



# Institute For Theological Encounter With Science and Technology

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## Overcoming Indifference

In his Lenten message for 2015, Pope Francis addressed the problem of “the globalization of indifference.” It’s an easy fault to fall into, because the news every day is filled with stories of human suffering, which seem impossible to do anything about, so a common response is to just tune the whole thing out. The term for this is “compassion fatigue.” Pope Francis writes, “Indifference to our neighbor and to God also represents a real temptation for us Christians” and goes on to suggest that Lent is a time to re-focus and overcome our indifference.

Fortunately, there are times and places where people overcome the temptation to indifference. Perhaps the best example of all is the huge crowd who gathered in Washington DC on January 22 to protest abortion. While most of America goes about daily life, participants in the March for Life are making the statement that we are *not* indifferent to the sufferings of unborn babies. Now in its 42nd year, the annual March for Life has grown to a half-million people.

The major national media are *beyond* indifferent, blocking out any coverage. Advertisers know that showing even 2 seconds of a moving throng will cause the viewer to change the channel; the networks conform to the safest path to profitability: indifference.

The most striking thing about actually being there was seeing how *young* the crowd was. Everywhere you looked was a sea of “millennials.” For decades the marching chant has been “Roe V Wade has got to go!” but this year the loudest repeated chant was “We ... Are ... The Pro-Life Generation.” Signs read “One third of my generation has been killed by abortion.” Many of our young Christians understand how the plague of abortion is destroying us, and they are not about to be indifferent. Because of them, the tide is gradually turning against abortion.

Pope Francis urges parishes and communities to be “A body which acknowledges and cares for its weakest, poorest and most insignificant members” He says “How greatly I desire that all those places where the Church is present, especially our parishes and our communities, may become islands of mercy in the midst of the sea of indifference!”

Those islands of mercy are springing up everywhere: crisis-pregnancy centers, in both big cities and rural communities; sidewalk-counselors who invite women approaching abortion clinics to turn away and accept *real* help; maternity homes sponsored by churches; groups praying the rosary at abortion clinics, providing the only funeral that some children ever get.

Many tiny islands remain unseen, slightly below the surface: the high school girl who convinces her pregnant friend that it *is* workable to choose life; the parents whose example of Christian marriage convinces their children that abstinence and fidelity lead to the best life. Every instance begins when someone makes the decision “I will not be indifferent.” In Pope Francis’ phrase, they have acquired “... a heart which is firm and merciful, attentive and generous, a heart which is not closed, indifferent or prey to the globalization of indifference.”

*Thomas P. Sheahan*  
Director, ITEST

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## Announcements

### Second Renewal Notices

Second Renewal Notices will go out soon. If you haven't renewed yet for calendar year 2015, we urge you to return your dues (\$75.00) individual; (\$125.) institutional; (\$25.) Students.

### Economic Justice Seminar Reminder

The Board of Directors has settled the dates for the workshop: **"Economic Justice in the 21st Century – Myth or Reality"** Save the dates October 23, 24th, Friday evening through Saturday afternoon for this traditional ITEST meeting at the Rigali Center in St. Louis. The cost of the workshop, including Saturday lunch and breaks, will be announced in the spring issue and also in the brochure we will distribute to ITEST members. There are hotels nearby where out-of-town participants may lodge at a discount for this meeting. Again, more detailed information will be forthcoming in the spring.

Three speakers accepted our invitation: Dr. Edward J. O'Boyle, economist and Senior Research Associate at the Mayo Research Institute will provide a commentary on the economic aspects of Pope Francis' *Evangelii Gaudium*. (See Parts I and II in the ITEST bulletin, Vol. 45, #'s 3 & 4.) Dr. Hermann Frieboes, Adjunct Professor at Holy Apostles College & Seminary also teaches at the University of Louisville. His paper, *From St. Paul to Pope Francis: 2000 years of Catholic Social Justice*, will provide "...an overarching view of the development of the social justice focus of the Catholic Church over the centuries." Dr. Martin Rafanan, Community Organizer, Fast Food Worker Movement and Co-Chair of the Workers Rights Board of Missouri Jobs with Justice, will connect economic issues with social justice by discussing the national issues of the relationship of the activities of low wage/fast food workers and local economies.

Each speaker will have 15-20 minutes to present the main points of the essay with discussion and questions

to follow. On Saturday afternoon, the speakers will form a panel for discussion of certain "neuralgic" points that may have arisen during the seminar. This format provides an opportunity for the presenters and the participants to address the different perspectives on economic justice and how those viewpoints either dispel or support the "myth" or "reality" of 21st century economic justice as experienced globally, nationally and locally. This should be a lively "encounter" among the participants of the seminar.

### Webinars with Father Robert Spitzer, SJ

The first two of three webinars led by Father Spitzer met with great success. Just in case you haven't had a chance to view and participate you still have an opportunity to sign up for Webinar III, March 11 from 3:30 – 5:00 pm Central Standard Time. The topic: **"Evolution, Christianity and Contemporary Science: Teaching Confluence instead of Conflict."** Father Spitzer, a dynamic speaker will keep you on the edge of your chairs throughout the presentation. There will be time also for you to type in questions which Father will address after the presentation. Recently we sent the URL or code to all members on the e-mail list to use in order to register "free of charge" <http://mp125118.cdn.mediaplatform.com/125118/wc/mp/4000/5592/5599/44517/Lobby/default.htm>

If we do not have your e-mail, we would appreciate hearing from you. We will not use your e-mail address except for ITEST business. We do not share our e-mail lists with anyone.

We will notify you via e-mail with a "clickable" URL to access the Webinar closer to the March 11 date. You may also view the first two webinars as webcasts using the same URL.



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## From Nothing to Cosmos: God and Science

Review of the DVD series

By Ralph Olliges, PhD and Thomas Sheahen, PhD

The four-DVD series: “*From Nothing to Cosmos: God and Science*” consists of lectures by Fr. Robert J. Spitzer, S.J. with various graphics or PowerPoint slides interspersed. In addition, a workbook accompanies the DVD series. The content is quite accurate from both scientific and theological viewpoints.

This work falls within the category of *Apologetics*. It is a simpler exposition of some concepts presented in the 2010 book “New Proofs for the Existence of God” by Fr. Robert J. Spitzer, S.J. At points within these DVDs, the viewer is pointed to chapters in that book for further details.

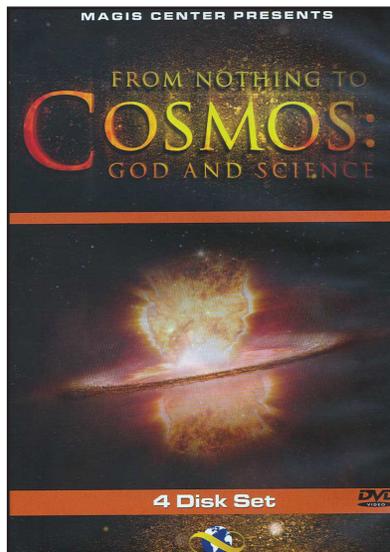
Over the four DVDs, Fr Spitzer shows that the most reasonable and responsible way to understand the universe is to accept that it was created by a transcendent, supernatural God. He draws on modern physics and cosmology to establish this point, focusing on three lines of evidence for a creator: (1) space-time geometry proofs, (2) considerations of order/disorder and entropy, and (3) fine-tuning of the constants of nature (the *anthropic coincidences*). He explains how the combination of these sets of evidence leads one to a Creator, God. The evidence is quite compelling, and the various “escape routes” taken by atheists all fail, because they are so utterly improbable and burdened with unnecessary contrived complexity.

Some parts of the series focus more on physics; whereas, other parts explore theological or frequently-asked pertinent questions. The series is appropriate for adults interested in both physics as well as theology, and is accessible to advanced, attentive high school students.

We recommend this set to everyone who strives to defend a contemporary understanding of God’s creation of our universe. Below are synopses of each episode.

### *Episode 1 –*

Science is about making observations and using the scientific method. Science is an inductive discipline,



open-ended. No scientist claims to know everything about everything in the universe. Moreover, it is much harder to disprove something than to prove something; thus, science cannot disprove the existence of a creator, God.

Conversely, we may ask, how can science give evidence for a creator? Answer: The universe we observe is expanding. Evidence exists within our universe that reveals a limit to past time. If science can show a beginning to physical reality, space and time, then there is no “prior time” in which there was “nothing.” Nothing is nothing (It is not empty space,

nor a vacuum). Therefore, the only thing that nothing can do is nothing. Therefore, something beyond physical reality had to move from nothing to something, and that was the beginning of the universe. We call that external transcendent creator, God.

Fr Georges Lemaitre originated the Big Bang Theory; to get to the modern universe, space and time stretch like a balloon, with galaxies moving apart as it expands, like dots on the surface. In 1929, Edwin Hubble observed that galaxies are moving apart ever faster, which confirmed

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### **Ralph H. Olliges**

Ralph H. Olliges is an ITEST Board Member and Associate Professor of Education at Webster University in Saint Louis. He coordinates the Masters of Educational Technology (M.E.T.), the Certificate in Online Teaching and Learning, and the Ed. S. in Technology Leadership. Dr Olliges possesses over thirty-three years of teaching experience in the classroom and online. His area of expertise deals with how to successfully integrate technology in the classroom. He teaches courses on educational technology in the classroom, databases in the classroom, building web sites for teachers, and the use of many different software packages in the classroom. He is a nationally recognized technological educator and researcher in the field of web-based and web-enhanced learning.

Lemaitre's theory. Hubble's observations convinced Einstein that the universe is expanding. Only more recently have we developed the picture the universe consists of three sources of mass energy: visible matter (4.6%), dark matter (23%), and dark energy (72.4%).

Fr. Spitzer concludes this first DVD by introducing the "space-time proof," based on three major scientific papers: (a) 1993 Borde & Vilenkin's Space-Time Geometry Proof, (b) 1999 Guth Modeling of Inflationary Universes Proof, and (c) 2003 Borde-Vilenkin-Guth (BVG) Proof. Either our universe or any imagined Multiverse that is expanding *must* have had a beginning in time; that conclusion is inescapable. An infinite past, a consecutive series of "bouncing" universes going on forever, is impossible.

#### Episode 2 –

In this second DVD, Fr Spitzer explains the six steps of the BVG proof, which has only one condition: that the average expansion rate be greater than zero. (It is hard to defeat a proof with only one condition.) The universe is expanding; therefore, it needs a beginning. There is an important distinction between the *recessional* velocity of galaxies and their *relative* velocity. The greater the *recessional* velocity, the slower the *relative* velocity. Running the clock in reverse, the *relative* velocities increase as the universe shrinks. Because of the upper limit of the speed of light, the elapsed (past) time is limited and finite.

Another set of evidence for a creator comes from entropy, the measure of disorganization. The universe began in a highly ordered state (low entropy) and moves only toward high entropy (disorganization) as time passes. Fr Spitzer then provides the five steps from entropy to the beginning of a universe and a Creator, God.

Fr Spitzer then lays out the argument based on fine-tuning: The anthropic coincidences involve "a highly, highly improbable condition of the universe necessary for the origination and development of life forms." At the outset (the Big Bang), twenty numerical constants of exquisitely fine-tuned values existed. If any one of the constants was off by just a little bit, then life would not be possible. The actual precision is astonishing. The probability of this happening by chance alone is about 1 part in  $10^{(10^{123})}$ , which is overwhelmingly larger than the number of particles in the universe (a mere  $10^{88}$ ). It is simply not reasonable and responsible to attribute this to chance. If no natural cause can be found to explain this,

then a supernatural Creator is highly probable. The only way out is to hypothesize the existence of countless other universes, known as the *Multiverse*.

#### Episode 3 –

This DVD explores the multiverse hypothesis, and shows that it doesn't provide any answers. All multiverses must have a beginning. The idea is that countless little "bubble universes" keep popping out and expanding. You would need greater than  $10^{(10^{123})}$  of them just to have a chance, *and* they could not bump into one another, *and* they are tightly constrained (fine-tuned) by even more precision than our single universe. The multiverse hypothesis obviously violates the scientific canon of *Ockham's Razor* (nature favors elegance).

There are those who object to a supernatural origin on other grounds. For example, Richard Dawkins stated that a designer must be more complex than what it designs, and more complexity is more improbable. Fr. Spitzer counters that God is not complex, but simple – a pure act of existence itself. The philosophers Aristotle, Thomas Aquinas and Bernard Lonergan all agreed that a creator must be an uncaused cause, the pure act of existing. There cannot be any restriction upon the pure act of existing. Complexity implies parts; parts imply restrictions. But an uncaused cause cannot have any restrictions. Therefore, an uncaused cause cannot have any parts (complexity). Dawkins' assertion about complexity is in error.

John Henry Newman introduced the concept of an "informal inference." Everything around us points to the informal inference that an intelligent Creator made the universe. That is the most reasonable and responsible conclusion to draw. A creator is the most probable of all explanations; you have to believe far more strange things to deny the existence of God.

In the latter portion of Episode 3, Fr. Spitzer turns to the topic of "near death experiences," which supply evidence for a transcendent soul that survives bodily death. The experiences he addresses are all reported in medical journals, and there is a remarkable similarity among the reports from many independent sources. None of this can be explained unless consciousness survives beyond bodily death. It is reasonable to believe in your own transcendence.

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Episode 4 –

This DVD continues the discussion of near death experiences, in which people believe they see their bodies from outside of themselves. Many times they are greeted by deceased relatives, by Jesus, or a white light. Physiological explanations simply don't explain any of this. For example, 80% of blind people (most blind from birth) see during clinical death.

Fr Spitzer then describes a trans-physical soul. The five transcendental desires are a perfect and unconditional truth, love, justice/goodness, beauty, and being. These all go back to Plato/Aristotle. Why do we have these desires? Why are we able to recognize *imperfect* varieties of these desires? Fr. Spitzer lays out the argument that the source of our awareness of each imperfection must connect us to a transcendent being, God; which means *you* are capable of transcendent activity.

After summarizing the collection of arguments, Fr. Spitzer raised the question “How can anyone remain an atheist?” He says that people do *not* become atheists for rational reasons, but because of personal and emotional causes, such as suffering, dislike of organized religions, etc. One cause is that people just don't want to be responsible to anything outside themselves; they would rather treat *themselves* as God. That's a choice, not a reason. Being responsible to yourself and being responsible to God fit together perfectly well.

Toward the end of episode 4, Fr Spitzer discusses whether the Bible and Science conflict. He references Pope Pius XII's encyclical, “*Divino Afflante Spiritu.*” Fr. Spitzer states that the purpose of the bible is to manifest the truth of salvation. This is distinctly different from presenting scientific facts. God intended to communicate to an audience through an author, none of whom were scientific in any way. Basically, the best rule comes down to: “let science be science and the bible be the bible.”

He then tackles evolution in the same manner. Many Christians are not opposed to evolution in any way. The church has been involved in science throughout history; notable clergymen include Copernicus, Mendel, Lemaitre, and many more. Fr. Spitzer references Pope Pius XII's encyclical, “*Humani Generis*” which states that Catholics can believe anything scientifically verified with respect to evolution, but cannot reduce the human to a purely physical entity, a mere bodily existence. Thus, only

denying existence of a soul is disallowed.

Finally, Fr Spitzer tackles the question of aliens. Because there are so many stars to begin with ( $10^{22}$ ), aliens can exist out there. Everyone is free to speculate about such creatures; Fr. Spitzer offers some thoughts about their possible need for salvation.

A criticism of the visual presentation: The great majority of the time, Fr. Spitzer is shown speaking and standing against a totally blue background, without even a floor. While Father Spitzer is a charismatic presenter, and his words clearly state his message, the modern viewer would value more cutaways to graphics or other visuals.

**In Memoriam  
Archbishop Giuseppe Pittau, SJ  
1928-2014**

ITEST recommends to your prayer Archbishop Pittau, SJ, a native of Sardinia, and long-time ITEST member, who died and rose to new life in December, 2014 in Tokyo, Japan.

Archbishop Pittau, SJ traveled from Rome in August, 1999 to deliver the keynote address at the “30-Something” Anniversary of ITEST at Loyola University in Chicago. He was serving at that time as Secretary to the Vatican Congregation for Catholic Education, Seminaries and Institutes of Study. He is most likely strongly remembered as the President of Sophia University in Japan where he served for many years.

Archbishop Pittau was awarded a doctoral degree in Political Science from Harvard University in 1963. He received the Toppan Prize for the best doctoral dissertation in the Social Sciences from Harvard. In addition to his earned degrees, Pittau won many honorary degrees, among them a *Doctor honoris causa* in Law from Loyola University, Chicago (1987) and another from Saint Louis University in 1999.

Archbishop Pittau was Provincial of the Japanese province of the Society of Jesus (1980-1981) and Rector of the Pontifical Gregorian University from 1992-1998. He also served as Chairman of the Board of Trustees of Sophia University (1968-1975) and as President of that University from 1975-1981. During his tenure at Sophia University he wrote five books in Japanese on political, religious and educational issues facing that country. Among his many articles are “The Value of the Individual and the Role in Christianity in Japan” (*Japan Christian Quarterly*), 1966 and “Equality and Quality in Education” (*Monbu Jiho*), 1977.

Panel Discussion from the May, 2014 workshop led by Father Robert Spitzer, SJ  
*“Faith/Science Challenges: The God Question – How Do We Answer it?  
Do Teens Really Care?”*

The title of the workshop reminds us that high school graduates are often unprepared for what they may meet in the future from peers, college professors or others regarding challenges to their faith. The high school years are the time when teenagers begin questioning the tenets of their faith, yet the Church’s answers have often been weak. Many of the attacks on religion come wrapped in the mantle of “science,” advanced by people (often college professors) who don’t understand science themselves. Challenges to faith can come in many guises; the challenges treated in this workshop are the ones arising from the false arguments and claims of those who try to undermine the faith of the students.

ITEST and The Magis Institute of Faith and Reason co-sponsored this workshop inviting high school teachers of science and religion/theology of the Archdiocese of St Louis to participate. Following the Friday evening keynote address *“Evidence for God from Contemporary Physics and Philosophy,”* by Father Robert Spitzer, SJ, director of the MAGIS Institute, the teachers spent the weekend in small discussion groups with the goal of creating material which could be used in producing (a) courses in “apologetics” dealing with challenges to faith encountered by high school students.

*We are producing an edited version of the participants’ discussion during the Saturday afternoon panel. In order to retain the “flavor” of the oral discussion, we have allowed a certain flexibility in the transcripts regarding strict literary style. As you read this loosely edited discussion, you may find yourself actually hearing the people as they speak.*

**Tom Sheahen:** Think back to around 1900: What would it be like to be a teacher in those days? Classical mechanics was considered essentially perfect knowledge of the way the universe worked – it was believed that everything was deterministic, that there was nothing but atoms and molecules, that they would move around according to a calculation that you could do if you knew all the data ahead of time, and so on. This was the widespread belief, particularly in academia. Imagine yourself as a frontline teacher who cared about religious faith under those circumstances. By 1924 the emergence of Quantum

Mechanics superseded classical mechanics, and that deterministic philosophy essentially vanished. It didn’t happen overnight; it took a while to go away. But that idea -- that all we were doing was living in a deterministic universe—was very strong over a century ago.

Now let’s jump to the present day and look at the circumstances surrounding us, with the viewpoints being handed out (especially in academia) and the response of our people to this: the response that we want our children to have.

**PANEL MEMBERS** Fr. Robert Spitzer, SJ, Sister Carla Mae Streeter, OP, ITEST Member of the Board of Directors, William Bander, Science Teacher, St Louis Priory School and Cathy Hartrich, Religion Teacher, Nerinx High School.

**Carla Mae Streeter** I’m speaking from a theological perspective. I think it is very important for us as wholistic human beings, to realize that there are two forms of knowing – and that these two forms of knowing are very integrated. By looking at the two eyes in your head –it is so obvious to see, yet so simple – we have a single vision, even though we have two eyes. If we see double, where do we go? We go to the doctor right away. Those two eyes are so synchronized that we have a single vision – a wholistic, single vision.

One eye is the knowing that comes from loving. We call it faith and its perfection is wisdom. It is knowing that comes from loving. It is fostered by love; it is sometimes erotically experienced but it is knowing by affectivity –drawn from what’s worth something to you. As with the eye itself, the pupil is the entrance by which the eye sees. Faith is the wider knowing, the context for all other knowing.

The other eye is reason. By its work we know what can be measured. In the human eye it is the iris that expands and contracts to let light in for vision to take place. Iris and pupil work together. Neither of them are expendable. One without the other distorts the vision. If somehow we can become more wholistic, perhaps we have a good basis for a very homely, image for the way we humans operate.

In the Catholic tradition it is by a sacramental world

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view that we know that there is always more beyond what reason tells us – what we see phenomenologically, what we see empirically, there is always more. And the empirical – the reasoning eye doesn't always see the whole picture. But we have a way of knowing that something is there if reason has the faith eye in view. We say "You'd better check that out." --so that you don't become just one-eyed, leading people to only half the truth. So the critical sense must always be present. In the Jesuit tradition that is known as discernment. In the Dominican tradition, we call it discretion. Discernment has the working mind in view, and discretion draws in the loving heart.

I'll stop there, but I just want to put that image before us so that we keep a wholistic view: it's poetry, art, beauty, symbol, sacrament, and mystery that feeds one eye; and it is reason and philosophy and science and critical thought that keeps the other eye healthy.

**Cathy Hartrich** I was thinking too about "knowing" but Carla Mae stated it so eloquently. I'm sure with, it tradition includes intuition. That is a way of knowing (intuition) that is becoming more acceptable and more credible. I hope we can expand that sense of knowing better. I like that binocular kind of metaphor; it works very well.

**William Bander** Speaking as a science teacher, someone who makes a distinction between science and religion in the classroom as well as finding that common ground in the Catholic School setting, I'm in agreement with what has been said so far, but there is a lot to be said for having that wholistic view – while listening to the science side – that empirically knowing something because of physical tests and reasoned logic as well as the personal spiritual side of knowing something. The only thing I would add to that is the intellectual honesty that goes with admitting *not* knowing something. This comes a lot from the science ground because clearly there is a lot more that scientists don't know than scientists actually *do* know.

I think sometimes as teachers we often feel pressured by our students' inquisitiveness – we want to give them answers to their questions and we want to answer their questions and give satisfactory responses. Yet there is something at times—speaking from personal experience—we have to be able to say to them, "I don't know the answer to that question." I had a situation where a student said to me one time, "What do you mean, you don't know?" Mr. Bander, "I thought you were a science teacher." I responded "Yes, I am a science teacher, and that is why I don't know. There

are things that are yet to be discovered and our knowledge is growing exponentially." So while I disagree with nothing that has been said, I simply add the notion that our knowledge is growing bigger and bigger every day. There is still a lot we don't know.

**Sheahen** There is another kind of kick-off point too. Maybe it is a stereotype I have in my mind, but the influence of TV, and video games and others have really changed the nature of the children that are coming to us nowadays. And we just can't teach anything with sound bites; at least we can't get anything comprehensive understood by reciting sound bites. We saw last night, as Fr. Spitzer went through the BVG proof, that it takes real concentration – you have to be able to pay attention for a sustained period of time to really understand anything. And so we have the task of reaching children who may be heavily influenced in an adverse way by videos, games, TV and so on. As we stand here and think about how to put together a program to teach the kind of materials we talked about today and last night, I wonder if you all have some ideas about particular things to do to increase their attention span and to bring the students to really focus on the topics we want them to pay attention to.

**Bander** One idea I can offer is using those things you have described: the video games, the TV shows and so on, to get them engaged in the subject matter. I was talking with my discussion group about a lesson plan I had done just this past week in biology class on fungi. How do I make fungus interesting to a group of high school biology students? I remembered this past summer that there was a video game that came out titled "the Last of Us" It takes place across a post-apocalyptic United States. The player uses firearms, improvised weapons and stealth to defend against hostile humans and zombie-like creatures infected by a mutated strain of the Cordyceps fungus. This fungus infects people and turns them into zombies before killing them. For the first five minutes of my class I actually played a little clip of the video game from You Tube, and every student was hooked. There wasn't a single sleepy head in the class because..."...here is a teacher showing us a PlayStation 3 video game in school and it has to do with fungus"

I think anytime a teacher in whatever class it is, anytime you can use that YouTube, that video game, etc., you can teach the lesson.. I remember talking with some middle school students who liked the cartoon Avatar: "the Last

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Air Bender.” They were talking about the main character and how one of his friends wanted to go on a revenge mission to get back at the person who had murdered her mother. The whole time, the main character was saying, “You know, that might sound like a good idea right now; it sounds like you will finally have closure after so many years since your mother was killed, but it will only make you feel worse. Revenge is not going to give you the satisfaction you need -- forgiveness is what you need.”

Keep in mind, this is not a Christian cartoon. This is a completely secular Nickelodeon show that many middle school students like and yet, just having a conversation with them – I don’t teach theology – there was an obvious theological concept being taught. I can see any theology teacher using that episode or a clip from that episode in a way to teach a very real Christian concept. So, my take away from this may be “Don’t beat on them; join them.”

**Streeter** I say, ditto. There is a marvelous example of this in Jesus’ own preaching. He deals with images taken from ordinary life all the time. We are dealing with sensate people – feeling hearing, seeing. Jesus used concrete images, telling stories, front, right, and center, so that the abstract terms, the deepest ideas we want to get across are clothed in concrete images. The little theme song is “give me an example.” “Give me a bridge from my world to the world you are trying to present to me.”

So the use of images sparks the imagination, to get the students into new possibility because your goal is always to broaden the horizon, the intellectual horizon. Then those images give birth to a new idea, to a new concept that maybe was too small and too tight before. So it expands the mind and it stretches the intelligence so that the new concept can find room. I believe more and more that the use of imagery can do bridging, not only in science. Science starts there, with the empirical. But very often through imagery a then fully sacramental world view can form. As Catholic Christians we’re developing a sacramental world view. This means that in everything that surrounds us from the tiniest fingers of a baby to a flowering dogwood, to the ocean when I’m on the beach, to looking at a starry sky, to looking into my grandma’s face, to seeing someone cry, no matter what it is that we encounter in the tactile, empirical world, we see something behind that, that is *Mysterium*... that’s *sacramentum*... for within the visible signs there is mystery. Catholics are supposed to be really good at that. That is what we are trying to develop in our young

people so that their vision is not stunted, held hostage, but that they have a really wide ranging sacramental vision. If they don’t understand the real meaning of sacrament, unless they have that kind of vision, their vision is merely superficial. That mustn’t be. Sacraments are windows into the sacred; windows into Someone who is still asking, calling, working and meeting us in the day-to-day.

**Cathy Hartrich** In response to sound bites, attention span and TV, games: It’s the real world they are growing up with and that is what it is!! We are not going to change that; we just have to be aware and try to understand it better. I did not grow up in a “sound bite” world; I grew up in a different way and time. I am aware that my students are very fluent with media and they use it all the time. It’s their language -- social media. So we have to get on board – if you can’t beat ’em, join ’em. There is a lot to learn and we gain their respect.

But one thing I’m becoming more and more aware of – more than being entertained by using all kinds of media, especially social media, I think students crave a respect for themselves as individuals and as thinking persons. So as a teacher I try to be in that place where they can be the authority, that they can have researched an issue understanding the full context on both sides in all that I teach in ethics. Then I allow them to come to support their argument with evidence –through media – as a way for them to convey their message I think it works.

**Sheahen** We have questions from the audience?

**Voice:** I think it is important to use things (media) that they are familiar with, but in the case of the BGV\* proof, much more is required. Yes, we must meet them where they are but we also have to challenge them to reach beyond what they already know.

*\* Did the Universe Begin? III: BGV Theorem by Aron Wall Posted on May 27, 2014 There is a theorem due to Borde, Guth, and Vilenkin which might be taken as evidence for a beginning of time. Roughly speaking, this theorem says that in any expanding cosmology, spacetime has to be incomplete to the past. In other words, the BGV theorem tells us that while there might be an “eternal inflation” scenario where inflation lasts forever to the future, inflation still has to have had some type of beginning in the past. BGV show that “nearly all” geodesics hit some type of beginning of the spacetime, although there may be some which can be extended infinitely far back to the past.*

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*If we assume that the universe was always expanding, so that the BGV theorem applies, then presumably there must have been some type of initial singularity.”*

**Spitzer** I totally agree because I think a students like to be stretched because there are some students who will always take an easy class, but there are other students who want a lecture, who want to come out of the class knowing more than when they went in. When you think of some of the formative experiences you’ve had as a college or grad student, some of those varied experiences where you were stretched to the limit.

Another thing is that sometimes when we stretch those kids the one thing we want to tell them is “Don’t put your frustration bar or level down too low; tackle those darn sentences written by those German authors (that go on five lines long and have four dependent clauses) and make yourself read to that period at the end of the sentence even if you are getting a headache.” That discipline is going to pay off because one year later, after they read the four dependent clause sentences, they’ll tell you “I am reading this newspaper 100 times faster than I ever did before -- You know what I mean? They have stretched themselves.

**Streeter** Just a practical suggestion. In the undergrad class in the freshman year at college – that’s far away from where some of you are--- a real revelation to me when I was teaching theology, was to ask the students that they keep a notebook and after every class – here’s a technique that might work for you as it did for me – that they write a reflection of at least a paragraph from that class. I had thirty in the class so I would cycle taking in those notebooks and take ten in a week until maybe a week off in the end. I was blown away by the students’ writing; I was absolutely befuddled. I couldn’t believe it. They were arguing with me; they were commenting; they were pushing question after question because they knew quite well I was going to read it. Some of them were a half page long. But it began a marvelous ongoing conversation between me, and every single one of those students, every individual student. I wish to this day I had kept some of them. I fell into it, but it was a wonderful assignment. Those kids were really thinking about what we were discussing in class. And I had a clear view into their minds as to how they were putting things together. It was not a demanding assignment but caused them to become reflective which was exactly what I wanted to get them to do. They had to write – what was it we discussed in the classroom, what did that have to do with their lives, and what they intended to do about it.

**Mariette P. Baxendale, Ph.D.** Biology/Forensic Science Teacher, De Smet Jesuit High School **Dr. Baxendale submitted her thoughts following the panel discussion)**

I am thinking about understanding the context of the audience and accessing them. We need to meet them where they are, then bring them up to where we want them to be in regard to merging science and theology and retaining faith.

“In regard to meeting high school/college students where they are: 1. incorporate technology - many high schools utilize Moodle\*\*

*\*\* (a learning platform designed to provide educators, administrators and learners with a single robust, secure and integrated system to create personalised learning environments It is software that can be downloaded )*

Moodle provides the teachers with the ability to develop questionnaires and forums. Moodle questionnaires may be used to eliminate misconceptions (in regard to faith/science). The initial questionnaire may be administered prior to teaching content to understand where the students are, teacher may deliver the information, then students may go over the questionnaires again to see if there is any change in their thoughts now that they have a - hopefully, informed opinion. Forums may be utilized on Moodle to have an informed debate on opposing views. The forum would have to be structured so that the discussion stays relevant, and assessment on these forums would help ensure that the discussion is appropriately thought out and developed. 2. Other ideas besides questionnaires and forums: developing an app for the MAGIS Center’s Reason Series, a Facebook page, twitter, all of which can update each with something new

“In regard to meeting college graduates/young parents where they are: 1. “If you feed them, they will come...” Again to retain relevance, center about a social (food/beer) with speakers on jobs, marriage, young families, retaining faith within themselves and their children

“In regard to arming parents of high school/college aged children: I was just approached last week by a parent who is concerned that her daughter is dating an atheist. Her daughter’s boyfriend approached my friend (the parent) and challenged her on the existence of God! I was able to send her the link to the Reason Series Episode 2! [http://www.magisreasonfaith.org/the\\_reason\\_series.html](http://www.magisreasonfaith.org/the_reason_series.html)

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“Perhaps an idea would be to work via parishes/the archdiocese to disseminate information, even the link above to arm parents with information if and when they are approached by their son/daughter on the existence of God.

“In regard to helping Catholics continue on in their faith: With anything, one has to find value in retaining their faith. Why Catholic and why not another denomination? Why is my Catholic faith important to me? How is it filling a void? Is it relevant to my life? Is it accessible?

“And once Catholics decide to practice their faith: how may I grow in my faith?

**Fr. Mike Lydon** One of the gifts both science and theology bring to the students is the stated intentions of things. I’ll never forget my junior year in chemistry, I remember Father John Apple, SJ, in our chemistry class, urging us to observe in chemistry the different things that were happening. And that took a while, and then to write down what you observed what you saw and describe very carefully and then arrive at an equation perhaps. But this took time and you had to figure things out. It was a great way to discipline your thinking.

Another gift we can recommend to our students is *Lectio Divina*\*\*\* -- which the Benedictines have given us – the four stages of: reading the text, one thing that is very concrete, very practical – drawing them to different levels of reflection. That is one of the gifts we can give to our students especially in Catholic schools while we still can influence them some kind of formal way, Ignatian, Benedictine, Dominican, whatever, or all of them, but to sustain our text and understand its meaning, especially if it’s Scripture or some kind of inspired writing. My friend Ed Haessig here has done some creative prayer with his students before every class. It may simply be a method of be calming the kids down at the beginning with music, silence, or a combination thereof and helps them to focus. This is a gift we can give them and we ought not be shy about it.

*\*\*\*Lectio Divina is ideally a four or six-stage process. \ Authors usually mention four stages: reading (lectio) that becomes reflection (meditatio) that leads to prayer (oratio) which ultimately becomes contemplative union with God (contemplatio). It is probably more accurate and more congruent with most of our vocations to say that Lectio Divina involves six stages: (i) reading, (ii) reflection, (iii) prayer; in which we give thanks for what we have been*

*shown and ask for insight, for forgiveness, and for help to live what we have read, (iv) action, in which we live it, (v) contemplation, and finally (vi) ministry, in which we share the fruits of Lectio Divina with others. Only when this full cycle is successfully engaged in can be we said to be doing Lectio Divina. John O’Hagan, Oblate of the Monastery of the Ascension in Southern Idaho.*

Finally, we need to use both approaches: Yes, use the media that is flashy and so on that they use today and that they are used to but also draw them into the more ancient contemplative tradition as well.

**Spitzer** One of the things that does help is having that time with the students when you can talk about developing thinking skills beyond logical critique. Part of that is developing patience; and reflection is very difficult without patience. Science is impossible without patience. Reflection and contemplation within theology is impossible without patience. Patience underlies what I call the longer term expectations. And we have been touching on that over the past 20 minutes. I think there is an expectation that things should be short-term. And that very expectation makes the students extremely impatient. They think that certain things should come very very quickly, which can’t come quickly, If they just give that up for a minute and think, “This thing is going to take longer than I thought...and I’m going to give it the time that it deserves.” The patience begins to come: not only to do the experiments or derive the equation, but also that wisdom as Carla Mae started with this afternoon — that the students get these insights. For example, taking time for a project almost certainly will lead to a better paper.

I’ve done my fair share of writing a paper in a single draft, but my better papers were never done that way. When I gave it the time the papers deserved, they were much much better papers.

I think that long-term expectations and the patience that comes with it – for all the deeper important things— is the best kind of learning I got in graduate school. Unfortunately I didn’t get it in high school.

**Streeter** – Going back to what Fr. Lydon and Fr. Spitzer have pointed out – that in the ministry of education, when you’re in that ministry—yes, it is a job, yes; it is a profession also. But the very word, “educare” (education) means that in some sense you are the *formator*. You are not just doing a cubby-hole, narrow discipline. You are forming a human

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being. Michelangelo looked at what he carved and said, “Speak!” So you are helping to form a human being, a person who is going to go out in the culture and hopefully make a difference.

You are going to add the wisdom of Solomon or maybe faith, or understanding, history or math or whatever the teacher’s specialty is. But I think we can’t afford to forget that in some mysterious way we are called to form that child, that we are formators. So it is not just a nine to five, really. Most of you know that you go home and you worry about that kid who hasn’t been in class for two days because he doesn’t know where his father is. In other words, there is a bond beyond which your paycheck doesn’t do it justice. There is something human that is going on between you and those kids that they could never pay you for in salary...never.

**Voice** I have a very healthy respect for my students. They are intelligent and I have taught incredibly loving, hardworking, open kids whom I love dearly. I have found that tapping into that healthy respect for the students helps them to learn.

I have a really hard time sometimes with relating to the things they are listening to (sound bites, games, etc.) but I try to engage them on that level. Sometimes when we listen to the same things together, they come up with insights many times that are profound – ideas I may never have even entertained.

Sometimes when I have to say to them, “I don’t know the answer...”, they will come up with an answer. Sometimes when I think we have problems in the curriculum—religion and science perhaps for an example—sometimes I say to myself, “Ask them.” They’ll have an answer. The students come up with the answer—or at least an idea we have never thought of.

If you think of the material we had to learn at our age and what was available to us in terms of knowledge; it was miniscule compared to what students today have in front of them. It is almost an exponential body of knowledge these students have to absorb compared to what we had to learn, and we pile on more and more every year. They know a whole lot more than I do. It is a matter of asking them “How do we help you to understand that God is a loving God?” They are amazing and profound with reflections at a greater depth than we could ever imagine.

**Spitzer** If you want a profound book that brings that to

mind, take a look at a book titled “The Spiritual life of Children” by a Boston Psychiatrist, Robert Coles. He interviewed these kids of all faiths who provide marvelous insights into theology – stunning. He confirms exactly what you are saying – just thought I’d add that in.

**Streeter** There is an old story to add to that. A young mother had a four year old daughter and the mother’s mother died. She hemmed and hawed and hemmed and hawed. Should I take her to the wake or not? She’s too young, I won’t take her. But she went back and forth and finally said, “I’m going to take her to the wake.” When they approached the bier the mother burst into tears. The little girl took her mother’s hand, looked up to her and said, “Mommy, don’t cry; it’s OK. Grandma is like a seed, she has to be planted so that something new can grow.” This is straight out of St Paul. I think what you and Father have stated is so basic to our tradition, to our understanding. Why? Because we believe that due to the Baptismal experience the child is indwelt, is possessed by God in a new way, a way open now to a relationship. The relationship between God and that child will open like a flower, not yet mature; but that doesn’t stop God. So the presence within that little human being is going to operate, unbidden at times through that human consciousness. So why are we surprised? We just have to learn to listen, watch and see because the recipient now is no longer just a creature nesting in the Creator, but a child capable of an intimate loving relationship. There is the very wonderful possibility that we will turn toward the very mystery that is hidden in the basement of our soul. If a person is agnostic or atheist it doesn’t change the creation fact at all because we couldn’t draw a breath without the presence of God. That a person is totally unrelated to it (agnostic or atheist) is our human problem.

This is the marvelous being who, at times makes us want to pull our hair out: these young people!! This is the hope of a sacramental world view – to see to that core and to know that sometimes what comes out of them is coming through them and with them and in them. It’s as normal and natural as eating your breakfast. That is how close the baptismal relationship is, which for many is so esoteric, so “off the wall.” No, it isn’t. In reality it is as normal as your fingernails.

**Sheahen** What I’m thinking about as we look down here on the agenda for the day: “suggestions for action steps from the participants.” I’m listening to you talking about the remarkable spirituality of students, and I wonder if we

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can take that thought and turn it into action steps for this program in educating in faith and science.

**Spitzer** Well, I think we can do it in two ways. One way of course is to start from the vantage point of faith and then see science through it. That of course is an incredible approach. I don't know if you are familiar with Teilhard de Chardin and other authors who are in that tradition, who clearly use --- yes Teilhard is an anthropologist -- . He had the eyes of faith first and he brings that to his whole biological expeditions, his journeys. And Teilhard could be a little complicated, frankly, for a high school student. Yes, we want to stretch them, but we don't want to frustrate them either. He is truly a visionary who sees the aesthetic everywhere

(Note: We recommend two books for those who might find de Chardin a bit esoteric but who want to become acquainted with the life of this Jesuit scientist: *The Jesuit and the Skull: Teilhard de Chardin, Evolution and the Search for Peking Man* by Amir D. Aczel, Riverhead Books, 2007; and *The Making of a Mind: Letters from a Soldier-Priest (1914-1919)* Harper & Row 1961.)

**Spitzer** There is also what I call the Sir Arthur Eddington approach which sees through the eyes of science the faith. There is a wonderful chapter—Eddington was one of the greatest mathematical astro-physicists in the western world. He lived at the time of Einstein, Schrodinger, and so on. (Who cares about an astro-physicists, you know the whole world of physics is coming into being — here's the fifth known guy on the list). But frankly, he was brilliant. Eddington wrote this incredible book, *The Nature of the Physical World*. In the 5th chapter of that book, after he tries to bring together quantum and relativity equations, he comes to a defense of mysticism. You just have to read this, to grasp what's happening: while putting together the symmetry of the equations, Eddington touches on the spiritual question. "There are things untrammelled by the domain of physics, the things of art, the things of the spirit, the things of character -- even of science itself -- that challenge us. For science is dependent on an insight beyond itself in order to make itself work." In other words: in science, in order to ask the question, you already have to think or be beyond the limit of what you are looking for, so that the question will be intelligible. You can't know something is a limit unless you are already beyond it. And you can't ask the question until you recognize the limit.

Eddington is marveling in this, in that he is saying that

science is dependent upon the mystery of the human being; and then he begins to develop the studies "... "Whether in the intellectual pursuits of science or in the mystical pursuits of the spirit, the light beckons ahead, and the purpose surging in our nature responds." — Arthur Stanley Eddington, *The Nature of the Physical World* And he was trying to say poetically what Einstein always knew – that he always had the answer to the question before he even asked it.

Somehow there was something included in his consciousness that already transcended the physics of what he knew. Very much like Kurt Goedel (the scientist I was telling you about earlier, very clearly a man of faith, but I'm not sure what denomination he was if he belonged to one). If you take the six greatest physicists of the 20th century, every last one of them was a spiritual person, for example Erwin Schrodinger, he was more Eastern-rite I think; Max Planck, he was a good Lutheran, Heisenberg was a good Lutheran, Einstein was Jewish and although he didn't believe in a personal God, he believed in a superior mind.

(Eds.) Here is a quote from Einstein in *Ideas and Opinions* (New York: Random House 1954), p. 255; Jammer, p. 132. "This firm belief in a superior mind that reveals itself in the world of experience, represents my conception of God.."

**Spitzer** When you look at all these scientists, these greatest geniuses in physics, mathematics and so on, the insight they had was something that went beyond any algorithmically finite structure described by the essence of their discipline and the method of their discipline; it was an act of humility -- not just the humility of looking at the beauty and symmetry of nature -- but the beauty of themselves as already being beyond it. It says that the life that glows ahead and the purpose surging in our nature will respond. This act of humility causes them to see the beauty of their own consciousness over and above the disciplines of physical equations and so on; and they looked at this and said, "God !" That's another way in which this kind of spirituality comes into being, where science finds itself in the midst of faith.

For me this is the tragedy of the new atheism in some ways. Some of the physicists of today – I'm not saying they don't have the act of humility – but something is missing. Whereas these other men I mentioned before were in the

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midst of the most remarkable Renaissance of science and mathematics, they didn't miss it. Something about "mystery" and their openness to mystery, and something in the humility about themselves and recognizing the beauty of their own consciousness, all congealed together to give them this vision metaphors. They used words like parts of God or "light" or beckoning or surging or whatever metaphor they used -- the opposite way of Teilhard. But they both work. That's why we see that when science and religion reach their complementarity, the beauty makes you quake; it is just awe-inspiring. If you examine the capacity of the human consciousness to know math intelligibility, beyond algorithms as formulated, it makes me *quake*. If we could give just an essence of that to our students -- and this is called theological aesthetics, When the beauty of science and the beauty of theology and the spiritual life reach a nexus, it just makes you *QUAKE*.

**Cathy Hartrich** Regarding and action plan, I think it's really valuable to challenge students to be in a position where they are articulating their faith, their belief and understanding and to be able to express that in writing. And I believe in public speaking too both in small groups and large groups. This is really a very special time for these young people in secondary school. Most of the students from my school are not going to Catholic colleges or universities and in some ways I think this might be a very formative and possibly a final opportunity for them to be in a position to articulate faith and reason. They must do that out loud and in dialogue with each other. By being able to articulate their faith they are affirmed. They will not be intimidated by the atheists. To achieve this they need practice so that by the time they go to college, -- wherever that may be -- they will be comfortable with articulating their faith. As a teacher I always challenge the students with, "Well, what's the other side.." No matter what your position -- well if you believe in whatever the Church teaches, fine, but what is the other side? What is the other perspective? So they have to be able to articulate the counter argument as well as the argument they are defending.

So, I believe the opportunity for us, "the Michelangelo's" to help them become what they want to become but to understand, because they are in process. They may be sharing themselves publicly in a college setting in a way that they might not do openly if they hadn't had practice in high school.

**A Science Teacher** I am a science teacher and I have to say that I am challenging myself right now to use the word we hardly ever use in science: the word "God." The other things we use, such as spirituality, prayer and so on are all fine but we can't be afraid to use the word "God" even in science class. I'm challenging myself on this too. After all if God is the Creator of all things --which most of us believe -- then why leave God's name out of this area?

Fr. Spitzer, one of the things I learned from the MAGIS Center's DVD "From Nothing to Cosmos" (FNTC) is that you open the DVD using the three-letter word that we don't often use in the science classroom and this is GOD. One of the things that we as science teachers need to challenge ourselves to do is to use the name GOD specifically -- not to just talk about faith, spirituality, prayer and so on. But the first knee-jerk reaction I can predict from most of my students as they watch that video is that you start off with the name of God. What? God in a science class? However, the name GOD or the term GOD is not one that we are using enough. I challenge myself as a science teacher who brings in God quite frequently, but I don't use the name God enough -- the DVD states it openly. So I like "From Nothing to Cosmos" for that reason -- it's right there out in the open -- the name GOD. In the DVD there is no mincing words there, this is what we are talking about.

Things like this can help the kids to lose the fear of having a conversation about "Oh, my God!!! GOD!" So I like the DVD, FNTC, and I use it in my upper level classes and intend to use it again this coming year.

**Spitzer** First of all, thank you for that. It is so interesting that you pointed that out which we did very consciously. Part of our initial discussion was: "Should we use the "G" word up front?" I had an experience in a "former life" -- I used to head up a big ethics institute --at one of the large U.S. corporations, Boeing, in this instance.. We had a discussion with the Board of Trustees about what I should wear when we met. Should you wear a nice coat and tie or a Roman collar --what is going to be the way to go? It was evenly divided and at the end of the day one guy just said something that I kind of ran with. He said, "Suppose you do wear your Roman collar and everyone looks at you and says, "Oh gosh, now I've got to get ethics from some darn priest." The trustee added, "Don't you think you can win them over in five minutes; don't you think you can fascinate them in five minutes that they are just "collar-

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blind.” I just said, “Well, maybe I can.” He said, “The only way you’re going to find out is to do it.”

So I went into the corporate meeting area, met the first 400 managers and lectured in my Roman collar on ethics. Alan Mulally, a former president of Boeing, the person who invited me, came over to me and said, loudly, “Good for you; you didn’t lose the collar and that’s fine.” So I started my lecture and after five minutes they were “collar-blind” because I started talking about the four levels of happiness. Because the material was pretty good, and it’s important, they decided that they would listen carefully and apply it to their lives not only at Boeing but at home with the family.

After the lecture people would come up to me and say, “Wow, this is the best material.” It was something. “Could you do something for people with faith on the side who want to do it voluntarily?” All these doors just opened up.

So, getting back to the point of using the word “God” even in science class. So sometimes you just have to take the risk and see if the fascination of the material can overcome other presumed obstacles – such as the use of the word, God in science class.

So -- addressing the science teacher – and the key thing is, you are very right about the opening of the DVD. We did it very consciously, very deliberately, and I’m very grateful you noticed.

**Bander** As a science teacher myself, I would be remiss if I didn’t point this out at the risk of being a downer. When you bring up the issue of God or spirituality in a science classroom, even in a Catholic school, it is very important that you also remember how you present it. There is a risk that every religion experiences, including the Catholic Church, whenever you cross the streams of both science and religion. There can be a very real misconception that students then assume that science and religion are one and the same. Or that you can scientifically prove any concept in theology. This is something that scientists try very hard to avoid – to leave their own personal biases out of their research, out of their empirical discoveries. We try very hard to teach the students that science studies a physical empirical universe. While that certainly doesn’t negate the possibility of having spirituality, personal feelings, or any of those things that make us human, it is not a substitution for good old-fashioned empirical science. We are not saying that we can never utter the dreaded “G” word in science, but I’m sounding a note of caution, that when

you do incorporate it you don’t want this turning into a “Creation-ist” direction. Where people will say “Well, that means that the Creation of the Universe was in 7 days and the universe is less than 10,000 years old.” I know that sounds silly. Father Spitzer has a hard time with people who advocate that stance. There is a very real risk with the average lay Catholic falling into that trap. I can’t count the number of people I meet who are actually floored when I tell them I am a science teacher in a Catholic school and I teach Evolution to freshmen and the Big Bang Theory to eight graders, and I teach global climate change to seventh graders. They look at me like I’m a heathen and say, “Are there priests at that school too?” I answer, “Yes, “I teach at the Priory; the headmaster is a priest and also teaches science. He also teaches evolution, big bang theory and climate change too. So I’m pretty sure I’m not going to get excommunicated for what I teach.” But it’s amazing how many people, both Catholic and non-Catholic – because of what we’ve already discussed, the popular media, the technology culture --how they hear these sound bites and they think that science and religion are polar opposites that they are at war with one another. We just want to make sure that, whenever we introduce the concept of God and spirituality into any of the science classes, that the students realize that it’s not a substitution, that both of them can walk together in concert not conflict.

**Streeter** – Just a postscript. Let me start with an example. We all know what a picture and a frame is. When you look at a framed picture, you know very well what is the picture and what is the frame.

When you’re teaching theology, the God questions and the spiritual questions are the picture. But in this day and age, you had better know that science and quantum physics are your frame because we’ve got a new cosmology. When you’re teaching science, science is your picture but you need to know too that there is something more than that--and that faith is your frame. I think if we keep the focus of our discipline clearly in view and use the other discipline as context (Theology for science) (Science for theology) then we are both bridge-building and keeping our focus clear. And it helps our students to see with two eyes instead of one. However, there is a delicacy with that. For example you can’t go off on a tangent with the frame not in the discipline, if your discipline is science. That’s not the object of the class.

It is very interesting that there has been discussion in

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public schools as to how to teach religions of the world as a cultural reality. Very often the separation of church and state is always held up as “ Oh, no, we can’t go there.” Right, we can’t go there if we are proselytizing --- that’s the intent of that law. But to omit any reference whatever to the religions of the world is a cultural degradation and betrayal of the actual human situation.

If you are teaching history, then you refer to the religious reality as your frame, your cultural situation. And as far as I know, no one has been rapped on the knuckles for doing so because it is a part of human culture. Any students who would go to the principal’s office claiming that you are trying to proselytize and convert them to a certain religion is simply false, is simply wrong.

Part of the challenge of our work is really a kind of “both-and” with a real discernment of how we can keep a “wholeness” or a “wholeness” in our own world view and then introduce the same to our students.

**Sheahen** Thank you very much. It is time to draw things to a close. I think the concluding remarks of our panelists were particularly poignant because that is what ITEST has been trying to do since the founding in 1968—to bring faith and science together and to show their unity.

We are so delighted to be in partnership with the Magis Center in doing just that.

**Spitzer** I would just like to add a bit more here. I thought the feedback today was just outstanding. By way of the last comment — I think the symposium idea – the idea of bringing together the religion and science teachers for some kind of a program in the summer to share ideas on how to make the connections, how to put them together— this would be an incredibly important thing. I hope you don’t mind -- I’m going to ask Tom for your e-mails and work with Dr. Ed Hogan of Paul VI Institute and Tom and our diocesan representatives here to try and put together something. Maybe we can do this in the near future and hopefully we can galvanize some people on your high school campuses that will bring people together even if it looks like “One more darn thing. . . .” You know! But try to motivate your colleagues and play it up. I’m going to work on it because I really believe in it.

*(The fruit of this weekend workshop resulted in the production of a series of three Webinars hosted and led by Father Spitzer, jointly sponsored by the MAGIS Center, ITEST, the St. Louis Archdiocesan Paul VI Institute and the Catholic Education Office. Material presented at these free webinars (October, 2014, and Feb and March of 2015) would provide scientific and theological material for the Summer Institute, 2015, scheduled for science and religion teachers in the St Louis Archdiocese and beyond. Eds.)*

## Advances in Medical Technology

By Thomas P. Sheahen

December, 2014

*Published as a column for a Maryland Catholic newsweekly, during the Christmas Season, the article highlights some of the “gifts” of medical technology we have received through human ingenuity from the gracious hands of God. (Eds)*

At this time of year, we have so much to be “merry” about. In the last couple of decades, there has been enormous progress in medical treatments, and as a result several of my friends are still alive who surely would have died amid the technology of yesteryear. Every invention of a new medical procedure, every discovery of a new medicine, is an example of what God gives to mankind – the gifts of intelligence, insight and creativity. It’s way too easy to overlook what that kind of progress means to all of us and our families.

Certain things have long been taken for granted, such as eyeglasses (legend has it that Ben Franklin invented bifocals). Dentures have been around a long time, too – George Washington had wooden teeth. Today schoolchildren routinely look through microscopes at bacteria, but two centuries ago there was no understanding of the role of bacteria.

Only the very elderly among us remember what it was like before penicillin was discovered. Even well into the 20th century, if a child got a disease like pneumonia, it was usually fatal. A century ago, parents were wise to have 6 or 8 children, to have confidence that a few of them would live to adulthood. World War I closed with an armistice because more soldiers were dying of influenza than from bullets.

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At Civil War museums, the surgical tools of the 19th century are on display. Amputation was the customary treatment for a bullet wound in the arm or leg. Another museum piece from the more recent past is the Iron Lung; and with it the disease of Polio, now prevented by routine vaccination. Most viewers of the movie *Forrest Gump* had no concept of his childhood affliction.

It's also hard to remember the last time anybody went to the hospital for "exploratory surgery," where the doctors would open you up and look around to see what might be wrong. That approach became obsolete several decades ago when non-invasive techniques were invented. The X-ray machine has been very helpful for a century, because it can see bones; but Computer tomography (the CT scan) was the first really good way of looking at internal organs. Magnetic Resonance Imaging (MRI) is another invention that gives doctors a different kind of look inside without having to cut a patient open. Positron Emission Tomography (the PET scan) is a fairly recent addition to the arsenal of medical imaging technologies.

Hospitals have departments of "nuclear medicine" where such tests take place, supported by a chain of technology that brings isotopes from a nuclear reactor to the patient's body in only a few hours. The planning, logistics and rapid interpretation of results was impossible a generation ago.

The Ultrasound machine produces excellent images of things inside the body, especially unborn babies. For two decades, kindergarteners have brought to "show and tell" a picture of themselves inside their mothers. If Ultrasound technology had been available in 1970, I don't think the Supreme Court would have decided (in "Roe vs. Wade, 1973) that an unborn baby is conveniently disposable and has no right to life.

The catalog of spectacular accomplishments keeps going. Many of us know several people who are cancer survivors, have had bypass surgery, wear a pacemaker, or have artificial knees or hips. Surgeons can put in a stent and send you home in a day. Serious sports injuries that used to end careers are now just a bump in the road.

Transplanting organs is another major lifesaver. It has taken a while, but over recent decades the success rate of transplanted lungs and hearts has gone way up. The

unheralded major accomplishment was to figure out a way to prevent the recipient's immune system from rejecting the donated organ; that medical wizardry was even greater than stitching in the new organ. By now, many people have "organ donor" indicated on their drivers' license – because the technology is reliable, and someone else's life can be saved.

Emerging from the research lab are technologies where nanoparticles travel through the blood stream and reach exactly the cells that need the medicine they carry. Achieving precision like that can only come by assembling forefront knowledge of chemistry, fluid mechanics, medicine, and the intricacies of the human body. Think about the combined efforts of so many brilliant scientists: how did they come up with their ideas?

At Christmas time, we're reminded that the reason we give presents is as an imitation of God's great gift to humanity. As the progress of medical science demonstrates, God hasn't stopped giving us gifts, acting through the channel of human intelligence. I thank God for the gift of my family and friends who are still alive and healthy. As I get older and realize that I can't take good health for granted anymore, similarly I'm not taking those scientific achievements for granted either. They aren't something we're automatically entitled to; they're a gift.

"Perhaps our own times offer us as great (or greater?) challenge as any generation of Christians has had to face. We are blessed to live in a time when Christianity is beset, seemingly on all sides, with controversy, uncertainty, hostility and weakness—in other words, with a decline that can presage only a new birth.

"Science and technology are contributing mightily to what will be a true Christian renaissance, if our history is truly prologue to our future. Biotechnology, for instance, will play an enormous role in our prayerful attempts to understand what God has created and what he wills for that creation. We can (and we must) all contribute to that growth by our concern, our thoughts and, above all, our holiness."

*(Father Robert Brungs, SJ,  
ITEST Bulletin, 1988, Volume 19, No. 2.)*