Good morning, students. Today, election day, is an important day in our nation’s history and for our nation’s future. I hope and pray that you have exercised your civic right and duty to vote today. If not, there is still time. I am delighted to have the opportunity to speak to you on this important day. But no, I am not going to speak about politics. Instead, I am going to talk about something equally as salient and most likely of more importance than who receives your vote today. I want to talk about an unnecessary battle that has been raging for centuries, a battle between faith and science. In this case, however, the conflict is tragic and completely unnecessary. It is a false dichotomy. In this case, you can cast your vote for both—for two avenues of seeking truth in a world in such desperate need of truth.

Truths found through faith in the Lord Jesus Christ and obedience to His commandments and truths found through the diligent study of His scientific processes here on earth can combine into a beautiful blessing of knowledge that can enhance our lives, save our children, bless our earth, and help us return to our heavenly home with the blessings of exaltation. Unlike the political turmoil raging in the heart of our nation today, this turmoil can be laid to rest. I hope that through my remarks today, I can help you take this first step toward peace and understanding.

Let me first start with definitions. All too often we find ourselves in a battle of semantics fueled by a misunderstanding of basic terminology. So let’s define these two symbiotic ways of knowing:

1. Knowing through scientific explanation is a process through which we gather evidence from the natural world to find explanations for natural phenomena.

2. Knowing through religious faith is a process through which we gather spiritual evidence through study and revelation to find explanations for spiritual truths.
Defining the Nature of Science

I will begin with the first. As a scientist, I find comfort and friendly familiarity in the walls of a scientific laboratory. I find joy and wonder in the beauty of logic and evidence and all things analytical. I find comfort and safety in the defendable explanations provided by science. It is just the way that I think—much to the chagrin of my husband sometimes, who wishes, and rightfully so, that I would use my “spiritual brain” a little more. So let me share the beauty I see with you so that you will better understand my obsession.

Science is a process through which we describe the natural world and find explanations for natural phenomena. In a beautiful editorial written by Dr. Bruce Alberts, a biochemist and then the editor in chief of the journal *Science*, Dr. Alberts explained the difference between “little-s science” and “big-S Science.” Little-s science is the process of experimentation through which big-S Science is eventually born. Little-s science is exciting, dynamic, collaborative, and wonderful. But it is tentative, amendable, and still under investigation. “[Big-S] Science emerges from [little-s] science” as “collective, public knowledge; . . . universal and free of contradiction,” but only after repeated confirmation by independent, robust investigations. Often we get caught up in the little-s science and impatiently reject a scientific idea simply because it is in its infancy and may seemingly contradict what we think we know from a religious standpoint. Other times we foolishly reject big-S Science because we don’t fully understand how it plays in harmony with our religious beliefs. Both are errors born of impatience. I will talk more of that in a moment. But let me quote President Gordon B. Hinckley in praising the benefits of science to mankind:

[The twentieth century] has been the best of all centuries. . . . The life expectancy of man has been extended by more than 25 years. . . . The fruits of science have been manifest everywhere. . . . This has been an age of enlightenment.3

I want to focus a little more on little-s science—how is science done? We are going to do a little virtual activity. Let me start with a short video clip. [A video was shown.4 The transcript follows.]

To start off, we will observe several students participating in an in-class activity to better understand what a theory is for scientists. All of these students are being presented with a Lego structure made up of a few dozen pieces concealed in an opaque cloth bag. They are instructed to build a structure identical to the one inside of the bag, but they are not allowed to look in the bag. Instead, they are only allowed to reach into the bag and feel what pieces go where. They are also given a large amount of Lego pieces, which not only include all the pieces they need to build the structure but several other pieces that are not needed.

Now that the students have built a structure they believe to be identical to the mystery structure inside of the bag, they are given time to compare their product with their classmates’. Although there were mostly minor differences, some students had used the cylinder while others had used the Lego head in a particular spot. Additionally, some students used two smaller blocks instead of one larger one in another spot. Lastly, the colors for all of the bricks are different. How can these students resolve their differences? They need to collaborate and get more data, so they will discuss their differences and reach back into the bag to come to a consensus.

After a bit of fine tuning, the students have the same structure—for the most part. However, the color conundrum has left some scratching their heads. How can they decide on what color is right? Or is that even possible?

This activity is designed to illustrate the process of science. The structure inside the bag represents the truth. As scientists, we are in search of the truth, but we have to work with the tools and evidence available to us. So we make hypotheses about the natural world and we test them by gathering data. In this analogy, we might hypothesize that the piece on the bottom is a Lego head, not a cylinder. We would reach in the bag, feel, take measurements, and gather all available data to us. We would then collaborate with fellow scientists who have also performed similar experiments and collectively decide on
the conclusions most supported by the data. After testing and confirming many related hypotheses, we would form an overall structure of the truth, a structure that incorporates our many different hypotheses. We call this explanatory structure a “theory.”

A theory is a broad explanation of a group of related phenomena that is based on the best evidence we can gather. Notice that the scientific term theory is very different from the common vernacular use of theory as just a guess or a hunch (such as, I have a theory about why he didn’t call me back for a second date). In the scientific definition, a theory is the best and most well-supported explanation we have. If I were to ask those students, after they had worked on their structures for an hour and collaborated with each other, “How sure are you that you’ve got the structure right?” they would all answer that they were completely sure, or at least 99.9 percent. However, if I asked them how sure they were of the color of the pieces, they would answer, “Not sure at all.” So there are aspects of theories that we haven’t quite worked out yet.

In the case of the Legos, I gave students the stipulation that they could not look in the bag. If we were talking about the evolution of the diversity of life, for example, we can’t go back in time and see it occur. We can’t ever “look in the bag.” So there are some things about the process that we may not ever know. But we can see the evidences of what occurred all around us. In the case of Lego color, the students couldn’t figure it out given the current equipment and stipulations I gave them. But perhaps in the future we will invent an infrared device that can shine on the Lego pieces in the bag and illuminate their colors without us actually looking at them.

So it is possible that we will get a more and more complete understanding of the truth as science advances and we are able to gather more data. But for now, we can feel pretty assured that we have got the structure down, even if we are unsure of the colors. And we can trust that scientists will continue studying the nuanced details of these theories to try to get closer and closer to absolute truth. So how sure are we of scientific theories? Pretty darn sure.

Defining the Nature of Faith

Now let’s talk about the nature or seeking of religious truths. It is an entirely different epistemology, but it is not entirely different in the process. The main difference is in the evidence. When I was in graduate school, my major professor often challenged me about my belief in God and how I could possibly reconcile it with the science I was studying. He was clearly not a believer. I argued that the God hypothesis is not testable through scientific means. He argued that it was testable and that the evidence clearly showed that God does not exist. He claimed that religious people accept without evidence and would even ignore the evidence against God if it was presented to them.

I answered back that although I was religious, I was not one who accepts without evidence. When I was seventeen, I decided to find out for myself if God was real. Since then, I have been convinced again and again, by evidence, that God does, in fact, exist. Unfortunately, the type of evidence I have to offer is mine, and mine alone. It is not the type of evidence that I can share with anyone else because it is based on intense, undeniable feelings as well as personal experiences that wouldn’t mean the same thing if I explained them to someone else. However, I have performed tests.

Let’s take a simple example in the Book of Mormon. At the end of the book, Moroni offered us a test. He said:

_Behold, I would exhort you that when ye shall read these things, if it be wisdom in God that ye should read them, ... 

. . . that ye would ask God, the Eternal Father, in the name of Christ, if these things are not true; and if ye shall ask with a sincere heart, with real intent, having faith in Christ, he will manifest the truth of it unto you, by the power of the Holy Ghost.

And by the power of the Holy Ghost ye may know the truth of all things. [Moroni 10:3–5]_

So here is a clear test with a clear prediction:

- Test: Ask God.
- Prediction: If this record is true (my proposed hypothesis) and I ask God (my experiment is to
pray about it), then I will be given confirmation by the Holy Ghost (the evidence).

Here is where the processes differ: the evidence here is different. It is not tangible, measurable evidence by a scientific definition, but it is real evidence nonetheless. However, this test assumes that you know how to recognize the Holy Ghost and the evidence—in other words, that you have the necessary tools to detect the evidence. These spiritual tools take practice to develop, but they do exist and you can develop them. In terms of science, there is nowhere that this type of hypothesis testing fits in. However, this is not to say that this “spiritual” hypothesis testing is in any way less valid. It is just a different way of approaching truth.

Interestingly, my professor’s response to this was, “Thanks for sharing. I think you have made your case very clear. As I think you said, your type of [spiritual] evidence cannot count as scientific evidence. Recall that replication by others is a key. Can others replicate your test and get the same results (which must be open for all to see)? If not, then it does not count.”

I did not respond to this, but I should have responded with, “Absolutely! And I’ll teach you how!” What a wonderful missionary opportunity I missed! This test is absolutely, 100 percent repeatable, and everyone can receive the spiritual evidence if they choose to develop the spiritual tools necessary to detect that evidence.

Science as an Agnostic Approach

I want to go back to something my professor had claimed: that the scientific evidence proves there is no God. He is greatly mistaken, and this misconception has driven many people away from God in their pursuit of science. This misconception is that science is atheistic.

In a well-done study at Arizona State University, my colleagues surveyed more than 1,000 college students and found that 48 percent of them believed that in order to accept evolution, you have to reject God. They also found a direct negative correlation between this atheistic viewpoint and acceptance of science.\(^5\)

This misconception is harmful and counterproductive to science and religion, as it drives an unnecessary wedge between these two ways of knowing. Science is no more atheistic than it is theistic. There is no scientific evidence for or against the existence of God. As we have already discussed, the evidence of God’s existence does not even belong within the epistemology of science; it is a different epistemology altogether. Science is agnostic.

Francis S. Collins, director of the National Institutes of Health, was recently awarded the Templeton Prize for his work in reconciling science and religion. In his acceptance address, he described his previous attempt to prove atheism. He said:

>I began a journey to try to understand why intellectually sophisticated people could actually believe in God—and, to my dismay, I found that atheism turned out to be the least rational of all the choices! To quote Chesterton, “Atheism is . . . the most daring of all dogmas, . . . for it is the assertion of a universal negative.” Scientists aren’t supposed to do that, [he remarked with a chuckle].\(^6\)

Let me provide a simple definition of these three terms:

- **Atheism**: the belief that there is no God.
- **Theism**: the belief that there is a God.
- **Agnosticism**: the absence of belief.

In science we never say, “I believe in gravity” or “I believe in evolution.” Rather, in scientific hypothesis testing we “accept gravity as the best explanation for phenomena such as an apple falling from a tree” and we “accept that evolution is the best explanation for the existence of modern-day diversity.” There is no belief involved. Science, as a way of knowing, is an agnostic approach. To claim that science proves there is no God is just as unscientific as claiming that science proves there is a God. In other words, being an atheist is just as much a belief system as theism!

I recently conducted a workshop for biology professors to offer them tools to teach evolution
to religious audiences, and I taught this important principle—that science is agnostic. I got this response from one of the participants:

Earlier this summer I attended your evolution reconciliation session. . . . I went into it with the following mindset: . . . I believed that God or “something bigger” couldn’t possibly exist, because there was no evidence for it. . . . But in . . . your discussion, OMG[osh] science supports agnosticism! Because there is no evidence God could exist or not exist, we cannot make a conclusion. This blew my mind. . . . I don’t think I can identify as an atheist anymore.

This mindset, if taught to our youth and if understood by us all, can potentially dissolve the artificial wedge we have driven between science and faith.

The God of the Gaps

This brings me to another important principle I would like to discuss that, if understood correctly, can help to save your faith. This principle is to avoid a “God of the gaps.” What is a God of the gaps? It is when an individual inserts God as an explanation for anything that science cannot currently explain. For example, the ancient Greeks created gods to explain weather patterns for which they had no current explanation (for example, Zeus was the god of lightning and Poseidon the god of earthquakes and hurricanes). However, once science became advanced enough to explain these phenomena, their gods disappeared.

It is dangerous to believe in God because His existence resolves uncertainty or His existence explains things that you cannot explain. (For example, How can lifeforms be so complex? They must have been created in their present form by God.) What happens when science comes up with a reasonable and even testable explanation for this “gap” in our understanding? (For example, evolution has led to the great diversity of life we see.) Does your faith disappear just because something you attributed to God can be explained by science? It shouldn’t and it won’t if your belief is not based in gaps. A paradigm shift must occur such that your belief in God is for an entirely different reason—not because He can explain the gaps in your current understanding but because He gives you spiritual understanding and you have felt His presence in your life (again, this is spiritual evidence, not scientific evidence).

Let me share, just briefly, an experience I recently had. This is going to sound like the start of a corny joke, but bear with me. I was sitting in a restaurant in Washington, DC, with a Catholic priest and a humanist. (By the way, humanists believe that human experience and rational thinking provide all knowledge and morals; they reject the idea of a God.) Both men have become friends of mine through my work on the Broader Social Impacts Committee of the Human Origins Project at the Smithsonian. We were discussing morality and what it meant for the existence of God. The priest, taking somewhat of a God of the gaps approach, suggested that human morality is direct evidence of the existence of God, that we can’t explain it scientifically so we must attribute it to God. The humanist, taking a secular approach, suggested that moral tendencies simply increase fitness and are therefore evolutionarily selected for. In other words, those who naturally tended to be kind and not kill each other, through genetic programming, were more likely to be welcomed into society, chosen by a mate, and able to pass on those moral genes. I agreed with the humanist; this idea has been well-studied and well-supported by scientific study.

However, my response to both of them was this: Whether human morality evolved or was endowed upon us by God is irrelevant to my conviction that God is real. I believe in God because I have evidence of a different kind—a nonscientific kind, but real nonetheless. I believe God exists because He has spoken to me in very real ways, because I feel His presence in my life, and because I have chosen to open the lines of communication with Him and He has made Himself known to me. This looks different for everyone because everyone has taken different efforts to allow God into their lives. But it is available to all. Christ taught that if you will build your foundation upon Him and His teachings, rather than on unexplainable phenomena and whims of mysticism, when the rains descend and the winds blow and the doubts
beat upon your house, you will not fall, for you are built upon a rock (see 3 Nephi 14:24–25).

Comfort with Uncertainty

I want to discuss another issue that helps preserve your faith, and that issue is dogmatism versus a comfort with uncertainty. In our world today, dogmatism abounds. **Dogmatism** is “the tendency to lay down principles as incontrovertibly true, without consideration of evidence or the opinions of others.”

Does this sound familiar in today’s political climate? Well, it also abounds within the realms of both science and religion. In science, there is a growing extremism, called scientism, that claims science is the only source of knowledge and any pursuit outside of that is fantasy.

Dr. Thomas Burnett, a philosopher and science historian, aptly put it this way:

*It is one thing to celebrate science for its achievements and remarkable ability to explain a wide variety of phenomena in the natural world. But to claim there is nothing knowable outside the scope of science would be similar to a successful fisherman saying that whatever he can’t catch in his nets does not exist. Once you accept that science is the only source of human knowledge, you have adopted a philosophical position (scientism) that cannot be verified, or falsified, by science itself. It is, in a word, unscientific.*

Likewise, we find extreme orthodoxy within religion that rejects all other avenues for seeking truth, claiming that truth can only come from revelation concerning the creation of our beautiful world and all other aspects of human life. Both worldviews put limits upon human inquiry. Neither reality is a healthy place in which to live and to learn and to progress. We must become more comfortable with uncertainty. Think about it: From a spiritual standpoint, how many of you would claim that you know everything there is to know about the gospel of Jesus Christ? I certainly wouldn’t claim that! Likewise, no self-respecting scientist who truly understands the nature of science would claim that we know all truths about the natural world. We still don’t fully understand all the causes of cancer or how to cure it. If we thought we knew everything, the scientific enterprise would come to a screeching halt! Thankfully, the more I learn about science, the more I understand the depths of that which we are yet to know.

Dogmatism in science or in religion closes down your ability to learn and progress. If something seems to conflict between what science reveals and what you have learned through your religious faith, don’t abandon one or the other. Hold off judgment, be patient, and keep an open mind to truth from both sides.

When he was an apostle, President Russell M. Nelson said at the dedication of the BYU Life Sciences Building, “There is no conflict between science and religion. Conflict only arises from an incomplete knowledge of either science or religion, or both.”

Do not be so proud that you cannot accept that you may not know everything. Be patient and stay faithful, and, in time, understanding will come. And please keep in mind that your eternal salvation does not depend on your complete understanding of science. If learning scientific theories puts your faith in jeopardy, choose your faith! Choose your faith until you can better understand the science—or until science can provide better explanations. I firmly believe that both truths—religious and scientific—exist in harmony.

Bringing Faith and Science Together

Now that we have discussed and hopefully better understand these two epistemologies, I want to turn my discussion to how using both ways of knowing can deeply bless your lives. Let me share an example of how it has profoundly blessed my life in the midst of deep trial and sorrow.

After I had been married for a few years and just before I finished my master’s degree at BYU, the Lord blessed us with a child. Everything seemed normal with the pregnancy, until I delivered. Thankfully my son was just fine, but I nearly bled to death during the birth and then again six weeks later. It turns out I have a condition called Asherman’s syndrome, which causes excessive growth of scar tissue in my womb. As a consequence, when I get pregnant, the baby’s placenta grows lobes in and around scar tissue, resembling
more of an octopus than the nice round organ that it is supposed to be. It also makes delivering the placenta extremely difficult. However, we did not learn this at the time, and after an emergency dilation and curettage procedure, I thought all was well.

Upon becoming pregnant with our second child during my PhD program at Arizona State University, signs began to indicate that all was not well. After a frantic drive to the emergency room in the middle of the night because I had awoken in a pool of blood, we found out that our precious baby had implanted right at the opening of the cervix—a condition called placenta previa—having nowhere else to go due to scar tissue. After six more months of hospital visits, scares of losing the baby, and being driven around in a disabilities cart to all my classes at ASU, I delivered a second healthy baby boy. And, once again, I nearly bled to death, this time quite significantly, to the point of having some serious complications and needing blood transfusions. It was then that I discovered my problem and was told that I would likely not be able to have any more children.

Now I had two beautiful boys, and I certainly felt blessed beyond measure, but I had always had it in my mind that I would have a bigger family, and this news was devastating.

At this point I had two problems to fix—two puzzles to solve—and I needed two solutions:

1. My soul had been injured. I longed for more children and my heart ached. How would I heal my soul?
2. My body was broken. How would I heal my body?

I know that the Lord can do all things. He could remove my trials from me and grant me a miraculous healing, without me lifting a finger. But I can tell you with fervent belief that my trials have a purpose; they have made me stronger and more empathetic. I am grateful for my trials. As the Lord explained to Joseph Smith:

*If fierce winds become thine enemy; if the heavens gather blackness, and all the elements combine to hedge up the way; and . . . if the very jaws of hell shall gape open the mouth wide after thee, know thou, my son, that all these things shall give thee experience, and shall be for thy good.* [D&C 122:7]

So I needed this trial, and the Lord had a plan. I could have just sat back and prayed, putting all responsibility on God, and waited for Him to bestow a miracle upon me. Instead I went and searched diligently “out of the best books” (D&C 109:7), learned all that I could learn, and sought the guidance of the medical community in helping me navigate these uncharted waters—all with a prayer continually in my heart that God would help me bring my own miracle to pass.

After finding a world-renowned surgeon who specialized in Asherman's syndrome, my husband and I headed to California for several surgeries, long agonizing nights in hotels with me sick from pain medications, and complicated recoveries.

But a year later I brought my son Gage into the world, and after another round of surgeries, I brought my fourth son, Emmitt, into the world four years later. I have been greatly blessed. So many women with this condition never have children at all, and I feel deep sorrow and sympathy for their plight. For whatever reason, the Lord saw fit to bless me with a miracle. But that miracle came about through the angels who work in medicine and the healing of my soul through much prayer and supplication. I am grateful that I can have both at work in my life.

**Act—Do Not Just Be Acted Upon**

Let me share another story. When I was a young child, I suffered from anxiety that often manifested itself as a sour stomach. There were many nights when you could find me stranded in the bathroom praying my little heart out for relief. My mom would always say to me, “God helps those who help themselves,” as she would hand me a cup of baking soda water to drink. The stuff was nasty, and I would have rather just had God come down and answer my prayers. But it turns out the baking soda water *was* the answer to my prayers, and it worked every time. (I guess my mom was unaware of TUMS!)

Speaking of agency to a group of African Saints, Elder David A. Bednar stated, “You and I
are agents. We have the power in us to act, not simply to be acted upon.”¹¹ The Lord has given us agency, and with that, He expects us to act using all the knowledge and understanding we have gained here on earth. I firmly believe that God wants us to act upon our scientific understanding and bring about God’s blessings of healing and a better life. God has given us the gift of intellect, and He expects us to use the laws of nature to better our lives.

When my son was just six years old, he suffered a physical attack that caused his fragile young mind to “break,” as it were. Prayers and fasting, pleading with the Lord, and years of medical attention and amazing medications have brought him back from a seemingly hopeless place to a happy and healthy life. It was not just prayers that helped him, although those certainly helped. It was a use of the knowledge the medical community has gained that ultimately brought about God’s miraculous gift of healing. We acted instead of just being acted upon.

Through this experience, I learned something about the Atonement that I hadn’t understood before, even after growing up in the Church. I always thought the Atonement was just for sinners. But it goes so much deeper than that. When Christ was suffering in the Garden of Gethsemane, He felt all the pains and sufferings of us all.

Elder Neil L. Andersen said:

Our Lord and Savior, Jesus Christ, through the incalculable gift of His Atonement, not only saves us from death and offers us, through repentance, forgiveness for our sins, but He also stands ready to save us from the sorrows and pains of our wounded souls.¹²

The pain that Christ felt was so great that He bled from every pore. It wasn’t just godly sorrow for wrongdoing—it was the pain of a mother longing for children, the pain of a parent whose child had been harmed, and the pain of a child who suffers trauma. It was all the pain we would ever suffer. And thus the Atonement is for that, too. It can help my suffering heart to heal, it can give me the strength to forgive those who have harmed me or my family, and it can comfort my children through their pains and sorrows. It can comfort you through yours. It is for all of that—not just for sin.

The deep and profound spiritual understanding of truth has aided in our family’s healing process in a way that scientific understanding never could. Likewise, the scientific understanding that helps us deal with the physical realities of Asherman’s or of my son’s trials have equally impacted our healing process. Without these beautiful truths discovered through science, our lives would be crippled and we would not have become who we are today. It is these two ways of seeking truth brought together in harmony that have healed and continue to heal my soul.

Conclusion

Symbiosis is a term we use in biology to indicate an interaction between two different organisms living together in a dependent and often beneficial relationship. Likewise, faith and science should live symbiotically in our hearts and in our minds as we search for truth in our lives. Let me share one last story about a little book that my son built while sitting in sacrament meeting one Sunday morning—totally unprompted by me, I might add.

On one side of his book he had written, “The Book of God,” and on the other cover, “The Book of Plants.” On the inside, he had me write a scripture from Revelations—one he was practicing for Primary that week—on one page and a list of his favorite garden plants, including “moonberries,” on the other page. For him, the wonders of the scriptures and the wonders of science easily fit within the same book with absolutely no conflict.

That we may all have such pure and simple understanding of these symbiotic pathways to truth is my humble prayer, in the name of Jesus Christ, amen.

Notes

4. “Video #1: How Is Science Done?” RecoEvo SHARE series, Reconciling Evolution, BYU Biology Department, 0:05–1:36, biology.byu.edu/reconciling-evolution/recoevo-share-tool.


7. An anonymous, personal communication; emphasis in original.

8. Lexico.com, s.v. “dogmatism.”


