



Institute For Theological Encounter With Science and Technology

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Where 200,000 or 300,000 are Gathered Together in My Name ...

The 41st March for Life took place in Washington DC on January 22, 2014, the anniversary of the infamous Roe v. Wade Supreme Court decision that legalized abortion. It is completely astounding that so large a throng would assemble on such a bitterly cold day. The dedication of people traveling from places like Oklahoma, New Orleans, St Louis, etc. is unmatched in American history.

It is worth pausing to ask why anyone would make that effort, year after year in so many cases. Why not just stay home (keeping warm) and write letters to editors or members of Congress? Perhaps the answer is akin to the reason we attend church: to assemble as a community that strives to follow Christ, to spread his message to all. Being present at church, we are united in a shared celebration of Christian love. For many of us, the holy sacrifice of the Mass elevates our spirits to a level inaccessible from conventional everyday life. Perhaps the action of physically being there among the throng brings home the unity and renews the commitment to the reality of Christ's presence among us.

The Culture of Life Foundation put it this way:

“We march... To Encourage. We march to encourage pro-life politicians and legislators to continue in their efforts to protect the unborn and the sanctity of human life on the legislative level. We march to encourage individuals who work for pro-life organizations and pregnancy centers to continue the work they do every day to promote a culture of life. And we march to encourage those fighting in the courts for the cause for life to stay the course.”

If everyone paid attention to science, we would have won this fight hands down years ago. A new human life begins at conception, when the newly formed DNA begins its inexorable development into a fully formed human being. There is no discernable transition point, no specific time when God, like an assembly-line worker, reaches down and inserts a soul. God was smarter than that and He designed the system better. What we see through a microscope (or an electron-microscope for super magnification) presents the scientific facts quite clearly. The only difference is that these new human beings are extremely small at first.

Unfortunately, not all that many people are skilled in science, and there are many instances where personal convenience blinds a person to scientific reality. Fortunately, the invention of the ultrasound scanner has enabled a visible image of an unborn child to be seen by all except those who refuse to look; and some state laws are being revised to make that refusal more difficult. But still there are many who think only of their own convenience.

Thus the task of dealing with real people demands personal attention by dedicated pro-life individuals. It is the loyal friend, not the distant scientist, who can bear witness to the love, fidelity and support of Christ and His people in helping a woman choose life and carry through an unplanned pregnancy. As St. Paul reminds us (1 Corinthians 13, 1-2), it's nice to be right scientifically, but we have to be loving, too. The annual March for Life renews our commitment to bring Christ's love to distressed mothers.

Thomas P. Sheahan

Director: ITEST

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Announcements

Spring Workshop - Faith/Science Challenges

ITEST and the MAGIS CENTER of reason and faith, are teaming up to present a workshop titled, "Faith/Science Challenges: The God Question – How do We Answer it? Do Teens Really Care?" Slated for the weekend of May 2-4, 2014 at the Rigali Center in St Louis, the workshop will feature Father Robert Spitzer, SJ, founder and director of the Magis Institute, who will deliver the keynote address, *Evidence for God from Contemporary Physics and Philosophy*.

We are inviting all ITEST members to attend Father Spitzer's opening address free of charge. The discussions during the Saturday sessions will cover pertinent topics selected by the invited teachers, administrators and parents of teenagers who will contribute their time and experience to this project. The groups will work toward achieving the goal of this workshop which is to create an outline or blueprint of topics that can be used in courses dealing with challenges to faith for high school students. The ITEST Board of Directors voted to hold this workshop in the spring instead of during our usual meeting in the fall. However, if it is feasible, we will hold an ITEST conference/workshop in the fall. Please let us know of any timely faith/science topics and speakers you would suggest for a fall meeting.

Membership Renewal Reminder

First Renewal notices were sent in November, 2013. If you haven't renewed yet, please submit your dues as soon as possible. We would prefer to save money on postage (49¢ per ounce) by not having to send a second renewal letter. If you cannot afford the \$75.00 dues, please give what you can afford.

Funding Received

Celebrate our good news with us! The **Our Sunday Visitor Institute** recently awarded partial funding in the amount of **\$23,225**. to ITEST for the collaborative workshop noted above. Our gratitude to the OSV extends

over many years: The OSV has been an important financial and moral support for ITEST, showing strong confidence in the faith/science mission and ministry of ITEST. A second award arrived just before Christmas from the **Dr. Scholl Foundation**. Through the generosity of Ms Pamela Scholl, we have received a **\$5,000**. award for the high school project. Through the gracious efforts of Fr. Bill George, SJ, ITEST received \$10,000. from The Reyes Family in Chicago. At this time, we extend special thanks to selected ITEST members who donated up to \$1,000 each, thus matching a \$10,000 donation from an anonymous donor. It may appear that we are "living in the lap of luxury", but we are still a mendicant not-for-profit entity which "stewards" its resources frugally and wisely.



Tom Sheahen, our director, takes the case for life to the steps of the Supreme Court at the March for Life in DC.



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God the Father of Creation: Reflections of a Vatican Scientist

by Br. Guy Consolmagno SJ

*(This essay was originally given as a talk to the Florida Council of Catholic Women in 1999, and later condensed for a chapter in my book *God's Mechanics*. The complete version has not been published before.)*

Jesus, as the incarnate Word, is relatively easy for most people to picture; and for all the talk of “spirit” that fills our hymns and our daily conversation, whether we’re talking the “spirit of the law” or “school spirit,” you’d have to assume that at least we think we know what we mean by that term. But what can be said about God the Father?

The documents from the Vatican itself don’t help that much. Much of their emphasis is on using the image of God as Father to promote the sense of shared brotherhood and sisterhood among all of us who would call God, Father. And that’s fine as far as it goes — though I must confess, when I was growing up I never could figure out how “treating all men as my brother” could possibly be a good idea, considering how my brother and I used to get along...

But God the Father?

The Apostle’s Creed, one of our most ancient prayers, puts it succinctly. We believe in God the Father, Almighty, Creator of Heaven and Earth. And that’s it. “Jesus Christ, His only Son, Our Lord” gets all the rest of the press.

Creator of heaven and earth. All that is seen and unseen, adds the Nicene Creed. And that’s it. But of course, that’s everything.

Creator of Heaven and Earth. What does that mean, what has that meant, to us humans?

It means a lot to me as a scientist. To believe in the God of *Genesis*, who creates the world in an orderly fashion and calls it “good”, is the foundation of all my work.

Every scientist, believer or not, makes three basic assumptions before starting any scientific work. First, you must assume that the world does make sense, even if the sense can’t be easily seen. The Universe is intelligible. There is some kind of logic and order and regularity to it. If you think that the universe is nothing but chaos, totally arbitrary and random, like the cultures of India and the East do, then — like India and the East — you may develop wonderful philosophies and even phenomenal mathematics, but you’ll never see any point in studying natural science. You’d think there was nothing there to be studied.

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Brother Guy Consolmagno SJ

Brother Guy Consolmagno SJ is an astronomer and curator of meteorites at the Vatican Observatory. A native of Detroit, Michigan, he earned undergraduate and masters’ degrees from MIT, and a Ph D in Planetary Science from the University of Arizona, was a postdoctoral research fellow at Harvard and MIT, served in the US Peace Corps (Kenya), and taught university physics at Lafayette College before entering the Jesuits in 1989.

At the Vatican Observatory since 1993, his research explores connections between meteorites, asteroids, and the evolution of small solar system bodies, observing Kuiper Belt comets with the Vatican’s 1.8 meter telescope in Arizona, and applying his measure of meteorite physical properties to understanding asteroid origins and structure. Along with more than 200 scientific publications, He is the author of a number of popular books including *Turn Left at Orion* (with Dan Davis), *Brother Astronomer*, and *God’s*

Mechanics. For the International Year of Astronomy he edited *The Heavens Proclaim: Astronomy and the Vatican*. He also has hosted science programs for BBC Radio 4, been interviewed in numerous documentary films, and writes a monthly science column for the British Catholic magazine, *The Tablet*.

Dr. Consolmagno’s work has taken him to every continent on Earth; for example, in 1996 he spent six weeks collecting meteorites with a NASA team on the blue ice regions of East Antarctica. He has served on the governing boards of the Meteoritical Society; the American Astronomical Society Division for Planetary Sciences (of which he was chair in 2006-2007); and IAU Commission 16 (Planets and Satellites). In 2000, the small bodies nomenclature committee of the IAU named an asteroid, 4597 Consolmagno, in recognition of his work.

But a creator God, the God of the holy books of Judaism, Christianity, and Islam, gives hope that there is a rhyme and reason to the way things work...no matter how hard it may be to fathom those reasons, they're there for us to ferret out eventually. That may be one reason why natural science flourished in the West and not the East.

The second assumption of every scientist is that this understandable universe can be understood *by us*. It's not enough to know that the rules exist; we also have the arrogance to think that, at least in some small and incomplete way, we can grasp them. You'd think we imagined ourselves as having, in ourselves, the "image and likeness of God." Where did we ever get such a notion? But again, without that belief there's be no point in doing science.

The final assumption is the wildest of all. Every scientist must accept, as a tenet of faith, with no reason to believe it ahead of time, not only that the world is understandable; not only that we can somehow be capable of grasping that understanding; but finally, that understanding the world is a worthwhile endeavor.

I refer you again to the Eastern religions, and indeed to the heresies that regularly arise here in the West — most recently in the New Age movement, full of ideas that are hardly new. They maintain that only "spiritual" matters count and that the physical world is something we should "rise above."

In contrast, God the Father, the creator, in *Genesis* says that His creation is good. And God the Father, in the New Testament, so loved the world that he sent his only begotten Son. As Saint Athanasius put it back in the year 300, in the Incarnation the whole universe has been "sanctified, quickened and cleansed by His Indwelling."

What's more, Saint Paul tells us in his *Letter to the Romans*, "since the beginning of time the Creator has made himself known in the things that have been created." That means, to know creation is to get to know the creator. God the Father. Natural Science is an act of worship.

It's not an option; it's a commandment. The First Commandment. We are to adore God with our whole heart and our whole soul, every fiber of our being. That includes our brains. God calls us to be scientists.

Yet today, so many people assume that science and religion are somehow at odds. Where did that idea ever come from?

Science developed directly from the scholastic thought of the church's medieval universities. Astronomy was one of the seven subjects they required you to master before you could go on to do philosophy and theology.

Saint Albert the Great, who taught Thomas Aquinas his theology, wrote on botany and minerals and fossils and is known today as the Father of Geology.

The monk Roger Bacon is the father of Chemistry; more recent churchmen in science include Gregor Mendel, the monk who discovered genetics; Angelo Secchi, the Jesuit priest who first took the spectra of stars and thus founded the science we now call astrophysics; even the Big Bang theory got its start in the work of Fr. Georges Lemaitre, a Belgian priest of this century.

Jesuit priests mapped the Moon, invented the modern atomic theory, devised the wave theory of light. And even the laymen giants of Renaissance science considered themselves to be religious men; Newton and Kepler and Copernicus and, yes, Galileo, all were men of high devotion. Don't forget, even though he could have fled Italy and his trial, for love of the Church Galileo submitted, and accepted the infamous ruling against him.

The split between science and religion is primarily a nineteenth-century phenomenon. It arose in America and England when devout but poorly educated Protestant preachers misinterpreted the Bible. They preached in ignorance of the long tradition of the Church, explicitly stated by Origen in the 200's, Saint Gregory of Nyssa in the 300's, St. Augustine in the 400's, and again quite strongly by Thomas Aquinas, that the Bible is a holy book about God, speaking of things that no words can contain by using the words of poetry. Indeed, the whole point of Protestantism was to reject Tradition, leaving themselves open to these Biblical misinterpretations.

It also arose because, at the same time, scientists of the 19th century who were educated without philosophy or religion arrogantly assumed that their classical physics was on the brink of explaining everything, even the acts of individual humans, in terms of deterministic, mecha-

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nistic laws. When the mathematician Laplace explained his equations for the orbits of the planets to Napoleon, the emperor asked him, "What role does God play in your theory?" And Laplace replied, "I have no need for that Hypothesis."

Both religion and science can share the blame for this split. As a Jesuit and a scientist, that means I get a double dose of guilt!

Of course, the 20th century has done a lot to temper the ignorance and arrogance of both camps. Despite what you may believe reading the papers, most Christians — even Evangelicals — are not Creationists. Of course, the Catholic Church has always condemned Fundamentalism as a heresy. But you may be interested to know that there's a large group of Conservative Evangelical Protestant scientists, called **the American Scientific Affiliation**, who are working to educate their fellow Evangelicals away from this false interpretation of the Bible.

And likewise, twentieth century physics has been humbled on two counts. First, the insoluble problems of classical physics finally led to the rise of Relativity and Quantum Mechanics, and a view of the universe that is no longer totally mechanistic nor deterministic. And secondly, every scientist with any sort of soul cannot help but be given pause by the abundant evidence of the horrors -- from pollution to modern warfare -- that result when science and technology are allowed to reign unconstrained by morality and ethics.

You know, I had been a scientist for fifteen years, working in the field of planetary science, on the origin and evolution of our solar system and the planets within it, before I became a Jesuit. I was a good Catholic all that time, but I kept that side of me private. When I became a Jesuit, when I became a "public Catholic" so to speak, an interesting thing happened. At every scientific meeting, wherever I went, people I'd known for years in the field -- including some of the most prominent members of my field -- would come up to me, to tell me about their churches, to tell me about their faith. **It seems most scientists -- at least, most of the astronomers of my acquaintance -- are believers. It's just that they, too, consider that to be a private side of their lives.**

So why does this story of a split between science and religion persist? Because most scientists keep their religion

private -- which is their right. Because too many religious people have been scared off of science precisely by the stories of this split. Because the ones who do speak about these topics are people with a very limited education in science -- the Creationists -- or a very limited education in religion; people like Carl Sagan or Stephen Jay Gould who are probably not the best representatives of their fields... just the best-known.

But there's a deeper reason why this split arose, and why to some degree it's not going to go away soon. Ironically enough, it comes from many of the very people who would most want to heal the rift.

Modern atheism arose, according to a very persuasive work by the Jesuit Fr. Michael Buckley, precisely when the theologians of the 17th and 18th centuries tried to use the best science of their day to "prove" God. In the process they made two fundamental missteps. Either they reduced God to the "prime mover" who started up the Universe at the beginning, and then stepped back and let it run on its own accord. Or they used God as the explanation of all the things that science couldn't explain... yet. The God of the Gaps. As science progressed, and the gaps got filled, God got squeezed out of the picture.

Laplace's retort -- "I have no need for that Hypothesis" -- was in fact well taken. His mathematics had solved problems in the orbits of planets that Newton had assumed were merely the visible hand of God. Laplace rejected both bad science -- Newton's incomplete calculations of planetary motions -- and bad theology: the God of the Gaps.

A modern version of this can be found in the writings of religious apologists who would try to cram 20th century theories of cosmology into the "seven days of creation," or who use our ignorance of the beginnings and ends of creation, or the uncertainties of quantum theory, to identify the places where God acts in the universe. Yes, with a little pushing and shoving you can bend 20th century science into a form that looks like traditional religion. But 20th century science is guaranteed to be obsolete in the 21st century. Just as the Babylonian cosmology of 1000 BC looks primitive to us today, the Big Bang Cosmology of 2000 AD will probably look pretty primitive in the year 5000. Yet the fundamental truths of the Bible, that God is a loving creator responsible for this universe, no

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matter how we understand it, is a truth that will never be obsolete. To reduce the Bible to a science textbook does it no favors. Science textbooks go out of date. (I know; I wrote one.)

If to us God is nothing more than a scientific hypothesis invoked to explain planetary orbits, or the rise of life on Earth, or the beginning of the Big Bang, then we are guilty of believing in the God of the Gaps. And we hold our religion hostage to new advances in science that may close those gaps.

Besides, that image of God is far removed from the God whom we experience every day in prayer and contemplation. And far removed from the God who came to Earth to save us from our sins.

What sort of God would these images give us? God as nothing but Prime Mover, who starts things off but then abandons us? What do you call a Father like that? God is no deadbeat dad.

Nor is he the kind of Father who would let us think we were living our own lives, but secretly -- without our knowledge -- pulls strings to make life "easier" for us; use his influence to get us into college, arrange for us to meet the love of our lives, in general never let us grow and try and stumble and try again. Any parent knows, as any teacher knows, the hardest part is knowing when to keep your mouth shut.

God is not only the Father of Jesus. In Jesus we have become co-heirs to creation -- I am quoting St. Paul again -- and as the letter to Hebrews says, to be raised and taught as such. He is, as our oldest prayer says, our Father.

God is a Father who gives life to the Universe, yes, but who watches as he allows it to grow and, indeed, to evolve. Yes, evolve; as Pope John Paul himself has stated, evolution is more than just a theory, it's an observation. The universe does evolve, and life on Earth does evolve, according to rules that we can begin to understand, rules that reveal the personality of the rule giver.

In creation, I see a creator who loves to produce amazing complexity from the interplay of a few simple rules. I see a creator who works with great economy, wasting nothing, ignoring nothing. And I see a creator who values highly elegance and beauty. There have been, I'd guess, a hundred thousand images returned by the Hubble Space

Telescope; I don't know of a single one that's ugly.

My religious faith does not control or directly assist the day to day details of my scientific work. I cannot lay on hands to stop my computer from crashing, or open the Bible to a random page and find the solution to a differential equation. Nor does my science direct me to an explanation of the mysteries of my faith, to define scientifically the true presence in the Eucharist or to explicate definitively on the nature of the Trinity. But my science helps me get used to the style of my God, to search out explanations that are beautiful and elegant. And my faith reminds me that my study of creation must be based not on dreams of power or fame, but on love.

God the Father allows his universe to evolve according to the rules He has set up. But he is a good Father, always attentive to each of His children. He does intervene; not too much; but when we do need Him. And when we ask. He likes to be asked.

It's a mystery that no theology can predict, no science can account for. We study the world for the love of it. And love makes the world go round.

(Editor: Brother Consolmagno was an essayist at the ITEST conference in 2007-- "Astronomy, Cosmology Breakthroughs and the God Question" His talk, Planetary Science Breakthroughs and the God Question, evoked much discussion among the participants and other essayists. To read an abstract and overview of the proceedings go to the ITEST web site at www.ITEST-faithscienc.org then click on Media and books.)

"What do I see in Creation, in Astronomy? First of all, beauty. Beauty is big to this God. Beauty is not something that happens by accident. Beauty is something that is there by design

There are other different ways in which God could have created the universe. This is the way that God chose to create: through principles that involve change and relationship...

Stars don't just occur in a vacuum. These are the connections I can make to the personality of the Incarnate representative whom I can read about in my book: a God who loved to tell stories; a God who is big into relationships; a God who loved beauty and wept at ugliness."

From page 146 in Astronomy, Cosmology Breakthroughs and the God Question.

The Incoherence of the Multiverse Notion

by Thomas P. Sheahen

Popularized accounts of science have lately been giving credence to the idea of the *Multiverse*, in which there are an infinite number of other universes “out there,” which are totally unobservable from our own universe.

The multiverse notion is a rather recent invention; before the discovery of the *anthropic coincidences* associated with our own universe, there was no particular reason to think of other universes. Now there is a motivating factor: we now realize that the initial conditions of our universe are incredibly fine-tuned; accurate to one part in an incomprehensively large number. If it were not so, life as we know it could not exist, and we wouldn't be here to discuss it. Many physicists who have taken the trouble to think through the implications of this fine-tuning find that it points to our universe having been deliberately created by a transcendent God.

In opposition to such a conclusion, belief in a multiverse permits the assertion that our very precisely-tuned universe exists just by chance alone. That gets around the disquieting implication of God. Hypothesizing a multiverse also has the convenient feature that it is impossible to *disprove* something guaranteed to be unobservable.

The foremost complaint against the multiverse has been that it is an obvious violation of the scientific canon known as *Ockham's Razor*: always choose the simplest theory that explains the observable data. Phrased another way: don't festoon your theory with things that are unobservable-in-principle.

When you go beyond the boundaries of science, you have stopped doing science and are thinking in some other domain. Religion is one such example, and it freely recognizes that it deals with an unobservable God – although religious people state that things which *are* observable point the way to God. For some who are antagonistic to the concept of God, *any* other explanation is preferable, and so they grasp at an alternative such as the multiverse. It generally escapes recognition that *belief* in a multiverse is a form of religion, too.

Imagining Infinity

Believing in an infinite number of universes is made eas-

ier by not understanding the mathematical concept of infinity. One commonplace image is just “a number too big to count,” but that's incorrect. Long ago mathematicians gave that number the whimsical name “kiglywig,” and designated it by an X with little circles at the end of all 4 branches. Another conceptual misunderstanding of infinity is typified by the expression “to infinity and beyond” from the character Buzz Lightyear in the cartoon movie *Toy Story*. You can't go beyond infinity.

In fact, you can't even get there. It just keeps receding. No matter how far you go, there is always farther to go, indeed an infinite distance farther.

In mathematics, we often deal with the concept of limits, where we imagine shrinking down from a small finite increment to an *infinitesimal*, and that is used to define a finite *derivative*. Likewise, we can handle the concept of a sum over an infinite number of such infinitesimals (*integration*), which yields a finite number for the *integral*. However, nobody has ever actually done an infinite calculation; every calculation ever done is finite. Even the biggest computers recognize when to stop calculating and present an answer which is accurate enough. It is only when *reasoning* about mathematical formulas that we freely use the symbol for infinity – it *never* enters into a numerical calculation. Indeed, if a computer program is poorly written and allows registers to overflow as a computation proceeded toward infinity, it would wipe out everything else, just like a virus.

As for the real universe, that is finite. Astronomers realized long ago that if there *were* an infinite number of stars, the night sky would be as brightly illuminated as the daytime. The Hubble Space Telescope's famous *deep field image* displayed an uncountable *but finite* number of stars. We estimate that there are about a hundred billion (10^{11}) galaxies, each containing about 10^{11} stars, but that's still a finite number – and it's nowhere near infinity. In fact, no number, however large, is anywhere near infinity.

Pure Chance

The notion of the multiverse asserts that there are an in-

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finite number of parallel universes (or consecutive universes), so that everything imaginable actually comes true someplace/ sometime or other. With a multiverse, the very fine-tuning needed for the anthropic coincidences present in our universe are said to be the product of sheer chance alone. Countless other universes didn't have the right combination of features to enable sentient life. Ours is the one where all the special numerical ratios worked out fine. That we are here to actually experience it is just one aspect of random chance.

Just as a calibration point, keep in mind that the probability of our universe happening completely by chance is one part in $10^{(10^{123})}$, a figure known as "the Penrose number." Meanwhile, there are only around 10^{88} particles in the known universe, which is closer to $10^{(10^2)}$; so there is a huge gulf that makes it impossible even to write down all the zeroes in $10^{(10^{123})}$. Nevertheless, these are all finite numbers.

It bears mentioning that if there *are* an infinite number of universes, then within that scope there are an infinite number of universes just like ours. Everything imaginable occurs in not just *some* universe, but in an infinite number of them. That's a consequence of the meaning of the mathematical term "infinite."

In his 2003 book *Modern Physics and Ancient Faith*, Stephen Barr wrote about one type of multiverse (p. 250):

"In the many-worlds interpretation, it is an inescapable fact that reality is infinitely subdivided, and that each human being exists in not one, or even a few, but in an infinite number of copies, with infinitely various life experiences. In some branches of reality you are reading this page, in other branches you may be lying on a beach somewhere, or sleeping in your bed, or dead."

Features of Assorted Universes

What can we say about such a collection? Well, I enjoy noting that in some of those universes, Elvis is still singing in Memphis and the Washington Capitals actually win the Stanley Cup. It's fair to say that the multiverse notion doesn't pass the giggle test.

But there's more than just giggles to think about here. Absolutely everything you can imagine has to come true someplace, and *you* are replicated again and again, even

down to the last detail of hairs on your arms. "Again and again" isn't really the right expression, because there are an infinite number of you – and an infinite number of me, too.

At the risk of being indelicate, I point out that in some of those universes, *you* are *my* sex-slave, completely committed to satisfying my every debauched whim, for your entire life. Of course, I prefer not to think about the converse.

The catalog of anomalous universes goes on and on, far beyond my ability to type in a lifetime (which is below the mere terabyte range). There are some very ugly universes: for example, where Hitler actually wins World War II, or Stalin takes over America, or mankind wipes itself out in a nuclear Armageddon, or a nearby star blows up and destroys all life. And it's not just a few such universes; there are an infinite number of every imaginable terrible universe. Sorry, but that's the meaning of the mathematical term "infinite."

Among those who prefer to believe in the multiverse rather than believe in God, some point to the Holocaust, and say that a loving God couldn't possibly allow such a thing, so therefore God must not exist. However, they fail to note that the conditions associated with the non-God multiverse guarantees countless Holocausts, and all the universes where Hitler wins WW2 will contain *successful* Holocausts. Joseph Stalin notoriously said "one man's death is a tragedy; a million deaths is a statistic." Stalin knew that humans are simply unable to deal with numbers beyond some point. The task of contemplating an infinite number of Holocausts overwhelms the mind – and hence nobody does it.

And by the way, the multiverse must be a very gloomy thought for Christians, too, because Jesus Christ has to suffer and die an infinite number of times.

The Unthinkable

Two decades ago, in *The Fire in the Equations* (a book that gave popular explanations of various speculative physics concepts) Kitty Ferguson discussed the testing requirement that scientific theories be falsifiable (p. 44). Some of what she said bears on the multiverse notion: "In fact a theory with no possibility of falsification isn't considered a very strong theory." And "But if a theory were

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to distort our perception of reality in a hidden way, in a way which skewed the fairness of the test itself, then admittedly we would have a problem. Do some theories do this?" The multiverse certainly has this problem, because of its necessary consequences.

Now let's go back and focus on my glib statement "I prefer not to think about the converse." Actually, I totally *refuse* to think about it.

It is not at all difficult for each of us to imagine sufficiently horrible outcomes which we cannot accept under any circumstances. We say it can't possibly actually happen; surely it will be forbidden by some cosmic principle, whatever. Everyone refuses to even think about certain awful conditions which are possible in principle and will **necessarily** be realized in an infinity of universes.

It is this refusal which makes the concept of the multiverse *incoherent*. No human being can tolerate its consequences. Truly zero people are willing to follow the concept of a multiverse to its logical conclusion. Even the most devout atheist must admit that a multiverse is too horrible to imagine, and emphatically *not* a suitable explanation for the universe we live in.

Alternatives

Proponents of the multiverse concept would probably like to reduce their hypothesized number of universes to something finite, somewhere around the Penrose number [$10^{(10^{123})}$]. That would put our own universe within reach of probability.

The various avenues of speculative physics-theorizing that serve this purpose exploit the enormous flexibility of *String Theory*. This is treated in much more detail within Spitzer's book *New Proofs for the Existence of God*, in a chapter (appendix?) known as the *Postscript: Inflationary Cosmology and the String Multiverse*.

String Theory is notorious for having very few constraints, and countless versions of String Theory are possible. Starting from such (plausible) concepts as *vacuum energy* and *inflation*, there are about 10^{500} available choices. This enables one to develop the imaginative conjecture of the *Landscape*. Therein, it is possible for a new universe to begin by pinching off a tiny region of space-time, which undergoes a big-bang and inflates, and this process continues indefinitely. There is sort of a "froth" of new

universes constantly bubbling up.

It is worth mentioning that 10^{500} is still only $10^{10^{2.7}}$, which is a really tiny number compared to $10^{10^{123}}$. In the *Postscript* we read "... 10^{500} universes with different laws and constants *may not be enough* for anthropic explanation of the fine-tuning of the universe in which we live. ... The cumulative effect of all of these fine-tunings significantly erodes the probabilistic resources inherent in the landscape." Furthermore, each of those bubble universes has to have its own initial conditions very finely tuned. No advantage is gained if fine-tuning is still required.

Following this narrative, one soon arrives at the concept of *eternal inflation*; that is, the process must go on forever – which requires the time dimension to be infinite both forward and backward. This is essentially the same point where Hume, Nietzsche and other enlightenment writers wound up, although they had only Newtonian classical mechanics, not *string theory*, to aid their imaginations. We're back to infinity once more.

Again quoting the *Postscript*, the prominent string theorist Alexander Vilenkin put it this way: "...in the worldview that has emerged from eternal inflation, our Earth and our civilization are anything but unique. Instead, countless *identical* civilizations are scattered in the infinite expanse of the cosmos." Indeed, clones of each of us are endlessly reproduced throughout the inflationary universe, for "the existence of clones is ... an inevitable consequence of the theory."

And of course that brings with it all the unpleasanties mentioned above.

Conclusion

It finally comes back to the task of explaining our own universe, comprised of "only" about 10^{88} particles. A scientist is always free to abandon the quest, on the grounds that the answer lies beyond the boundaries of science. But for most, that's an unsatisfying place to stop. Many scientists have concluded that the evidence within our universe points to a creator who transcends the universe. That is the most reasonable conclusion to draw. Those who choose the alternate hypothesis of a multiverse haven't thought carefully about its implications, and are following an intellectual path that is incoherent.

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The Power Of God's Purpose

by Dr. Robert A. Brungs, SJ, (2006)

(Part Two of an essay written as a response to the assertions of "the new atheists" like Dawkins, Harris, Hitchens and others who deny the existence of "God" in this "purposeless" universe. Part One was published in the Fall issue of the Bulletin Vol. 44 #4)

God, the purpose of the universe

What was God's purpose in creating the universe? I do not say "if God created the universe." God wanted the total, unrestrained love of all his creatures. God wanted to be united with each and every creature – even those that are not alive at the present time. St. Paul said as much in Romans when he remarked that the "whole creation is eagerly waiting for God to reveal his children but creation still retains the hope of being freed, like us, from its slavery to decadence, to enjoy the same freedom and glory as the children of God." That is God's purpose: to bring us all to a recognition of his love, non-living creatures perhaps included.

Does that purpose of God make us "comfortable"? Hardly! Or at least it shouldn't. God is the most rambunctious Being in existence. He has no scruples and knows no hesitation in upsetting the most comfortable of us. Some he calls from a life of ease to experience a life of pain and suffering -- and to experience the pain quite willingly. He knows no limit in turning people to the love of him in circumstances of wealth or poverty. Others he upsets with painful feelings of inadequacy or lack of love. But, slowly or suddenly, he turns the heart of every creature to himself – even if only to be rebuffed. In doing all this, he inserts himself into the life of every living creature, whether he is welcome or not. He tends to be unrelenting in the way He persistently interrupts the steady pace of our lives from time to time – without even asking our permission.

He sent his only-begotten Son into the world to live, die and rise from the dead to bring the hearts of all to himself. And his Son became a point of controversy, denial,

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persecution and even death in the world. The one who said “Love one another as I have loved you” also drew the hatred of many. But he preached God’s purpose: “to bring his creatures to a total love of God.”

What further can we say about God’s purpose? God’s wants us to love him totally. He wants us to be as totally out of control in our love for him as he is “out of control” in his love for us and for all of creation. Is being “out of control” comfortable? Hardly! All human beings struggle mightily to be in control. Many even struggle to be in control of their environment and other human beings. Some even want to be in control on a broader stage. Living out of control is not comfortable, whether we are so told by “our television preacher” or anyone else. But we are to live toward God “out of our own control.” God wills us to be “out of control” in our love for him and for each other. We, from our side, always try to domesticate God, to control him for our own ends. We make it a contest of wills -- a contest of conflicting purpose. But we know instinctively that, in the end, God is the stronger. His purpose will triumph and we will end up being blessed.

One thing about the Christian God is that, even though he has appeared among us as a man, he is surrounded by mystery, by our not-knowing. He is simply beyond us, completely and totally beyond us. Remember that Moses at Sinai was allowed to see only God’s “hindquarters.” We will have to wait until “we know as we are known” to get more than a glimpse of God as he is. Only then will his “being out of control” in his love for us begin to “make sense” to us. He wants – it is his purpose -- to be united with us in love. It is his purpose that we are to be in love with each other and, fulfilled in him, to be in love eschatologically. It is his purpose; it is not our merit that brings this about.

Human love, as we know it now, will be transformed into full unity. I believe it absolutely. Do I know absolutely what makes up the cosmos and what its final state will be? No, of course not. But I believe that learning more about my personal relationship with God, as well as the relationships between humans and between humans and things, is both a scientific imperative as well as a human necessity. The only world we can live in is the world that truly exists. We need both science and faith to live in that world, the Enlightenment’s separation of faith and reason notwithstanding. To live in a world that “is not” is indeed an act of intellectual blindness.

But God’s purpose will finally win out. Our puny wills will gradually give way before God’s rambunctious love. God will not allow himself to be domesticated. Of that we can be certain. When God’s will wins out, what a sense of joy will run through all of this enormous universe! It will not be “uncaring and ungraspable.” It may have seemed to be that way to us in the twenty-first century. It won’t seem to be that way, perhaps, in the thirty-first century. We will know more, all things being equal and barring a total catastrophe like the demise of the human race. The more we know, the more we truly learn and the more God will shine through his creation. The more his totally uncontrolled love will come to dominate us, the more will creation shout for joy because of its continuing liberation from decay. God’s purpose will triumph. That will become our power and glory. That is the power of God’s purpose!

We owe the “evolutionists” a debt of gratitude. They have concentrated our attention on the fact that we are becoming – we are living toward the future. The face of the believer is always turned to the future – to the purpose of the Creator. That is where our emphasis ought to be. We cannot forget that *we are*, but we are also living toward our fullness. We haven’t achieved it; we are merely moving toward it. Mankind does not have a merely fixed being, never advancing toward another state. That advance seems to be the direct purpose of the Creator. The evolutionists are not the first to tell us about “evolution.” As far back as the early writings of the Jewish Scriptures, it was abundantly clear that we are advancing in the knowledge and love of God. We can read it in the writings of, say, St. Gregory of Nyssa. And as we have more and more aligned ourselves with the will and purpose of God, we have more and more come simply to accept that advance without even advertent to it. It is now in our possession.

At present, above all, it would seem as if humankind “has a will and purpose of its own” which simply is not worried whether it is aligned with God’s purpose for creation. I think that is an invalid view of modern humanity. From time to time, rebellion against God and his purposes may arise. I am convinced, however, that even seeming rebellion can be used by God to “humanize creation.” I simply assume that God will not lose his creation to man’s perverted will. God’s purpose, the reason for us all, will bring our will and purpose into alignment with his. And

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the power of God's purpose in the final analysis will bring us rejoicing into bliss.

In the *Summa Theologiae*, Thomas Aquinas answers the question whether there will be animals in heaven. After dealing with each of the points brought forth in support of the notion that there will not be animals there, Thomas says the God will not lose any of the beauty that he has created. What is more beautiful than a human being? If God may be willing to save animals because of their beauty, and if he is willing to save us because we are made in his image and likeness, he will be willing to save the rest of the cosmos, the rest of his creation. I don't think it is his purpose to lose anything he has created and blessed. I doubt that it is his purpose to lose his creation to angel, devil, men and women or anything. I believe that, if one wishes to know true power, he or she need only to look to God's will and purpose.

It seems strange to contemplate a purposeless, uncaring, cold, hostile, and even vertiginous, universe which has produced as its highest "product" a purposive creature we call a human being. Could it be that there is some truth in the Bible's description of mankind? Can it be that it was and is God's purpose to create mankind "in his own image and likeness", scientific materialists notwithstanding? Can it be that the purposive creature called man knows no activity that is not governed by a human purpose, even if that purpose is to be non-purposeful? So, every action

is governed by a purpose, and every purpose is aimed at good or evil.

God's purpose is the good of humankind. God seems to want more than anything else to be united to humanity in an undying and ever deepening love affair. And together with human beings, God will save and protect the cosmos he has created. Women and men, inebriated with the love of God, then, will share themselves with every other human and through human beings with every other creature. In the end, God's purpose will be fulfilled in love. In the words of Hippolytus of Rome written about 1700 years ago:

O crucified One, thou leader of the mystical dances!
O this spiritual wedding feast! O this divine Pasch
that passes from heaven to earth and rises up again to
heaven! O this new feast of all things! O cosmic festal
gathering! O joy of the universe, honour, ecstasy,
exquisite delight by which dark death is destroyed,
life returns to all and the gates of heaven are opened.
God appeared as a man and man rose up as God when
he shattered the gates of Hell and burst the iron bolts
thereof and the people that were in the depths arise
from the dead and announce to all the hosts of heaven:
"The thronging choir from earth is coming home" (2)

We are coming home. That is God's purpose.

Reference: (2) Hippolytus of Rome, *De Pascha Homilia*, 6, PG, 59, 743-5.

"Science Finds, Industry Applies, Man Conforms"

Summer, 2005 in *Written in our Flesh: Eyes Toward Jerusalem*.

pp. 252-253 Section titled "Embryonic Stem Cells."

"We are not made for this world in the same sense that we are made for everlasting life and love in God. At the same time, However, we are made for this world; it is our home; it is the arena in which we live and love God; it is the stage on which we play out the drama of our existence. But it is more than that, St. Paul tells us (Romans 8) that creation itself (including obviously the physical world) "still retains the hope of being freed, like us, from its slavery to decadence, to enjoy the same freedom and glory as the children of God.

"But we are of the earth and from the earth and we will always be of the earth. We are always caught in the web of history. We are at the same time (and for the same reason) enmeshed in the paradox of being earth-fleeing and earth-seeking creatures. The earth is ours to see, to understand as best we can and to love. That is the obligation placed on each of us. It is also our obligation continually to relate that seeing, understanding and loving to the will of God and to his service; that is our burden and our glory."

DVD: The Reason Series

What science says about God

Produced by the Magis Center of Reason and Faith, Irvine CA 92612

On-line store: www.magisreasonfaith.org

Reviewed by Ralph Olliges and Thomas Sheahen

The Reason Series is a set of five DVDs that are intended to show high school students how to apply critical reasoning to important questions that link faith and science. These videos convey their message in a better way than conventional printed books. The style of presentations feature college students discussing matters informally, and thus automatically encourage student viewers to initiate similar discussions with their peers.

Each video is ½ hour long, and covers one major theme. That makes a convenient way to initiate a classroom discussion which focuses on that particular theme. Alternately, a student can view each video and then write a commentary that further develops his/her own questions.



The cast is made up of four collegians: Joe, a freshman who asks a series of questions; Alana, a philosophy graduate student who brings in the careful reasoning; Dan, a physics graduate student who knows what physics really says about the universe, the earth, etc.; and Tyler, the roommate of Joe who is never on-stage but provides a videotaped blog for each episode. Tyler is a devout atheist, and his strident assertions against religion provide the incentive for Joe's earnest questioning.

Just about everybody knows a Tyler, and many high school students have already heard Tyler's views, perhaps even as early as junior high school. It is very plausible for a student to identify with Joe (the questioner); and the two more advanced students who respond are much more relatable than a professor (an authority figure).

The venues are variously an observatory, an electronics lab, a pool table, an expensive automobile, etc. That informal ambiance adds appeal, diminishes the sense of

“classroom,” and removes any pressure to give the teacher the “right” answer. That relaxed format works.

The topics of the sequential videos are:

Episode 1 – The Roommate and Science

After introducing the characters, the first point made is that science cannot disprove God. It is a false choice to have to choose between God and Science.

The viewer learns that the scientific method has limits.

- Scientific method cannot be used to *disprove* anything.
- Science cannot deal with values.
- God exists outside of our own universe.

Something does not come from *nothing*. Our universe came from something – it had a start; a beginning. There is evidence from science that points toward the existence of God. *How* God created us is deferred for the time being.

Episode 2 – Is God Real?

Visiting the Mount Wilson observatory, the students discuss how the *Big Bang* notion developed: Starting with Einstein's equations, Georges Lemaitre found a solution that began at a point; subsequently, the observations of Edwin Hubble showed that the universe is expanding. Galaxies are moving apart. The universe has a scale to its expansion. If you “ran the film” in reverse, you would be moving back toward a singular point. Thus, the universe had a beginning.

For about three quarters of a century, scientists have agreed that our universe started with the *Big Bang*. Initially there was neither time nor space; *nothing* was there. Our perception is that God is the creator of that beginning.

Physics and philosophy come together in a discussion of the basic conditions governing the universe. Dan

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and Alana explain to Joe that the BGV theorem (2003) proved this very general principle: for *any* universe where the average rate of expansion is greater than zero, it *must* have had a beginning. The universe might go *forward* without limit, but could not go back in time forever. That requirement takes away the most common rationale for the atheistic perception.

The requirement of a beginning indicates that the universe had to have a creator, *transcendent* to the universe; which we identify with God.

Episode 3 – Is the Universe Random and Meaningful?

This video talks about a cosmic accident vs. an intelligent creator. Two central concepts need to be explained by Dan the physics major: *entropy* and *fine-tuning*.

Entropy is a measure of disorder; low entropy (organized state) is contrasted to high entropy (disorganized state). A pool table with balls scattered around conveys this image well. Our universe began in a state of low entropy, for a very good reason, and evolves continuously toward a state of higher entropy.

Fine-tuning expresses the incredible precision of the universe we live in. There are 20 numerical conditions (ratios of numbers fixed from the very beginning) that govern our universe. If any of them were different by a tiny amount, then we would not exist. These are known collectively as the *anthropic coincidences*. The probability of them all happening by chance is 1 part in $10^{(10^{123})}$, a number so big that it is impossible for all the zeroes to ever be written out.

The incredible precision that makes intelligent life possible is far more finely tuned than a number obtained by multiplying the number of galaxies (100 billion, 10^{11}) times the number of stars in a galaxy (10^{11}). The most *reasonable* and *responsible* conclusion is that it was accomplished by a super-intelligence, which is God.

Episode 4 – Does the Bible Conflict with Science?

Here the discussion moves away from the heavy physics into more familiar territory. The bible is not about science, but rather about theology. Alana explains the reason for theology --- God strives to reveal His love to the world. Love is completely good. It seeks to bring good to every-

one around you. Love that is unconditional is perfect. It is not an accident. God wants to share His unconditional love with us. Jesus means “God is with us.”

Conditional love can be painful. We are reminded of words going back to Plato, “Evil is the absence of love.” Evil comes from rejecting love.

There is a basic distinction which assures that the Bible will not conflict with science. The bible is about theology; the writers are trying to answer theological questions. God provides theological concepts to people so that they may understand. It is crucial to read the bible as theology and not confuse it with science.

Science explains *how* the universe was created. Theology and the Bible explain *why* it was created.

Episode 5 – Does the Bible Conflict with Evolution?

By this point the once-imperious Tyler is more sober in his video blog. Alana and Dan agree that God made science, and He does not need to be afraid of it. The bible is theology.

Evolution is science, and there is good evidence for evolution, including:

- a) The fossil records
- b) Anatomical similarities – species may be connected
- c) Geographical distribution of species – the further you go away, the more different the species are (e.g., islands contain species that evolve on their own).
- d) Evolution applies to only the material world. Science does not explain the spirit which survives death.

The spirit is made in God’s image. Science cannot explain souls. The topic of *near-death experiences* provides some food for thought about the soul. 18% have near death experiences; 82% do not. Remarkably, people with near death experiences are no longer afraid of dying.

The episode concludes by positing that we have a purpose which is both real and eternal.

Throughout *The Reason Series*, each session takes the

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questions posed by Joe seriously. The responses by Alana and Dan remain respectful of the anti-religious viewpoint, even though Tyler's videos are hostile and derisive. Joe the freshman never ridiculed Tyler's scornful attitude. That respect will elicit a positive reaction from high school students.

It is fair to wonder about what age level this series is best suited. We think sophomores in high school are ready for this content. Indeed, waiting until senior year (when a course in physics is well along) may be too late! Owing to input from peers, students often have their minds made up by that time, and may no longer be willing to pay attention

to anything perceived as a "religion lesson."

A tenth-grader has the ability to reason, and these questions are urgent enough to demand answers. Even though such a student likely won't grasp all the science (it was never asserted that Joe the freshman fully understood the physics), the mere fact that *someone* has answers and confidently speaks up on behalf of the Christian viewpoint is very encouraging. That in turn reinforces trust in the wisdom and guidance of church leaders.

We highly recommend *The Reason Series* to high school teachers of science and religion.

Faith, Science and Human Sexuality: What We Want our Kids to Know

By Dr. Sebastian P. Mahfood, O.P., Sr. Carla Mae Streeter, O.P., Dr. Thomas P. Sheahen

ITEST is developing a series of faith/science modules concerning human sexuality. The modules are designed for use in Catholic and Christian private schools or by home-schoolers. Here we are inviting you to share in that development activity.

Rationale

A very important aspect of education in the life sciences pertains to the topic of human sexuality. Committed Christians believe that our sexuality is sacramental, an outward sign of the inward grace of participating in the creative power of God. Unfortunately, public school "health" classes fail to convey anything about how our sexuality as humans is a spiritual function, engaging our wonder, intelligence and freedom. Indeed, the government-sponsored curriculum originated by Planned Parenthood teaches that human sexuality is a purely material, even mechanical, process in which any form of sexual expression is permitted. We created these modules because we do not want Planned Parenthood to be our children's primary educator in regards to their sexuality.

Thomas Aquinas, in contrast, taught that the joy of chaste sexual pleasure was part of a rightly ordered heart. He taught that when a person turned to God, one's entire person was grasped by this love, thus ordering the passions (emotions) toward good choices in line with that love. Many counselors today who work within a world-view of faith are in agreement with Aquinas. Chaste sexual activity should bring joy and comfort to the married couple.

Description

This curriculum supplement, entitled "Faith, Science and

Sexuality," is modeled along the lines of the successful elementary-school faith/science series EWDG (*Exploring the World, Discovering God*), which are posted at www.creationlens.org. A "module" may occupy a week or more, at the teacher's discretion. The new modules on human sexuality are currently available to our partners during this development phase at www.faithscience.org/fss.html

Our human sexuality lessons bring out the unity between faith and science. Structured in the same side-by-side format as the EWDG lessons, the lessons show quite clearly that God is not only the author of human sexuality, but the nurturer of a loving and responsible relationship. The children learn that via the human reproductive system, we share God's creative power when we procreate a new human being. Our goal is to convey a set of deep-seated religious principles that guide our young people to a good understanding of sexual energy and how to use it. In sharp contrast to what Planned Parenthood has promulgated, our human sexuality modules strive to achieve an outlook that is totally *counter-cultural*.

The eleven modules currently on-line begin with the kindergarten student and progress one per year (with the exception of two per year in the 4th and 5th grades) through 8th grade.

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Concerning science, we endeavor to

- introduce the students to the way living things exist in nature,
- introduce the notion of the living cell and how the body renews it,
- introduce the notion of how the cells grow in a healthy way when the life force moves between cells with nourishment and removal of toxins,
- introduce the concept of living things not only renewing their cells but creating whole new creatures like themselves,
- explain how reproduction can only occur through the process of offering and accepting, giving and receiving,
- initiate and explain the process by which humans become physically ready to produce new life through the changes that take place in our bodies as we grow,
- understand that bodily changes are a standard part of the growth process and maturation,
- understand how new human life is generated,
- understand human feeling and emotion and the influence they have on sexual activity,
- explain healthy and unhealthy forms of sexual expression, and
- realize the role of individual choice in the use of sexual energy.

Concerning faith, we endeavor to

- introduce the students to God's self-giving love as the source of the natural laws that make life possible,
- review the nature of God as the source of all forms of natural life,
- help the students understand the meaning and need of community in nourishing their partnership with God both as an individual and as a member of the bigger human family,
- introduce the understanding that God wants to work in partnership with his creatures to continue the work of creation,
- explain that human reproduction is imitating what God does when God is creating,
- understand that human sexuality has a spiritual as well as physical dimension,
- be amazed and get a beginning understanding of the complex and interactive functioning of the human

body in its creation,

- understand that healthy sexual activity is always a sign of God's self-giving Love in partnership with the parents who manifest His creative power in offering and in accepting love from each other,
- become aware of how God the Father, through the Holy Spirit, works through emotions to help us make good choices,
- understand the value of appropriate sexual expression in conjunction with a relationship with God, and
- understand that the truly free person directs the power of sexual energy worthy of a dwelling place for the Divine which is the human person.

These are quite hefty goals for both the science and the faith areas over the period of a child's cognitive, emotional and sexual development -- even if each was treated separately.

The ITEST series of modules leverages the faith and the science discussions so that they rely on one another. The goals in the above lists match up. Here is one example: In first grade when a child is studying (on the science side) the notion of the living cell and how the body renews it, he or she is also learning (on the faith side) the nature of God as the source of all forms of natural life. The expected outcomes for that 1st grade module are that the students will have an understanding of the basic building blocks of life. Children will be able to explain that when a living thing takes in food, it grows; explain that God's love helps natural growth to happen; and explain that sharing ourselves with others is a way to grow spiritually. They reach these outcomes by engaging in an activity.

That same approach and structure underlies each module for consecutive grades.

Next Step

We are launching a Massive Open Online Course (MOOC) beginning on Ash Wednesday (March 5, 2014), using these modules as our content. The course will be taught on the servers of Edvance360's learning management system. Parents and school teachers will be invited to participate in the course for free, engaging one another in conversation over the content contained in the modules. With nine grade levels, the length of the MOOC will be exactly 6 weeks, covering the whole of Lent by clustering modules K-1 into week one, 2-3 into week two, 4 as week three, 5 as week four, 6-7 as week 5, and 8 as week six. We hope you will join us for the course. Registrations may be made at <http://fss.eventzilla.net>.