain that mediates smell will be activated. Probably the part of the brain that mediates memory will be activated as you thought about the last time you had a piece of pie that was this good. The same with taste.

Does that mean that because there is predictable brain activity, then there is no apple pie? So scientists could look at brain activity and say, "God" is nothing more than brain activity. That transcendent feeling you had — that was just nothing more than brain chemicals, right? That meditation, that insight you had, brain chemicals. Don't worry about it. It's all within your head.

Whereas believers might say, no, brain activity is what happens when I encounter God, just like the brain activity is what happens when I encounter that piece of apple pie.

So I guess what I'm saying is that you can look at the same evidence, and depending on what your world view is, you come to completely different conclusions.

MR. DIONNE: Let me just say about that and then I'll shut up, is that when they were arguing the other side of this question, what they argued is judges could not come to any of these questions with the kind of fairness you need and, therefore, they should be ruled out. That's sort of putting aside the argument.

MS. HAGERTY: Right.

MR. DIONNE: You have to argue both sides of these things.

MS. HAGERTY: Right.

MR. DIONNE: That is in some ways a persuasive argument.

MR. CROMARTIE: Thank you, E.J.

Carl Cannon, you're up.

CARL CANNON, PoliticsDaily.com: I actually have separate questions for Barb and Elaine if that's all right.

MR. CROMARTIE: Yes.

MR. CANNON: It started with Lauren's question, and Kirsten asked about it, about this predisposition to being a psychopath based on brain waves. That strikes me as, well, not junk science, but a junk application of science. Those people are on death row. Is that where they are or maximum security prisons? I mean, wouldn't you have to know what their brain waves look like as children?

And here's why I'm interested. I covered courts for many years — I covered probably 50 murder cases, and in California when I was a young reporter, you had to bring in evidence during the penalty phase of mitigating circumstance, and every one of these guys was beaten, horribly abused as children, and it struck me that that would be a much more likely cause for their behavior and, in fact, maybe a cause for their peculiar brain patterns.

MS. HAGERTY: Yeah.

MR. CANNON: I mean, this is not new. You know, the Dan White case, Dan White killed George Moscone and Harvey Milk in cold blood, and he got manslaughter II on an equally dubious scientific theory called — we called it the "Twinkie defense." He said blood sugar had risen, and he had diminished capacity.

I mean, defense lawyers are always manipulating jurors, and usually the legislators come in and fix that. So I don't think there's a big change in the law, but I'm interested in the science.

And then my question for Elaine is much different. Could you just?

MS. HAGERTY: I think you're right, and I think one reason we haven't seen that much neurology come into the courtroom is partly because judges are afraid — a lot of people are afraid of how jurors interpret it. Are they sophisticated enough to say sure, this is brain activity, but there are a lot of people out there with perhaps the same brain function who don't who are not violent?

And they're worried that when you see these pretty pictures of the brain with red and green and blue, that jurors will be misled that committing the crime was an inevitability. So some people do think that these defenses are the Twinkie defense. It's just a neurological, you know. Instead of sugar levels, we're talking about brain activity.

MR. CANNON: Well, what about those brain scans? Wouldn't you have to know what they looked like when they were young?

MS. HAGERTY: And I've asked scientists about this. I've asked, couldn't the brain you do now while he's on death row be different from the one when he was young, or when he committed the crime? Having been on death row for five years, wouldn't it be a different brain scan from even when he killed that little girl? I mean, if it's a different brain scan, then how can you use it in his defense?

MR. CANNON: Right.

MS. HAGERTY: Right. And what they say, what at least some of them say is, well brains really don't change that much. Well, I don't believe that. Neuroplasticity suggests that brains do change and being on death row will change it.

One other thing there I'll say is that psychopathy is not determined by brain scans. It's really determined by a history of your behavior and a lot of psychological testing. What psychiatrists have come to believe who have studied this is that you can tell if someone has psychopathic tendencies by age four or five. So what do you do with those kids? Do you leave them to their fate? What if these are kids who have been raised in abusive homes, have abuse in their backgrounds? Do you say, "Oh, they're even higher risk. We put them away"? What do you do? So I guess what I'm saying is that all of this is really new science, which has, I think, a potentially very large societal impact, and we have to

be extremely careful both in the law and in treating younger people with these tendencies. We have to be really careful about how we treat them, especially given the fact that brains change both for the better and for the worse.

MR. CANNON: All right. Professor, here's my question. As you were talking about atheists and making some different sort of nuanced in how they approach their lack of faith, I was thinking that in our lives everybody here has experienced kind of three obvious categories of atheists, and the one is template of aggressive people who hate religion and are out to prove — proselytizers. They're evangelicals like our friend Hitch and Sam Harris and Richard Dawkins, who really hate religion and think it's a bad thing in the world and would like to stamp it out if they could.

Then the second category would be people who just don't think about religion. They're dismissive of God. They think religion is kind of stupid, but they don't care.

And then a third group would be people who don't believe but kind of wish they did, and they're not agnostic. They don't believe, but maybe they used to or their spouse does, and maybe they even go to church because of the kids, but they really don't think there's God, but they kind of wish they did think there was God.

Now, my question is in the scientific community. Did you find those dichotomies, and if so, how does it play out in these faculty lounges where people feel somewhat intimidated if they have faith?

Could you just talk about that?

DR. ECKLUND: So I didn't find as much the third category of don't believe but think they can. It may just be —

MR. CANNON: No, not think they can. Kind of wish they did.

DR. ECKLUND: Kind of wish they did.

MR. CANNON: Yeah.

DR. ECKLUND: It may be an artifact of how I did the study or something that may be there.

MR. CANNON: Okay.

DR. ECKLUND: But I did find definitely the first two kinds of categories, and I talk about sort of varieties of atheism in my book. So there's definitely a proportion of scientists who just think religious questions are just not important questions to be answering or asking.

That's very, very different than, you know, really thinking religion is dangerous in American society.

MR. CANNON: Right.

DR. ECKLUND: Right? That's very different in character.

In terms of playing out in the faculty lounges religious scientists perceive that all atheists — they sort of have the public's perception of atheists. So there's not very much because there's so little conversation. There's not very much nuance in how scientists view one another.

Does that get at your —

MR. CANNON: Yeah.

DR. ECKLUND: So there's just not very much public conversation. So they just don't know, they sort of take, you know, what the general line is on atheists as taking it for granted.

Now, I don't know the kinds of implications that has.

MR. CANNON: That's what I was curious about.

DR. ECKLUND: I perceive that you're asking a deeper question.

MR. CANNON: I was wondering if you had thought of — yeah, if you thought there were implications. Maybe not, but are there implications of the different types in science?

DR. ECKLUND: Perhaps, perhaps. I don't have any real data on it, but I think there could be implications.

MR. CANNON: Thank you.

ELIZABETH DIAS, *Time*: Elaine, I'm curious not just about the play out in faculty lounges of some of your research, but the play-out in actual scientific work and if these perceptions of discrimination are actually impacting the kinds of studies that people feel they can publish or if there's pressure from some of these different categories of atheists, yeah, back on to the religious scientists and what that looks like.

DR. ECKLUND: So, I mean, it's religious — I mean, it's interesting. I never asked religious scientists, "So do you do the same type of science as a non-religious scientist," but most religious scientists wanted me to know that they did the same type of science, which is interesting sort of social science finding when a group of people bring up something when you didn't — I'm like, "Oh, I didn't ask. Okay. I sort of assumed you did do the same type of science."

So they feel a little bit defensive about that, and so —

PARTICIPANT: They wanted to assure you.

DR. ECKLUND: They wanted to assure me that they did not think that intelligent design was accurate, and that they do the same — they practice the same scientific method as others do.

So sociologists of science will tell you that, you know, scientists are people, and they're influenced by things people are generally influenced by, like power structures and things like that. So I guess you could hypothetically conjure up a situation where, you know, these sorts of lack of conversations lead to not hiring of certain kinds of people.

I didn't find evidence for that necessarily, but you can imagine and does that have a negative impact on science. I didn't find any evidence for religious scientists doing something different with the actual nature of their scientific work.

But spiritual scientists really as much as those who are part of traditional religions said that they thought differently about the implications of their work when compared to their secular colleagues. Now, is that just a complex that they have, right? I mean, we sort of talked a little bit about this sort of complex sometimes that people have that they're being discriminated against whether or not they really are. So I don't know, but they did have the strong perception that they thought more about the implications of their work, the kind of impact that science would have on society when compared to their secular colleagues.

Did you want to ask a follow-up?

MS. DIAS: Sure. And then in terms of what the scientists did mention to you that they studied, I'm wondering if when it came to religiously sort of normative topics you think of scientists talking about, like homosexuality or stem cell research, et cetera, I'm wondering if there were any surprises that came up or that weren't just bound to the typical culture wars.

DR. ECKLUND: I did not find a difference. I was actually looking for that, Elizabeth. So I did not find a difference in the types of scientific topics that religious and non-religious scientists studied, and I asked sort of every scientist to give me a little bit about their research topics and things like that, and I didn't find those —

MS. DIAS: Well, you know, I'm actually asking what other kinds of religious topics did come up besides what we might think of as, you know, we would expect.

DR. ECKLUND: Well, they thought of religious topics as being — the religious scientists thought of topics like care for students and how you treat people in a scientific enterprise and things like that. So those are not culture war kinds of topics, but they perceived themselves as thinking differently about those things.

Now, in defense of atheist scientists, I didn't find any evidence that atheist scientists necessarily cared less about their students. We're talking about how do people perceive themselves, right, and how do groups, and so there's a strong perception among religious scientists that they think a lot more about being selfless in relationship to their students.

So you know, there's big pressure in science labs right now to say retain a graduate student who's really good, who can do a lot in your lab for more years rather than sort of see them through to the finish line quickly because it's helping your lab, and religious scientists told me often that, you know, they think more about, you know, what's going to happen to that student and what's best for the student.

So do I really have evidence that that's true, right? That's a different kind of study, but that's their strong perception. That was very much a religious topic.

The other big issues that came up were just sort of a generalized science ethics, you know, and you know, what we do with our research kinds of issues, and then practical things like who you take funding from. There was a big sort of anti-military funding strain among religious scientists.

MR. CROMARTIE: Let me say that we have just got a few minutes. So Lauren, you get to get the last comment and question.

MS. GREEN: Okay. I actually just have a question for each of you, and, Barbara, I'll just ask you first. In the neuroplasticity, I think it's a very, very interesting topic. Who would be like the top authority of like books we should be looking at in terms of that topic?

MS. HAGERTY: Okay. Well, one of the top scientists is Jeff Schwartz. He has written a book about it, and is in the process of writing another on it. He's at UCLA, and he wrote, co-authored a book with — a book called — an accessible book that has a lot of studies. It's called *Change your Mind, Changeyour Brain*. It's written by a science writer. Richard Davidson is one who has looked at neuroplasticity in meditation.

You know, to tell you the truth, I'm just beginning to look at this. I touched on it in my other book, but I think there's quite a bit of research. There is quite a bit of research that's coming out now. But if you Google Jeff Schwartz and get the book that he co-authored with the woman who wrote *Change your Mind,Change your Brain*, you'll — yeah, what's her name?

PARTICIPANT: Sharon Begley.

MS. HAGERTY: Sharon Begley, okay. So she has in her book, which is a couple of years old, but she has virtually all the research right now laid out in a really accessible way.

MS. GREEN: Okay, and Elaine, when you talk with scientists who were spiritual, this is a very interesting concept because of scientists basing their information on research and empirical evidence. What kind of spirituality were they practicing and what were they basing it on?

And I think it's a very interesting concept.

DR. ECKLUND: So there's — and this is true in the general population, too — there is a proportion of scientists, and forgive me that I don't have the numbers at the tip of my tongue right now, for whom spirituality is indistinguishable from religion, like that's not — those are just completely overlapping. Yes, I'm religious; yes, I'm spiritual those mean the same things for me.

But then there's a proportion of scientists, and I think spiritual atheists fit into this category, who see their spirituality as being very different from the general public. One, a spirituality which is very consistent with science, and when we do studies of spirituality in the general population, sociologists of religion find that the general population is not particularly concerned about, you know, being uber consistent with science or other.

There is almost this as I said before kind of socio-synchretistic. You know, I'm a little bit Catholic, I'm a little bit Buddhist. They're going to sort of pick and choose.

But there's much more of a quest for consistency among —

MR. CROMARTIE: Flexidoxy. David Brooks calls it flexidoxy.

DR. ECKLUND: Flexidoxy, yeah. So there's much more quest for consistency among scientists.

Scientists are also more concerned. I actually did a statistical analysis to see if scientists who were spiritual but not religious, sort of what kind of impact that had on practices like

volunteering, and there was a statistically significant difference between scientists who were spiritual and not in their volunteering, which was kind of interesting.

PARTICIPANT: Higher?

DR. ECKLUND: Higher proportion, and this was significant, not huge in magnitude, but it was a significant difference, which I found kind of interesting.

It doesn't, you know, going back to basic statistics, this does not imply causation, right? But that was an interesting correlation in light of what they had said to me in their interviews, that they see this as having a lot of implications for how they do science and how they think about their sort of role in the world and care for students, and these were very important to sort of a spiritual world view that was consistent with science.

But yet different, and I do think this is different in kind, than not being spiritual. It seems to be different than not being spiritual. So some in the scholarly community have been very cynical of this finding, saying, "Well, how does that matter? You know that's not religion in the original sense. Like what is that? Does it make any difference?"

It's different than saying that science has a totalizing world view. There's nothing else that's out there, you know. They're looking for something else, but they're dissatisfied with the traditional forms of religion that are in the general population.

MR. CROMARTIE: Okay. We appreciate you coming, and we are going to do it again. So thank you.

◆ **END** ◆