



# Institute For Theological Encounter With Science and Technology

Volume 49 - # 4

Fall 2018 Bulletin

## ***Farewell, Adieu, Adios, Addio, Ave Atque Vale, Auf Wiedersehen***

Someone asked me once, “What is a person with your background in music (MMus) and communications (MA) doing in an institute that studies the relationship between faith and science?” I have to guess it was the Holy Spirit. I have no other answer. And the Spirit was right on!

Little did I realize in 1986 when I started full time work at ITEST as editor of the quarterly bulletin and communications director, that I would still be “communicating” with you all —some in Heaven of course—in 2018, during ITEST’s 50<sup>th</sup> Anniversary. Back then, after some heavy lobbying from Father Brungs, Sister Mary Christopher, Provincial of the Religious Sisters of Mercy, recognized the value of the faith/science ministry in the Church and missioned me to a three year term, which morphed into 32 years, with ITEST. Even though the stipend would be less than I was earning at the Diocese of Providence as Communications Director, S.M. Christopher was convinced that Father Brungs’ vision for the Church more than compensated for any consideration of a “hefty salary.” Even then, Father Brungs would often remind the staff that ITEST is a” mendicant ministry.” You may recall our present director, Tom Sheahen has often echoed that sentiment in yearly renewal and fund raising letters.

If I were to recount our accomplishments during the last three decades, important as they are, it might appear to be simply a list of topics in faith/science, worthy in themselves but not necessarily the “stuff” of remembrance. Here is what I remember fondly about my years in ITEST: Colleagues from the early days, like Thad Niemira, John Blashke, Fred Mc Leod, SJ, Bob Morey, Alan Willingham, Bob Bertram, Ann Bannon, Judy Cassilly, Ben Abell, Dick Cusack, John Hubisz, Donald Keefe, SJ, Marie Sherman, Hugh Beck, Peggy Keilholz, Joop Schopman, Bernice Morris, the litany of the “saints” and a host of others, who helped ITEST to grow in its understanding of “what it means to be human.” Please forgive my oversight if you don’t see your name here, know that it is written on my heart.

Finally my main feeling at this time is one of gratitude for the challenging work that drew me out of the more narrow aspects of my life and profession enriching me in designing projects to think creatively in unanticipated ways. My favorite author, CS Lewis in Letters to Malcom on Prayer writes, “Gratitude exclaims, very properly, ‘*How good of God to give me this*’.” How could I say it any better?

Thank you for your support over the years. I ask you to give the same support to our Director, Tom Sheahen whose involvement and leadership made it possible for ITEST to continue to exist fiscally and for setting the direction of yearly conferences to the topics in faith/science that are neuralgic to our world today.

Gratefully in Our Lord and Lady

S. Marianne Postiglione, RSM

PS I will continue to be a member of the ITEST Board of Directors.

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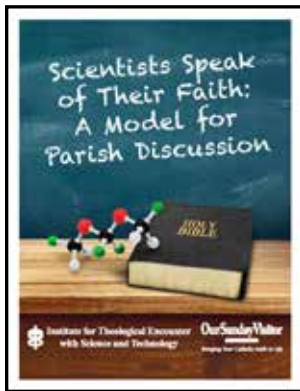
## Announcements



**Come join us!** The stage is set and, the speakers chosen for the ITES fall conference on *Our Lady of Guadalupe and the Tilma of Saint Juan Diego: Cultural, Scientific and Theological Considerations*. The Sunday afternoon event, November 18 from 2-5pm, will be held at the Rigali Center in St. Louis. People from the Midwest and beyond are eager to learn more about this new icon of the Church and of a new America, the title of the talk of our first speaker, D. Bruce Nieli, C.S.P. Father is a Paulist Priest and former director for Evangelization, USCCB and has traveled

widely speaking about Guadalupe. Dr. David Keys, physicist and Catholic speaker will examine the miraculous aspects of the Tilma of Juan Diego, highlighting the series of coded messages contained within the image.

This year ITES is collaborating with two St. Louis Archdiocesan offices: Hispanic Ministry and Sacred Worship to host this afternoon event. Obviously the Hispanic community as well as other Christians/Catholics have a close affinity and devotion to Our Lady of Guadalupe, a universal figure. Conference Fees: \$20.00 Early Bird; After November 12, (or at the door) \$25.00.



**We proudly announce** the completion of the first phase of *Scientists Speak Of Their Faith: A Model For Parish Discussion*, a project funded by Our Sunday Visitor Institute. Launching the project in parishes in the St. Louis area comprised the first phase; whereas the second phase will consist in timely marketing and promotion. As a result this project should be widely adopted/

adapted for use in parishes around the country. ITES is offering the complete package (guidebook and video clips) to all who access the link [www.faithscience.org/msspeaks.html](http://www.faithscience.org/msspeaks.html) free of charge. We urge you to view the entire packet at that special web page on our ITES web site. We welcome your feedback and ask you to promote this program in your parishes. If you need further information or assistance please contact ITES at [mariannepost@archstl.org](mailto:mariannepost@archstl.org) or [tsheahen@gmail.com](mailto:tsheahen@gmail.com)



### Spotlight on an ITES Member

Sister Marie Louise Pohlman, OSF, joined ITES in 1975. Since obtaining her MS in microbiology at St. Bonaventure University in 1970, she has had an intense interest in bioethics. As a result, she took four week long seminars on the various facets of bioethics at St. Mary's College in Cincinnati, Ohio, and recorded all the talks for later use. This helped her update the high school bioethics course she introduced at De Sales High School in Columbus, Ohio, during which time she served on the Bioethics Commission for the Diocese of Columbus. Subsequently she wrote a book, *In Search of Morality: A Biological Approach*, which had an Imprimatur from Bishop George Fulcher, auxiliary Bishop of Columbus. He recommended she teach Nursing Ethics at Mount Carmel School of Nursing, the position she held for eight years. She explored the healing system of REIKI (a form of energy therapy) and found it valuable in its use of healing of memories. She also taught at the Pontifical College Josephinum for nine years, where, as Associate Professor, she introduced a course in Spirituality and Healing, a course she wrote while living for 10 months at Light of the Mountains, Home of the Healing Order of the Sufi Order. She has had extensive experience of other cultures, especially in the Dominican Republic and Sri Lanka.

She also worked at Heritage Day Health Center as an activity therapist and used her knowledge to enable clients to enjoy their "Golden Years", despite suffering from strokes, Alzheimer's disease and other age related limitations. After more than 19 years at the Center, she retired at 73, but remained active in the community. Following a bout with breast cancer, she began making a variation of Artist Trading Cards, which she distributes to lift the spirits of anyone she meets. In 2015 she moved to Buffalo, New York, where she is serving on the IRB committee for the Catholic Health System and the Merillac Guild at Sister's Hospital. Ad Multos Annos, Marie Louise!



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## Announcements



Donna Strickland, from Canada, **shares the Nobel Prize in Physics** with two men. She is only the third woman winner of the award, along with Marie Curie, who won in 1903 and Marie Goeppert-Mayer who won the prize in 1963. Dr. Strickland shares this year's prize with Arthur Ashkin from the US, and Gerard Mourou from France. It recognizes their discoveries in the field of laser physics.

Dr. Ashkin developed a laser technique described as optical tweezers, which is used to study biological systems; whereas, Drs. Mourou and Strickland paved the way for the shortest and most intense laser pulses ever created. They developed a technique called Chirped Pulse Amplification (CPA). It has found uses in laser therapy targeting cancer and in the millions of corrective laser eye surgeries which are performed each year.

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## God and Evolution

by Thomas P. Sheahan

When we enter into consideration of the often-controversial topic of the connection between God and evolution, usually the starting point is the presumption of bitter opposition. Atheists have very stridently insisted that evolution opposes any notion of God's participation. In reality, however, there are several different factors all mixed together in the creation-evolution domain. What is often lacking most is a goodly dose of humility. The first thing I always tell people is that "If God feels like using evolution as His means of creating, who are we to second-guess Him?"

Humans really need to be humble and realize that what we *don't* know greatly exceeds what we *do* know. In schools, the reason we teach evolution is that it's the very best theory we've got *at this time*. That practice would be equally true of how we teach physics or any other science. A century ago, physicists taught Classical Mechanics, unaware that Quantum Mechanics was just around the corner (in the 1920s). Will there be some breakthrough in our understanding of life sciences that calls for a modification of the theory of evolution? Maybe so, maybe not. But we should all recognize that when dealing with science, we don't have absolute certainty, but we go with the best theory we've got. Hence evolution is currently favored very strongly.

Trouble is, some people (who fail to understand a basic principle of science) pretend that evolution is totally and absolutely correct, the last word on the subject. That is entirely due to their own scientific weakness, and must never be confused with the wisdom of God.

Classical Darwinian evolution from the 19th century rests on the three pillars of:

- a) random mutation
- b) natural selection
- c) deep time

With the subsequent discovery of genetics by Mendel and later the understanding of DNA as the code for everything living, we have today what's known as "Neo-Darwinism". A whole lot of things fit together very well, and without evolution, nothing makes sense.

One very key difficulty is this: time simply isn't "deep" enough. 4.5 billion years (the age of the planet) is not enough for the process of mutations and selection to produce all that we see today. Biological changes simply do not happen that fast. Attempts to patch up the theory, with notions like "punctuated equilibrium", do not give satisfactory results. Looking back >150 years, we now recognize that Darwin had no way of knowing how much time was really required, and hence his hypothesis of "deep time" seemed plausible to everybody.

A major principle of those who hold to strict Darwinism is that there is NO direction or purpose in any of the changes; they absolutely reject any kind of "teleology" or recognition of purpose in the evolutionary process. This is where we Christians differ strongly with the atheists. We say that God is so smart that He could build in a "direction" or "arrow" of evolution, and people just aren't smart enough to detect it. For the atheists, it's a *really* important point to

*Continues on page 4*

insist that there is no direction or purpose. With the passage of time and the increasing sophistication of scientific knowledge, they're losing the battle. It appears that, just as there are "anthropic coincidences" in physics, there may be something going on in biology that is designed into the system in order to bring about the observed result of evolution -- namely intelligent life forms such as people.

Another key topic is the matter of time itself. Atheists sneer "well, if your God is so powerful, why did it take him so LONG to make all of nature come about?" That completely fails to recognize that God is by no means limited to following the human perception of time. We see time creeping along slowly, while God is simply "present" to all time. As St. Augustine wrote long ago, God is the Creator of space and time. By a "Transcendent Being," we mean that God transcends the universe, He transcends space and time, and needn't obey our very truncated perception about time.

This understanding of time is very difficult for humans to grasp. When language is unable to express a concept, science is unable to describe it. That is why we have to move into the realm of faith, because science is unable to say anything at all about things that transcend science. It's okay to cross that boundary line, but we need to recognize when we do so.

Unfortunately, most people (including most Christians) are unable to comprehend any version of time except the one where time is linear, consecutive, absolute, etc. We cannot actually operate in the land of Relativity, even if we nod in agreement with it mathematically. It's just part of human nature to treat time as an absolute, irrevocable, and one-dimensional progression.

That causes a lot of people to adopt a really clumsy image of the human soul, and how God creates it. We say "evolution might have made the body, but God made the soul" and by that, we imaging God standing in a factory assem-

bly line, inserting souls into little babies at exactly the right time. (There was a hilarious Jackie Gleason comedy routine about an assembly line a half-century ago.) Again, this human constraint causes us to imagine a very demeaning picture of God. God doesn't have to stand around stamping out new souls consecutively; rather, He created a system and mechanism, expressed via DNA, which assures that those creatures who are "human" will participate in all those aspects of life that comprise a "soul" (intellect and free will.). There is a line in the Encyclical *Humanae Genensis* by Pope Pius XII that uses the word "immediately" for the creation of the soul, and most people infer that "immediately" must mean "at a point in time." God simply is not that clumsy or limited -- it *us* who cannot see how He does it, but that's *our* limitation, not His.

Sooner or later, it all comes down to our ability to accept and understand the limits of human thinking. The bottom line is that we must not try to impose limits upon God. We need humility. For physicists, we have examples from the past: in the 18th century we all believed in phlogiston (prior to Oxygen), in the 19th century we believed in "the Ether," and in the early 20th century believed in Classical Mechanics, with its implied determinism. Having seen all those concepts bite the dust, we won't commit unequivocally to any theory, not even ones that look very good, like Quantum Mechanics and General Relativity. We physicists wish the biologist would have the same sober attitude toward their leading theory - evolution.

To comport religious faith with evolution, the obstacle of our preconceived notions must first be overcome. The cornerstone of new learning is to say "God is a whole lot smarter than me." It's reasonable to expect everyone else to concede "me too." After that, it becomes possible to explore how faith and science fit together in a partnership, with the goal of slightly advancing our knowledge of both *how* and *why* God created everything.

*"The evolutionary consciousness of most secular thinkers today is one that simply cannot map the hierarchical vertical static view onto the horizontal unfolding of the universe where there are no crisp lines of division. The problem we face theologically and ethically with evolutionary naturalism is this: How can you make an intellectual case for the hierarchical view which we need to retain in some sense."*

- **Jack Haught**, *Faith, Science and Culture*,  
*Proceedings of the ITEST*  
 40<sup>th</sup> Anniversary Conference, 2008

## An Unrealistic Approach and Analysis of the Blood Flows on the Shroud of Turin

by Mark Antonacci

A recent paper by Matteo Borrini and Luigi Garlaschelli titled “A BPA Approach to the Shroud of Turin” was recently published in the *Journal of Forensic Sciences*<sup>1</sup>. This paper contains the bloodstain patterns from two sets of experiments in which:

- 1.) blood from an overhead bag was released through a small thin tube located at the back of the wrist of one of the authors, and which
- 2.) blood flows were made on a plastic mannequin by pressure being applied on a small sponge soaked in blood.

From these experimental results, which differ from comparable blood flows on the Shroud of Turin, the authors conclude the blood flow patterns on the Shroud are unrealistic and indicate they were the result of artistry or were faked. In this article I will briefly explain how both sets of experiments are flawed in several respects, how the blood flows on the Shroud are quite realistic, and how the authors’ conclusions are necessarily flawed. All of the comments that I will make about the blood marks on the multiply-wounded crucifixion victim wrapped in the Shroud are supported by decades of research by numerous pathologists, physicians, anatomists, battlefield surgeons, scientists and forensic experts cited throughout both of my below books.

The first thing that should be noted is that in both sets of experiments the authors used blood with an anticoagulant. This prevents blood from coagulating as it naturally does when it leaves a human body. The anticoagulant helped cause the blood in their two sets of experiments to be too runny and more fluid than the blood on the man in the Shroud. According to Italian physicist Paolo Di Lazzaro, who has seen both the illustrations and the film that accompanied the four year old experiments, the blood was too fluid and almost looks like colored water.<sup>2</sup>

In the authors’ first set of experiments, the thin blood flowed straight down from one of the author’s wrists to his elbow when his forearm was in the vertical po-

sition. In contrast, the blood flows on the man in the Shroud run from his wrists to his elbows in two different partially horizontal angles. These two streams are seen on both forearms of the man in the Shroud and are quite realistic with the positions that a victim would be in during a crucifixion.

When a crucifixion victim was suspended from a cross he couldn’t breathe because he couldn’t exhale. In order to exhale, and thus breathe, he had to push himself up with his nailed feet and pull himself up by his nailed wrists. When he raises the trunk of his body, he raises his shoulders, which alters the horizontal axis of his arms around 10° or so, causing two partially horizontal blood flows.

By continuing in this see-saw manner, a crucifixion victim could stay alive on the cross for as much as a couple of days. The crucified victim that was wrapped in the Shroud of Turin appears to have already been severely scourged, crowned with thorns, beaten about the head and face, had scrapes across his shoulders, and had fallen. Although a crucifixion victim in this condition could not have prolonged his life for days, he could have lived a few more hours by continuing this up and down movement.

Over the course of a few hours, blood containing serum would have continued to flow toward the elbows in partially horizontal streams that were sent from a weakening, but still beating heart. As Dr. Di Lazzaro also notes, the tortured man in the Shroud was likely dehydrated. If this man was the historical Jesus, he

*Continues on page 6*

### Mark Antonacci

President and Founder of Test the Shroud Foundation, author of *The Resurrection of the Shroud*, (New York, M. Evans and Company, Inc. 2000) and *Test the Shroud*, (St. Louis, Forefront Publishing Co., 2015). Attorney at law, e-mail [antonaccilaw@aol.com](mailto:antonaccilaw@aol.com).

would not have eaten nor drank since the previous day. All of these tortures would eventually lead to the man's death. The victim's dehydration and the coagulation of his blood would have caused his blood to be more viscous and to flow slower, as would the sweat, dirt and swelling on his body.

The bloodstain patterns produced in the authors' artificial experiments are very unrealistic in other aspects from those of a crucifixion victim. As would have existed with an actual crucified victim, serum from the coagulated blood has been identified on the blood flows at the wrist and forearm of the man in the Shroud, as well as on numerous other blood marks and blood flows throughout his tortured body, including his side wound and the small of his back. The lack of serum or coagulated blood on any of the authors' bloodstains is another unrealistic trait.

The authors also make the point that there is a gap in the blood flows between the wrist and the lower forearm of the man in the Shroud. They should clearly know better. Everyone who looks at the full-length frontal image can tell that the man's buriers have intentionally placed both of his hands across his groin for purposes of modesty. This gap area, seen on both lower forearms, would have been a very logical area for the buriers to hold when moving the man's forearms and hands, which were in rigor mortis. In addition, these parts of the forearm could have been held by those who were carrying or transporting the body from the cross to the tomb.

In the second set of experiments, the authors took synthetic blood with anticoagulant and soaked a small sponge in it. This sponge was attached to the end of a flat stick that was in the shape of a yard stick, but only about half as long. In another incorrect manner, they attempted to simulate the post-mortem spear wound and blood flows of the man in the Shroud by holding the stick *horizontally* and shoving the small flat sponge against a standing plastic mannequin. This resulted in blood splaying or spreading in three or four streams along the front and side of the smooth plastic mannequin.<sup>3</sup> Now you don't need to be a physician or scientist to recognize that this is not how a crucified corpse would have been stabbed or bled.

Because of the factors discussed earlier, the blood from the right side wound of the crucified victim on the Shroud would also be thicker than the blood used in the authors' experiments. In addition to blood and serum, there was a large amount of clear watery fluid that also escaped from the pleural cavity in the chest of the man in the Shroud. Both the post-mortem blood and watery fluid oozed from the side wound by gravity in one flow after the man's right auricle, which fills with blood upon death, was pierced by a spear. This wound is located a few inches below the heart. It would have been inflicted by an upward thrust into the dead crucifixion victim still on the cross and would account for the largest amount of blood and fluid on the Shroud.

The authors' inability to duplicate or understand the presence of the horizontal blood flows across the small of the back also contributes to their erroneous conclusions regarding the blood on the Shroud. I once asked STURP scientist Don Lynn to explain the horizontal flow across the lower back of the man in the Shroud. He explained to me that STURP scientists once poured water down the right side of a young man who was voluntarily suspended in the vertical position that the man in the Shroud appeared to be in when he died on the cross. Dr. Lynn said the water not only ran down the front of the volunteer's right side, but that it curved when it got to the narrower lower part of his front hip and went around to his lower back. While no one can say for certain how the post-mortem fluids ran across the lower back of the man in the Shroud, STURP's experiment indicates it could have happened while the man was in the vertical position.

In addition, think of the various positions that the man in the Shroud would have been in after the post-mortem fluid flowed down his right side. After the victim was taken down from the cross, he could have been laid horizontally at the foot of the cross. He would most likely have then been carried or transported horizontally to his burial tomb. This would have continued as he was carried horizontally into the tomb and laid horizontally within his burial shroud. While most of the time the body would likely have been face up, there could have been times when he was face down or even somewhat on his side, especially when he was

*Continues on page 7*

being taken down from the cross. So, the blood could have transferred across his lower back in any number of ways.

One way the blood could not have transferred across the *lower* back was from another erroneous method utilized by the authors in their last experiment. Here they took the same stick with the same kind of sponge and soaked it in the same synthetic blood containing anticoagulants. However, in this experiment they shoved the stick and bloodied sponge against the middle of the right side of a plastic mannequin that was lying on a table in the horizontal position. The authors even tilted the table 5° clockwise and counterclockwise. While the blood again ran in three streams, they ran from the mid-right side of the mannequin's chest, *around* its right side, and onto the middle of the mannequin's back—where it collected in a puddle on the fabric that covered the table and laid under the mannequin.<sup>4</sup>

While this didn't duplicate the post-mortem blood flow across the *lower* back of the man in the Shroud, it *does* show that blood can travel horizontally across the back when the body is in a horizontal position(s). I don't know whether the authors realized that when a human body is in a supine or reclined position that the middle part of the back has much greater contact with the underlying surface than does the lower back or "small of the back." (This can be confirmed by a simple experiment in which a person lays on a hard wood floor with their shirt off in front of an observer or next to a mirror. The observer will see that the person makes contact with the floor at the middle of his back and at his buttocks, but not at the small of his back.) If the authors would have undertaken similar horizontal experiments near the lower side of the mannequin's or a person's back, they might have seen that a large quantity of blood and watery fluid could have traveled all the way across the lower back of their horizontal model, since it could flow unencumbered by the lower back's contact with an underlying surface.

In so many ways, the authors' methods were inappropriate, causing them to make erroneous comparisons between their blood flows and those on the Shroud. Worse yet, the authors employed the logic that, because the blood flows on the Shroud did not match their erro-

neous experimental results, the Shroud's blood flows appeared to be unrealistic and the work of an artist. The authors couldn't be more backwards in their analyses and conclusions. The results of their necessarily simulated and unrealistic blood flows could not match the realism of even some of the many blood marks and blood flow patterns that appear throughout a real crucifixion victim who was wrapped in the Shroud of Turin.

#### End Notes

1. M. Borriani and L. Garlaschelli, "A BPA Approach to the Shroud of "Turin," *Journal of Forensic Sciences*, onlinelibrary.wiley.com.
2. A. Tomielli, "'The Shroud's fake blood stains'. But this new research raises many doubts," Vatican Insider La Stampa, <http://www.lastampa.it/2018/07/17/vaticaninsider/the-shrouds-fake-blood-stains-but-the-new-research-raises-many-doubts-xILD-M9GgogvYLFbVvSXIZEI/pagina.html>
3. See Fig. 7, "A BPR Approach to the Shroud of Turin."
4. See Figs. 8(a) and 8(b), "A BPR Approach to the Shroud of Turin."

*"As an agnostic lawyer in 1981, I stumbled onto an overview of the findings from the first and only comprehensive scientific investigation of the Shroud of Turin. The evidence that was discovered on this burial cloth by scientists, physicians and other experts was not only astounding, it was new and original. It could only be described as unprecedented, as it contained many features that science had never seen before. It was not only new, it was very extensive, unique and most of it was unfakable. As an attorney who relies on evidence, I was intrigued by the extent and quality of evidence that was found on the Shroud and wanted to learn more about it."*

- Mark Antonacci,  
*Test the Shroud:  
At the Atomic and Molecular Levels,*  
LE Press, LLC, 2015,  
p.i, From the Author.

## Theology of Inventiveness

by Dr. James Bornholdt

*In this piece we present some of the findings from the workshop on “Theology of Inventiveness” with 9<sup>th</sup> grade students at Rosati-Kain High School in St. Louis.*

“In May, Dr. James Bornholdt visited the 9th grade physics classes at Rosati-Kain High School. Dr. Bornholdt is an engineer at Boeing and is currently studying for the permanent deaconate in the Archdiocese of St. Louis. Dr. Bornholdt spoke with students about his “Theology of Inventiveness,” connecting the human ability to create and invent with the creative power of God. He then led students in a brief activity through the invention process to demonstrate that everyone has the ability to be an inventor. After his presentation, 86% of students answered yes or maybe to the comment, “Dr. Bornholdt’s discussion about connecting our inventiveness to that of God’s, helped me to see that I can invent.” Rosati-Kain physics teacher and robotics coach Lauren Lester plans to host Dr. Bornholdt again in the future as he continues to develop his presentation into a workshop format.” (Lauren Lester, Physics Instructor, Robotics Coach, \*FRC Team 5583, Scholar bowl coach.)

\*The FIRST Robotics Competition (FRC) is an international high school robotics competition. Each year, teams of high school students, coaches, and mentors work during a six-week period to build game-playing robots that weigh up to 120 pounds (54 kg).

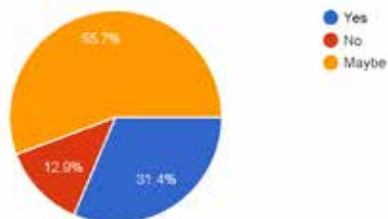
### Inventiveness

72 responses

***How to invent is a topic that interests me.***

70 responses

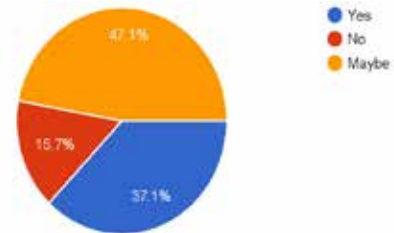
We didn’t have enough time in one class period to go



through the entire process of identifying an area of interest, defining a problem, and inventing a solution.

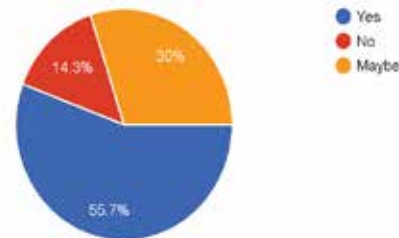
***Is this an activity you would be interested in spending more time on?***

70 responses



***Dr. Bornholdt’s discussion about connecting our inventiveness to that of God’s, helped me to see that I can invent.***

70 responses



***What did you find most interesting from Dr. Bornholdt’s discussion?***

68 responses

- The importance of engineers (2)
- Him asking us what we like to talk about. (2)
- At the end where we related it to things that can be improved
- When we talked about the relationship of God and inventing
- When we talked about the comparison of God and inventing
- Finding problems in our world
- We can invent anything
- I enjoyed that we got to be a part of the discussion and put our thoughts in. I liked how he incorporated religion and science together.
- I liked how he connected God creating things to humans using God’s creation to create more things.
- Different things we can invent; not just things to use but how we treat others
- Hard question that I didn’t know I could answer



## Exploring the Belief in the Real Presence

### Overview:

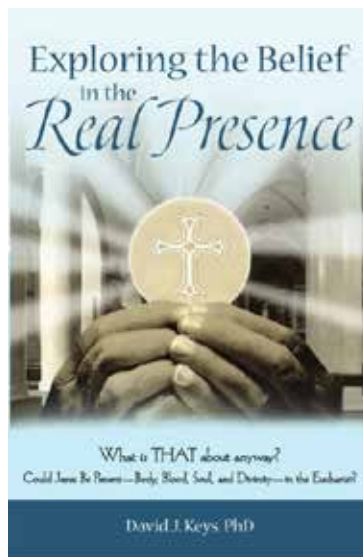
The Eucharistic celebration is an ancient ritual originating almost 2000 years ago. It took place during the last Passover supper which Jesus had with his apostles on the day before he died. At that time, Jesus took bread, blessed it, broke it, and gave it to the apostles, saying “This is my body.” Subsequently, Jesus took the wine, gave thanks and gave it to the apostles saying, “This is my blood.” Jesus commanded the apostles to “Do this in memory of me.”

Currently, the religions of more than three-fourths of the world’s Christians believe that when these same words are said during their faith’s Eucharistic liturgy, the bread and wine turn into the real presence of Jesus Christ, that is, into the body, blood, soul, and divinity of Jesus Christ. However, many individuals belonging to those religions which believe in the real presence have little understanding of the basis for this ancient belief.

In *Exploring the Belief in the Real Presence*, author Dr. David J. Keys provides an understanding of the real presence in the Eucharist for both newcomers to the principle and for those who wish to extend their belief to a deeper level. Through scripture, Church Teaching, and discussions of both Eucharistic miracles and Healing miracles of the Eucharist, Keys shares the beauty and richness of this ancient teaching concerning the real presence of Jesus in the Eucharist.

### What Readers have to say:

“I am aware of no other material that does as good a job in comprehensively telling the story of the miracle of God’s gift to us in the Eucharist. A must read for anyone doubting the real presence of God in the bread and wine changed into His body and blood. Christ called us His friends. Well done David. Thank you for sharing your many gifts with us. It is a must read for anyone wanting to know more about the real presence of God in the Eucharist” (L.S.)



“Well written in a very conversational tone. As an adult “revert” to my Catholic faith, I really appreciated this book which has deepened my understanding and belief in the Real Presence. I find myself drawn to a deeper reverence during the consecration of the bread and wine into the body, blood, soul, and divinity of Jesus during Mass. Three parts of the book were intriguing. 1) what seems irrational can be true. In his introduction, the author, a Phd in physics, uses easily understood scientific examples of truths that seem irrational to us. Reliable facts and evidence prove them true based on a preponderance of evidence that I can trust. 2) the author offers numerous examples from early Christians, who ALL, believed that Christ was truly present in the Eucharist. Finally, 3) the stories of a few of the many proven Eucharistic miracles, were icing on the cake. I highly recommend the book for the sincerely searching Christian, the agnostic, or the Catholic seeking to deepen his or her faith and experience at Mass.” (C.R.)

“Great book easy to read great reflection love this and would recommend to all Catholics!” (M.A.)

“Well written and very inspirational” (S.B.)

*“Personally, I can say that after being raised Catholic, I simply believed in the Real Presence out of a childlike faith. Then, one day, an evangelical minister asked me to explain why I believed in the Real Presence. The question eventually led me onto an eleven-year journey in which, ..I managed to obtain a master’s degree in theology and came to understand more fully the reasons for my belief in the Real Presence. This I wish to pass on to others as straightforwardly as I can, raising and answering objections along the way. In the end, I desire and hope that you also will gain a new perspective on your own understanding of the Eucharist, while coming to a greater understanding of the beliefs of your Christian brothers and sisters.”*

- David J. Keys, 2015.

## Where Have All The Elders Gone?

by Edward J. O'Boyle, PhD

Mayo Research Institute

*Permission to quote is granted when the source is acknowledged. October 1, 2018*

The current spectacle at the U.S. Senate Judiciary Committee hearings to advise and consent on President Trump's nomination of Brett Kavanaugh to sit on the U.S. Supreme Court as an associate justice raises many issues and questions regarding not just Kavanaugh's fitness to serve on the Court but our ability to govern ourselves. In the past several weeks we have seen organized outbreaks of anarchy and warning signs of tyranny in the halls of Congress challenging our democratic republic and constitutional rights.

One question in particular captures our attention. Where have all the elders gone? Those members of Congress who intervene when the rhetoric and posturing get out of hand. Who respectfully and privately tell their colleagues when they have crossed the line and are engaged in behavior that has the effect if not the intent of dividing Congress. Who understand full well that the work of Congress is to find ways to put aside personal ambition whenever necessary in order to reach agreement. Who hold fast to the truth that subduing personal ambition does not diminish the integrity of members of Congress but allows them to preserve and enhance their integrity by intelligent and free service to the good of all Americans.

Personal ambition in political affairs is the equivalent of self-interest in economic affairs. Both are driving forces but both are fraught with danger.

In economic affairs, excessive self-interest can destroy a market economy by opening the door to serious abusers. Consider the role played in the Great Recession by mortgage lenders who persuaded persons and families whom they knew were at risk of default to sign on to mortgages which in turn were bundled and sold to other financial institutions that were unaware of the underlying default risk baked into those bundles.

In political affairs, excessive ambition can destroy a representative democracy when one party is able, willing, and successful in denying the other party the opportunity to speak, be heard, and be respected. Wherein discourse is foreclosed by a prior decision to

concede nothing, by a refusal to listen, by an inherent claim by partisans that their firmly-held position alone is the true measure of justice. This all-too pervasive attitude is an expression of the excessive ambition of far too many members of Congress and exposes the will to power of the political leadership. This is how excessive ambition turns a peaceful movement into a self-righteous mob.

To be an elder does not require long years of service in Congress. What it demands is a willingness to act with courage, wisdom, and prudence. A special temperament that looks for opportunities to build consensus where no one loses and resists the toxic environment of "heads I win tails you lose." Those members of Congress whose careers prior to Congress were structured on winning at all costs, even when it meant denying someone his due, have to learn the ways of accommodation. Shaking hands and genuinely caring for others have to replace finger pointing and spitefulness. Failing that, what you get is the disgusting incivility of the Judiciary Committee hearings where some members are willing to turn witnesses into pawns for their own personal advantage.

Elders never use other persons to advance their careers or personal agendas. Elders never raise their voices to interrupt or intimidate others. They never refuse to listen to others. They resist responding in kind to a personal insult.

Rather than excluding others, elders invite them into the discourse. Elders understand and accept the consequences of at times putting the needs and interests of the nation ahead of their own districts and states. They know and resist extending Gresham's law from economics to politics wherein bad behavior drives out good behavior.

Elders embrace the proposition that a person accused of a crime is innocent until proven guilty is not a courtesy accorded the accused that can be cast aside whenever it

*Continues on page 11*

pleases the mob. Elders recognize that the presumption of innocence is essential to the sacred dignity of the accused. Shifting the burden of proof to the accused in a Congressional hearing is just one more way that the practice of identity politics deliberately demeans and uses a human being for partisan advantage and puts other like-minded persons at risk. Due process is due diligence where courage, wisdom, and prudence replace the fury of the mob as the proper means to discovering the truth.

Elders do not allow themselves, colleagues, staffers, partisan strategists or pollsters to use the media to parrot partisan talking points or to launch ad hominem attacks. Words matter. Lies and half-truths are inherently damaging to self-governance.

Media elders, especially on cable TV, must resist inviting partisan gunslingers to comment on current events even when leaving them off the schedule negatively impacts their ratings. Gunslingers are not there to dialogue. Driven by excessive ambition – notice how many of

them are young -- they were hired to attack and destroy. Their deadly gunplay has the effect of spreading the toxin of identity politics and further dividing the country. Elders at cable news channels should not have to be told that there is no place for re-staging *Gunfight at the OK Corral* in their programming. Words matter because words can kill.

We don't have an answer for the question "where have all the elders gone?" What we do know is that the future of representative democracy cannot be left in the invisible hands of the pursuit of personal ambition at all cost. It has to be left in the caring hands of men and women who know how to rein in personal ambition when it begins to fuel the fires of anarchy and tyranny. Self-governance is not an assured thing. It is a precious gift that requires eternal vigilance.

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### **CRISPR – The Gene-editing Tool “Par excellence.”**

“Few scientific breakthroughs have been as important as the discovery of the CRISPR/Cas<sub>9</sub> (clustered regularly interspaced short palindromic repeats) technique as a gene editing tool. CRISPR/Cas<sub>9</sub> is a natural system that provides bacteria with an adaptive response against viruses. In 2012, Jennifer Doudna and Emmanuelle Charpentier published a study in which they detailed how this system could be used to perform programmed gene editing in different cell types. Other gene editing techniques had previously been discovered, such as TALENs (transcription activator-like effector nucleases) or ZFNs (zinc finger nucleases). However, their complexity of use, high cost and poor or moderate efficacy has prevented their widespread application, even though good results had been obtained in some cases. The CRISPR/Cas<sub>9</sub> technique overcomes these three obstacles, so it has spread very quickly to laboratories around the world, relegating the former techniques to second place. Thus, the number of publications in this field is increasing rapidly. It seems fair to say that, with the discovery of CRISPR/Cas<sub>9</sub>, gene editing is here to stay.”

*(Cited from blog at Bioethics Observatory – Catholic University of Valencia  
info@bioethicsobservatory.org)*

## OPINION

### Joop Schopman

“...I often have the feeling that the emphasis on the two books, the bible and nature, is missing most of the present problems. The science of our days is no longer the (mathematical) science of the previous ages...It has become a major economic force and has lost most of its innocence. No longer is it truth which forms its horizon, but big money. In my opinion the science-religion issue is missing the still increasing dimension of the (political) reality. Other issues have become more important, and scientists tend to be naïve towards the role they are playing. ...[t]he issue is still at the center of my own concerns but the issues around it are growing increasingly complex, and thereby our responsibilities as well.”

## RESPONSE

### Tom Sheahan

“Joop Schopman is quite correct in pointing out the enormous influence of money! Many of my scientific colleagues recall “Eisenhower’s Farewell Speech” of January 1961, where he warned of the dangers of big money in science. The predictions Ike made have mainly come true over the intervening half-century. “Big Science” got rolling with the construction of very large particle accelerators, of interest in Particle-physics. But soon other things in “big science” developed and grew out of control. The effect of big-money programs has infected academia, so nowadays there is hardly any truly independent R&D going on any more. The individual explorer like Edison or A.G. Bell are long gone. In the biology/medical/pharmaceutical field, everything is “big science,” because it takes a few billion dollars to bring a new medicine onto the market. Currently, we’re seeing the same money-driven science in “climate change,” which has gone completely off the rails, with eminently reasonable skeptical scientists being shunned and denounced as “climate deniers””.

*We invite your responses/  
reflections on the topic*

## Joop Schopman Biography

*(In his own words)*

Trained as a science student in experimental atomic/molecular physics I was a member of the groups which tried to stress the connection between science and society; their reciprocal impact. Working originally in the department of philosophy (called then the central faculty) at the University of Utrecht, I used the claims of digital ‘intelligence’ to concentrate on the developments in the computer sciences. As a result, I had the opportunity to study the emerging field in Edinburgh U.K. and Stanford, USA. Gradually I shifted to the broader field of cognitive science, and still try to follow the current developments... from a distance... and while getting older!

*(From the Editor)*

After studies in philosophy and physics, the author worked in several laboratories. These experiences aroused his interest in the relationships between science, technology and society. Since 1982 he has focused on artificial intelligence (AI) and the cognitive sciences. In 1993, after many years at the University of Utrecht, he became Visiting Professor at the University of Innsbruck, Austria as well as at Boston College, U.S.A. His main publications are in history and philosophy of science, and in AI.

## Eisenhower on the Threat of Big Science: Ike’s 2nd critical warning.

*From The Daily Galaxy via Hank Campbell,  
American Council on Science & Health*

President Eisenhower surrounded himself with brilliant academics, he knew that science ended World War II without costing another million American lives, but by 1961 he also knew “we must also be alert to the equal and opposite danger that public policy could itself become the captive of a scientific-technological elite.”

He worried about that government control over funding would change the nature of the “free university, historically the fountainhead of free ideas and scientific discovery.”  
*(Excerpts from Hank Campbell blog, December 26, 2017.)*

## Why do Humans Try to Limit God?

by Thomas P. Sheahen

We are all familiar with the atheists' position that claims the "mantle of science" to buttress their claims. No matter what the specific details, the underlying argument asserts that "Science shows ..." or "Science proves ..." something negative about God. Most religious people are driven to silence by the claim of scientific authority; only those who have learned of the compatibility between science and religion will speak up and argue back.

The most important fact about science that needs to be recognized is that this entire form of knowledge is limited to the four dimensions of space and time. Science makes no statement that extends beyond those limits. Once it is acknowledged that there *are* realities that extend beyond the realm of space-time, science is no longer competent to referee discussions pertaining to such realities.

The atheists' position seeks to pre-empt that condition by arguing that there is NO reality outside of space and time, thereby asserting the pre-eminence of science over *all* possible knowledge. That position is known as *Scientism*, or *Scientific Materialism*. The "material" world is all there is. About 30 years ago, Carl Sagan articulated that outlook very succinctly.

Meanwhile, on our side, we say that God is *Transcendent*, but very few people actually grasp what that word means. Most people perceive space and time as "always there," the background in which all reality happens. The thought that space and time might be an entity that was specifically *created* by God is an incomprehensible foreign notion. There is a very widespread belief that God exists *within* space and time. That God is *beyond* or *outside of* space and time is something to which believers nod in assent, but usually cannot internalize.

The recurrence of questions of the form "What was God doing *before* He created the universe?" indicates how difficult it is for humans to imagine God being *independent of* space and time, *transcending* space and time. The point that God *created* space and time together was enunciated by St. Augustine around the year 400, and it's tucked away in the opening lines of Genesis; but people are generally unable to grasp the meaning of it. If we further state that God created General Relativity, Maxwell's Equations and Quantum Mechanics, that too will elicit a blank stare.

Regrettably, a lot of religious people accept the terms-of-debate proposed by the atheists, and then argue defensively in support of an image of God that is confined to within space-time. That image of God as some kind of super-human (typically depicted on the Sistine Chapel ceiling) sooner or later falls to the attack of *scientific materialism*. The atheists reject a *limited* God who is confined within space & time. The insight required to overcome *Scientism* is to reject the atheists' notion of that confinement in the first place.

### GOD'S CREATION AND OUR PERCEPTION

Why should anybody think that God is limited to only 4 dimensions? Posed in that form, our answer is "obviously not." But that's not just a rhetorical question, and the answer is not obvious. The underlying reality is that *all* of human culture and speech is confined within space-time. To *express* any thought, it's necessary to present it in some language, and every language has space and time at its core. Few people perceive any link at all between the 3 dimensions of space ( $x, y, z$  = sideways, back & forth, up & down) and the dimension of time. Indeed, treating time as a dimension, as well as the expression of *any* relationship or unity between space and time, comes from the late 19<sup>th</sup> century, and still is completely unfamiliar to the great majority of human beings. By today, physicists are accustomed to that linkage, but that wasn't the case a century ago.

In Lonergan's book *Insight*, he explains the various types of *bias* that impair the path to a higher level of understanding. Beyond *individual* Bias and *Group* Bias, which are correctible, the worst form is *General* Bias, where everyone holds the exact same paradigm, and there's no one around to correct it. Identifying that such a condition exists was a major step forward by Lonergan. In pre-Einstein days, space and time were *of course* regarded as separate; there was little to motivate any thought of linkage between them. The prevailing *General* Bias was that there were only 3 dimensions:  $x, y$  and  $z$ .

Over long periods of time, mathematics has contributed a great deal to overcoming General Bias. In every age,

*Continues on page 14*

scoffers would deride a concept as “impossible,” only to be overcome by an application of mathematics. Ancient large buildings, aqueducts and other trappings of civilization came about that way. Observations of the motion of planets led through consecutive stages of astronomy, culminating in Newton’s laws and *Classical Mechanics*. At the close of the 19th century, existing physics predicted the *Ultraviolet Catastrophe*, an obvious indication that something must be wrong; in 1900 Max Planck introduced the entirely new concept of the *quantum* as a means of correcting that problem. The 20th century history of *Quantum Mechanics* and its countless applications has transformed civilization. Mathematics has been on the forefront for the entire journey.

Mathematics also teaches us that it’s possible to work in multiple dimensions, far more than merely space and time. To assert that there *are* other dimensions is nothing exceptional. To assert that God *created* such additional dimensions makes perfectly good sense to anyone open to religious faith. However, we must realize that we humans *are* very limited in our ability to think about and discuss such dimensions, since we have to trammel all expressions into some specific language, embedded in a specific culture. Mathematical representations can be very helpful in overcoming such limitations – provided all parties to a discussion agree on the meaning of terms. In the particular case of *Scientific Materialists*, they won’t agree to the basic premise of more dimensions than space and time, so further discussion is cut off.

In theoretical physics, more dimensions are routinely employed. In the branch of physics known as *string theory*, there are models that use variously 26 or 11 or other dimensions, and we use the term “rolled up” to express that those dimensions are inaccessible to our measurement instruments. The elegance of the mathematics of such models is the principal argument for believing that physics behaves according to *string theory*. Opposing that, a fair fraction of physicists are dismissive of *string theory*, because it doesn’t make any measureable predictions. Separately, there is one fully respectable theory that regards General Relativity as the 4-dimensional projection of a 5-dimensional reality. The relevant point for the present topic is that extra dimensions should not be forbidden, but are entirely plausible.

At present, we have no meter stick or clock with which to

quantify any additional dimensions, but that is a limit of human ingenuity, not a limit upon the Creator. Without a numerical calibration, the term “dimension” loses its sense of precision, and therefore many people prefer the more general term “additional *degrees of freedom*.” Either way, the point to be stressed is that additional dimensions are distinctly different from one another, just as “sideways” is distinct from “up-down.” In the absence of readily-relatable concepts (such as up-down), we have difficulty identifying the difference between consecutive dimensions, but that difficulty certainly does *not* imply that they must be reduced to the limited domain of space and time.

Striving for such reductionism leads to terribly limited outcomes. For example, studies of the human mind that yield measurement of voltage or other parameters within space-time are a good example of that. Stepping beyond the boundaries of empirical science is often the best way to deal with higher degrees of freedom. Upon doing so, it is important to explicitly recognize where that boundary is, and acknowledge stepping across it.

### STEPPING INTO HIGHER DIMENSIONS

Let us begin by assuming that God created many dimensions in addition to space and time: 7, 17, 73, 128, a million? Of course that is unknown to us. But the idea that we advance over time and gain access to more and more dimensions is plausible. In physics it can be shown how very simple atoms advance from a single dimension to the 4 dimensions of space-time.

Other scholars have speculated along such lines. Pierre Teilhard de Chardin explored the notion of *complexification*, in which evolving reality marches through consecutive layers of increasing *consciousness*. That is certainly an approach eligible for consideration.

We can cordon off a dozen dimensions for *string theory*, and proceed further. Inanimate rocks seem to be well-explained by physics within space-time, but when thermodynamic systems develop, there is the additional presence of *information*, which affects order and disorder. (Think of moving fluids, or *weather*.) In this way, extra dimensions come into play. Self-organizing molecules access yet a higher reality. Anything that is alive is still more complex. Moving upward and branching through

*Continues on page 15*

vegetation and animals, even more dimensions appear as cognizance grows. Animals demonstrably have memory, a property that far exceeds inanimate matter. The descriptor “degrees of freedom” or “dimensions” is appropriate for such consecutive improvements.

Coming to mankind, we find many characteristics that far exceed the capabilities of even advanced animals: intellect and free will come immediately to mind. Looking across history, we can see the development of specialization in agriculture, civilization, up through art and music, and beyond. It would be terribly presumptuous to think that contemporary mankind completes the upward progression. God certainly has additional dimensions “out there” that we haven’t accessed.

In his model of increasing *complexification*, Teilhard perceived the occurrence of physical death as one step in the progression into higher realities, in which we somehow become *more than* human beings. The step of dying is disappointing to some, but readily accepted by others. His picture may not be true, but it’s not necessarily false, either. The conclusion that stands out is that humans progress through consecutive new levels, whether they be called *dimensions* or *degrees of freedom* or any other descriptive term.

## CONCLUSION

When we insist upon God’s freedom to create whatever He wishes, in whatever way or by any mechanism He chooses, we are directly confronting and rejecting the atheists’ limited vision of only the 4 dimensions of space & time. If they hold a picture of a god confined within space-time and want to disbelieve in that, we say “OK, fine with us.” We believe in a far more powerful and versatile God, who *transcends* the limits of space and time.

It is the evidence of science that *points to* that transcendent God. Aided by the higher properties of the human mind, we are able to comprehend that our science is limited within space and time, and is only able to *point* beyond science. We follow the strong evidence that there is much more to reality, which leads us to the very reasonable conclusion that God’s creation encompasses much that we are unable to perceive.

God is the Creator of all things visible and invisible.

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## What Catholic Scientists Expect of The Church

By Dr. David J. Nagel

*Research Professor, School of Engineering and Applied Science at The George Washington University, Washington, DC*

*As the Editor was perusing archival files, she came across the following piece from the ITEST bulletin of 1983, Volume 14, Number 4. Published as excerpts from the longer paper prepared for the ITEST conference on “The Role of Christian Men and Women in Science in the Mission of the Church,” Dr. David J. Nagel discusses “What Catholic Scientists Expect of the Church.” It might surprise our readers that some of the questions he poses in this essay are still pertinent today.*

The title of this paper is probably misleading since it implies that some survey of Catholic scientists has been made concerning what they expect of the Church. Not so! A more accurate title would be: What Catholic scientists might expect of the Church. But, actually the paper is about this: What one Catholic scientist has come to want from the Church once he stopped to think about it. Some personal and, hopefully, rational motivations for considering the subject are cited in the next paragraphs...

This topic of the overlap between technical and

theological matters, and what to do about it, can be compelling for both individual and logical reasons. For me, the initial motivation was something of a sense of responsibility. God created a delightful universe which is a pleasure to study. Are we as scientists to be content with the individual satisfactions of our intellectual pursuits and their associated social aspects, such as attendance at technical conferences, correspondence with other scientists and the like? Or, do we have an obligation to use our special position in a way which will “return to God”

*Continues on page 16*

some of what we are privileged to do and learn? If we are teachers, as well as researchers or technologists, there is a more demonstrable “payback” than is the case for routine publication of new results. However, even teachers may be able to participate more fully in the intellectual life of the Church in technical areas in which they do research or technical development.

Most Catholic scientists suffer from a separation of Church and Science. That is, each of us is but one person with what seems like two lives, one religious and the other technical.

Sundays there is little attention to technical matters. When was the last time you heard a substantive discussion of a topic heavily dependent on science or technology from the pulpit? Discussions of religion in any manner are also rare “at work”, let alone talk of the impact of current research on religion. Some topics tend to generate discussion more than others, but generally there is only random and infrequent discussion of religious matters in the laboratory because of the press of work and fear of offending colleagues. In short, there is too much of a tendency for the individual Catholic scientist to have one view when he looks toward the Church and another when he looks toward the Scientific Community. He cares deeply about both. What is the hope for more routine integration of the two arenas?

The point is this: while at one time the Catholic Church was the repository of the world’s knowledge, and while it has had ample time to assimilate, consider and provide guidance on the morality and ethics of action in areas influenced by technical matters, the response time of the Church is no longer short compared to the rate of change of science and technology.

Another way to appreciate afresh the growing importance of technical matters in the modern world is to consider some of the issues hotly discussed in recent decades. Nuclear weapons, nuclear power and environmental impact of industrial processes have been of major concern in the United States. These issues will not be put aside in the foreseeable future...

Looking ahead in other areas, genetic engineering has clear impact on the teachings of the Church. Consider

the natural law in light of the current ability to transfer DNA between species and pass it on from generation to generation. The recent attention to genetic engineering of the human germ line is another barometer of the questions already at hand, questions which will press upon the Church hierarchy...

There must be improved communication on technical matters from Catholic scientists to the hierarchy and on theological, moral and related matters from the Church to its scientists and members at large. The first step could be to simply identify those who are to communicate. Who are the Catholic scientists with particular areas of expertise and the desire to participate more fully in the intellectual life of the Church? Those of us who do research full time often do not know who among our colleagues is Catholic, once we go past the limits of our immediate groups. Jewish scientists do vastly better in knowing each other and taking advantage of their common viewpoints. Is there some way in which to survey Catholics and/or scientists in order to identify the men and women who have the qualifications and desire to contribute in a responsive manner to the Church? On the Church side, who are the cardinals and bishops who are specially interested in the impact of science and technology on the present and future Church?

Expectations may also include the hope that the Church would revel in the joys of science and technology. The deep feelings associated with Catholicism are most satisfying. So are the deep feelings engendered by the processes and results of research. It has been said that failure is the dominant experience in science. Indeed, many experiments do not work. But, the struggles slip from mind and the sweet successes remain. The intense pleasure of discovery, and of the admiration of God’s handiwork, are very akin to the joys of religion.

In summary, it seems that both scientists and the Church would benefit from better use of the special knowledge of Catholic scientists by the Church.

*“I believe that scientists need the church in order to be relevant. That is the great opportunity for the Christian scientists.”*

- Dr. John Matschiner 1983