

**KEEPING SCIENTIFICALLY INFORMED:  
A DUTY FOR THEOLOGIANs AND  
THE CHURCH MAGISTERIUM**

JAME SCHAEFER  
*Marquette University  
Milwaukee, Wisconsin*

*Designee of the Catholic Theological Society of America  
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Laudato Si': Science, Responsibility, & Solidarity  
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Continuing to probe “The Theological Enterprise in Light of the New Evangelization,” the bishops who comprise the USCCB’s Committee on Doctrine<sup>1</sup> chose to focus this workshop on issues pertaining to Pope Francis’ 2015 encyclical, *Laudato Si’: On Care for Our Common Home*.<sup>2</sup> They invited six Catholic societies<sup>3</sup> to explore with them the theological underpinnings of the encyclical and how its publication has affected both theological reflection and church practice. They identified three major areas of inquiry—Church Teaching and the Natural Sciences, Human Responsibility for the Natural World, and The Effects of Technology on Solidarity Within the Human Community, assigned each society to one of these areas, and asked the societies to designate scholars who would prepare answers to specific questions.

The bishops tasked the CTSA with answering the following questions pertaining to Church Teaching and the Natural Sciences:

1. How do the findings of the natural sciences enter into theological reflection?
2. How do the findings of the natural sciences enter into church teaching?
3. How is the authority of church teaching involving these matters to be evaluated?

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<sup>1</sup> Who We Are, Committee on Doctrine, United States Conference of Catholic Bishops, <https://www.usccb.org/committees/doctrine/who-we-are>.

<sup>2</sup> Francis, *Laudato Si’* (May 24, 2015), [https://www.vatican.va/content/francesco/en/encyclicals/documents/papa-francesco\\_20150524\\_enciclica-laudato-si.html](https://www.vatican.va/content/francesco/en/encyclicals/documents/papa-francesco_20150524_enciclica-laudato-si.html).

<sup>3</sup> Catholic Theological Society of America, Academy of Catholic Hispanic Theologians, Academy of Catholic Theology, Black Catholic Theological Symposium, College Theology Society, and Fellowship of Catholic Scholars.

They explained that they asked these questions because Pope Francis has been criticized for speaking on scientific matters about which the church has no particular competence.

President María-Pilar Aquino asked me, on behalf of the CTSA's "line of presidents," to respond to the bishops' questions from my perspective as a systematic theologian and ethicist who has been researching, writing, and teaching about constructive ways in which to engage scientific findings in theological discourse and discerning how we should be functioning with one another, other species, and systems of Earth for our mutual flourishing. Following are my responses to the bishops and recommendations I urged them to consider when concluding their deliberations.

### MY PRESENTATION

Thank you, bishops, for asking these important questions and welcoming answers from our scholarly organizations. You honor us by engaging our research findings and reflections in your work.

When answering your questions, I want you to know that I view myself as serving the church. I fully recognize you and all bishops together as the teaching authority of the church. You speak *for* our church when expressing, clarifying, and applying our faith, whereas we academicians speak *from* the church as investigators and interpreters of her rich theological traditions.

#### *How do the findings of the natural sciences enter into theological reflection?*

The natural sciences *inform* our theological reflections about God, the Universe, Earth, the human person, and all constituents of Earth. The natural sciences do not dictate our faith. They help us express our faith cogently to yield deep meaning today for how we think about God and our relatedness to one another as human persons, to species, to ecological systems, and to the biosphere.

As a systematic theologian who studies how doctrines have been reflected upon over the centuries within different contexts and from different understandings of the world, I know that basic discoveries by natural scientists are important for expressing our faith today. The natural sciences—physics, biology, chemistry, neuroscience—are especially important when we are reflecting on the doctrine of creation, the human person as *imago Dei*, and God's activity in relation to the world. The natural sciences are also crucial for helping us make informed decisions about how to act on issues that are occurring today and predicted to occur in the future.

When opening to the natural sciences, theologians need to be aware of the distinctions between theology's ways of knowing that are grounded in our faith in God and the natural sciences' ways of knowing that are grounded in the world God made possible. This requires recognizing that natural scientists rely on different data, follow different methods of inquiry, ask different questions, and function within defined scopes that vary from our purview as theologians.

Faith in God remains constant when theologians are informed by the natural sciences. Scientific findings help us think about God in ways that make sense using our limited language to talk about the Subject of our worship.

Informed by basic scientific findings, theologians can engage variously in discourse about God and God's activity in relation to the world: God as having empowered the universe to emerge over 13.75 billion years; God as actively sustaining the world's internal flourishing; God as freedom-giving to the world to become itself without interference in its natural development; God as generous by fueling the dynamic development of a diversity of inanimate to animate creatures through the cosmic to biological evolutionary process; and, God as patient by waiting for the emergence of intelligent creatures who can open to experiencing God's presence in the world, discerning characteristics of God through the world, and choosing to act responsibly in relation to other biota and abiota out of love for God who lovingly made all possible.<sup>4</sup>

We admit that our language is inadequate to the task because our Subject is beyond our ability to fully comprehend and express in words. However, we continue to try.

I was delighted to discover that my efforts to engage in theological discourse informed by the natural sciences comply with Saint John Paul II's encouragement throughout his pontificate (1978-2005). The earliest was in 1979 when he expressed his appreciation for "pure science" and proceeded to amplify the importance of science when expressing our faith.<sup>5</sup> One of my favorite examples appears in a statement he issued in 1992 when explaining lessons learned from the church's unfortunate encounter with Galileo Galilei in the seventeenth century:

It is a duty for theologians to keep themselves regularly informed of scientific advances in order to examine, if such be necessary, whether or not there are reasons for taking them into account in their reflection or for introducing changes in their teachings.<sup>6</sup>

Some of my students' grandparents are relieved to know that I have official papal encouragement for relating theology and the natural sciences in my courses at Marquette University!

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<sup>4</sup> As Basil of Caesarea wrote in *Hexaemeron* 6.11: "He who has granted us intelligence to learn of the great wisdom of the artificer from the most insignificant objects of creation permit us to receive loftier concepts of the Creator from the mighty objects of creation.... Truly it is not possible to attain a worthy view of the God of the universe from these things, but to be led on by them, as also by each of the tiniest of plants and animals to some slight and faint impression of Him." Many patristic and medieval theologians reflected on God's 'book of nature' as the medium through we experience God's presence and manifestations of God's character—especially God's goodness, power, and wisdom as explored in Jame Schaefer, *Theological Foundations for Environmental Ethics* (Georgetown University Press, 2009), 65-102.

<sup>5</sup> Pope John Paul II, "Faith, Science, and the Search for Truth," *Origins* 9 (November 29, 1979), 389-392: "Pure science is a good, worthy of being and well loved, for it is knowledge and therefore perfection of man in his intelligence. Even before its technical applications, it ought to be honored for itself as an integral part of culture. Fundamental science is a cultural good, which all people must cultivate in full liberty."

<sup>6</sup> Pope John Paul II, "Lessons of the Galileo Case," *Origins* 22 (November 22, 1992), 371-374. Therein, he quoted Pope Leo XIII's statement, "truth cannot contradict truth," in *Providentissimus Deus* (18 November 1893), 23, [http://www.vatican.va/content/leo-xiii/en/encyclicals/documents/hf\\_l-xiii\\_enc\\_18111893\\_providentissimus-deus.html](http://www.vatican.va/content/leo-xiii/en/encyclicals/documents/hf_l-xiii_enc_18111893_providentissimus-deus.html).

Again, in answer to your first question, the natural sciences *inform* theological discourse to provide cogent and meaningful ways of thinking about God, the world, the human person, other creatures, and systems of Earth. The natural sciences also provide information that is vital for discerning actions that our faith in God requires.

### ***How do the findings of the natural sciences enter into church teaching?***

Many of you are theologians and all of you have a much graver responsibility than mine. You are invested with the responsibility of clarifying and reminding us of our faith and urging us to demonstrate our faith. Keeping yourselves informed about scientific findings is essential so you can express the Catholic Christian faith in the complex and sometimes foreboding contexts of times in ways that make sense from our understanding of the world and urge us to act on issues warranted by our faith.

Though this meeting was apparently prompted in part by criticisms that Pope Francis referred to scientific and other knowledge in his 2015 encyclical, *Laudato Si', On Care for Our Common Home*, allegedly for which he lacks expertise, the imperative for the magisterium of the church to keep abreast of scientific findings was well established long before he became pope. I just mentioned Pope Saint John Paul II's exemplary efforts during his pontificate. In his teachings and actions, he built upon earlier efforts by his predecessors—Leo XIII, Pius IX, Pius XI, and Paul VI.<sup>7</sup> Thus, I

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<sup>7</sup> Pope Leo XIII established the Vatican Observatory in 1891 “so that everyone might see clearly that the Church and her Pastors are not opposed to true and solid science, whether human or divine, but that they embrace it, encourage it, and promote it with the fullest possible devotion.” Papal Documents, Church and Science Today, Vatican Observatory Foundation, <https://www.vofoundation.org/faith-and-science/church-and-science-today/papal-documents/>; Leo XIII, *Ut Mysticam* (14 March 1891).

Building upon the Frederico Cesi's founding of the Academy of the Lynxes in Rome in 1603 as the first scientific academy in the world, Pope Pius IX established the Pontifical Academy of the New Lynxes in 1847. Pope Pius XI reconstituted it as the Pontifical Academy of Sciences in 1936 for the purpose of advances the sciences—an endeavor that he considered “praiseworthy” and “noble work...in favour of the truth.” Who Are We: Origins, Vatican Observatory, <http://www.vaticanobservatory.va/content/specolavaticana/en/who-are-we/history/origins.html>.

Pius XI also equipped the Vatican Observatory with new modern instruments and moved it to Castel Gandolfo, installed a radio station in Vatican City that he used for pastoral purposes, and promoted faith-science dialogue when Positivism was advancing rapidly. He wanted the refounded Pontifical Academy of Sciences to be the “Scientific Senate” of the church and insisted that “science, when it is real cognition, is never in contrast with the truth of the Christian faith.” The Pontifical Academy of Sciences, <http://www.pas.va/content/accademia/en.html>; Pius XI, *In Multis Solaciis, De Pontificia Academia Scientiarum*, (October 28, 1936), [https://www.vatican.va/content/pius-xi/la/motu\\_proprio/documents/hf\\_p-xi\\_motu-proprio\\_19361028\\_multis-solaciis.html](https://www.vatican.va/content/pius-xi/la/motu_proprio/documents/hf_p-xi_motu-proprio_19361028_multis-solaciis.html); The Academy as the Scientific Senate of the Holy See, The Pontifical Academy of Sciences, <http://www.casinapioiv.va/content/accademia/en/magisterium.html>.

When speaking to the Secretary-General of the Conference on the Environment in 1972, Pope Paul VI questioned: “[H]ow can we ignore the imbalances caused in the biosphere by the disorderly exploitation of the physical reserves of the planet, even for the purpose of producing something useful, such as the wasting of natural resources that cannot be renewed; pollution of the earth, water, air and space, with the resulting assaults on vegetable and animal life? All that

am puzzled that Pope Francis was criticized for his engagement with the natural sciences in his epochal encyclical. Furthermore, he was quoting throughout *Laudato Si'* the many statements issued over the last few decades by his fellow bishops throughout the world who shared scientific observations about the threats to species and the degradation of biological regions within which their dioceses are situated.<sup>8</sup>

Saint John Paul II contributed significantly to developing a conscientious approach through which the magisterium of the church should value the natural sciences and their roles in relation to the Christian faith. He explained the purviews of the natural sciences, philosophy, and theology and emphasized their distinct contributions to issues at the boundaries of their disciplines. In 1992, when addressing the Pontifical Academy of Sciences, he underscored the “points of contact” that the natural sciences have with church teachings about the human person and the physical world. Science and theology are, he wrote,

[T]wo realms of knowledge, one that has its source in revelation and one that reason can discover by its own power. These two realms of knowing ought not to be understood as opposition. Nor are they altogether foreign to each other; they have points of contact. The methodologies proper to each make it possible to bring out different aspects of reality.”<sup>9</sup>

In his 1996 Message to the Pontifical Academy of Sciences, when its members had been studying the origins of life and biological evolution, Saint John Paul II again underscored the distinct roles of theology (to reflect on the human relation to God and the moment of transition to the spiritual soul), biology (to study the many manifestations of life with increasing precision correlated to timeline), and philosophy (to analyze and reflect on self-awareness, moral conscience, freedom, and religious experience). He affirmed the rightful role of the sciences when exploring the human

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contributes to the impoverishment and deterioration of man’s environment to the extent, it is said, of threatening his own survival. Finally, our generation must energetically accept the challenge of going beyond partial and immediate goals in order to prepare a hospitable earth for future generations.” Message of His Holiness Paul VI to Mr. Maurice F. Strong, Secretary-General of the Conference on the Environment (1972), [http://www.vatican.va/content/paul-vi/en/messages/pont-messages/documents/hf\\_p-vi\\_mess\\_19720605\\_conferenza-ambiente.html](http://www.vatican.va/content/paul-vi/en/messages/pont-messages/documents/hf_p-vi_mess_19720605_conferenza-ambiente.html).

<sup>8</sup> A brilliant pastoral approach by Pope Francis that follows the SEE - REFLECT/JUDGE - ACT method common in Catholic Social Teaching and Society of Jesus documents (e.g., Task Force on Ecology, *Healing a Broken World*, Special Report on Ecology, *Promotio Iustitiae* 106 (2011/2), Society of Jesus, [https://issuu.com/sjssj/docs/healing\\_a\\_broken\\_world](https://issuu.com/sjssj/docs/healing_a_broken_world)).

<sup>9</sup> John Paul II, “Lessons of the Galileo Case,” *Origins* 22.22 (November 12, 1992), 12. I can attest to experiencing these “points of contact” when team teaching with a physicist on the origin and nature of the universe six times, team teaching with another physicist and a social scientist on energy use and human-induced climate change and engaging evolutionary and molecular biologists and neuroscientists in my religion, science, and ethics course. We recognized and respected one another’s purviews and how together our disciplines contributed to a more comprehensive understanding of the topic, the significance of the human place in the world, and human responsibility to God for demonstrating our faith.

body as it emerged through the evolutionary process, whereas theologians rightfully reflect on the moment of transition to the “spiritual soul.”<sup>10</sup>

Both ways of knowing—theological and scientific—about the human may never exhaust the subjects of their focus. However, when working together, theology and the natural sciences can yield a more comprehensive understanding of the human person than only one way of knowing is capable.

The USCCB recognized the distinctive role the bishops were playing when addressing the phenomena of global climate change in 2001. You admitted you were not scientists or policy makers, but you entered the debate and accepted “the consensus findings of so many scientists and the conclusions of the Intergovernmental Panel on Climate Change (IPCC) as a basis for continued research and prudent action.”<sup>11</sup> You were offering wisdom—as you should and as we, the faithful, need—for why we should be informed by the natural sciences and why responsible actions should be taken at all levels of governance to address this threat to the flourishing of our common home.

Vatican II, the *Catechism of the Catholic Church*, and the International Theological Commission also encouraged awareness of and appreciation for the natural sciences. Both concluded that faith and science do not conflict and urged the location of the sciences within our Christian vision of God’s creation.<sup>12</sup>

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<sup>10</sup> John Paul II, “Message to Pontifical Academy of Sciences on Evolution,” *Origins* 26.22 (14 November 1996). The pope underscored the need for theologians to recognize well-established scientific knowledge that has significance for theological discourse. In #2, he taught: “In the domain of inanimate and animate nature, the evolution of science and its applications gives rise to new questions. The better the church’s knowledge is of their essential aspects, the more she will understand their impact. Consequently, in accordance with her specific mission she will be able to offer criteria for discerning the moral conduct required of all human beings in view of their integral salvation.”

<sup>11</sup> United States Conference of Catholic Bishops, *Global Climate Change: A Plea for Dialogue Prudence and the Common Good* (June 15, 2001), <https://www.usccb.org/resources/global-climate-change-plea-dialogue-prudence-and-common-good>.

Second Vatican Council, *Gaudium et Spes*, [https://www.vatican.va/archive/hist\\_councils/ii\\_vatican\\_council/documents/vat-ii\\_const\\_19651207\\_gaudium-et-spes\\_en.html](https://www.vatican.va/archive/hist_councils/ii_vatican_council/documents/vat-ii_const_19651207_gaudium-et-spes_en.html).

#36: “[M]ethodical research in all branches of knowledge, provided it is carried out in a truly scientific manner and does not override moral laws, can never conflict with the faith, because the things of the world and the things of faith derive from the same God. The humble and persevering investigator of the secrets of nature is being led, as it were, by the hand of God in spite of himself, for it is God, the conserver of all things, who made them what they are.”

*Catechism of the Catholic Church*, [https://www.vatican.va/archive/ENG0015/\\_INDEX.HTM](https://www.vatican.va/archive/ENG0015/_INDEX.HTM). #283: “The question about the origins of the world and of man has been the object of many scientific studies which have splendidly enriched our knowledge of the age and dimensions of the cosmos, the development of life-forms and the appearance of man. These discoveries invite us to even greater admiration for the greatness of the Creator, prompting us to give him thanks for all his works and for the understanding and wisdom he gives to scholars and researchers.”

International Theological Commission, “Communion and Stewardship: Human Persons Created in the Image of God” (July 23, 2004), [http://www.vatican.va/roman\\_curia/congregations/cfaith/cti\\_documents/rc\\_con\\_cfaith\\_doc\\_20040723\\_communion-stewardship\\_en.html](http://www.vatican.va/roman_curia/congregations/cfaith/cti_documents/rc_con_cfaith_doc_20040723_communion-stewardship_en.html). #66: “In exercising their stewardship of knowledge, theologians have the responsibility to locate modern scientific understandings within a Christian vision of the created universe.”

Thus, I have answered your second question about how the natural sciences have and should enter into church teachings. Now I respectfully ask you to consider three recommendations when culminating your deliberations after this workshop:

1. Become an **advocate** of the quest for scientific information—encourage and affirm the quest for knowledge about God’s creation. In this role, you are not confirming scientific findings because confirming them does not fall within your purview. Instead, you are confirming the *search* for scientific knowledge that may help you teach about our faith in cogent, meaningful ways.
2. Establish a **scientific panel** to (i) alert you to scientific findings, (ii) meet periodically on issues at the boundaries of doctrine/faith and science, and (iii) provide scientific clarity that can inform magisterial discourse. To identify scientists who are eminently qualified to serve, consider asking the American Association for the Advancement of Science to request its Dialogue on Science, Ethics, and Religion to recommend highly qualified scientists for you to invite.
3. Initiate within your **seminaries** and in **continuing education of priests** opportunities to become informed by the natural sciences and to probe their significance for preaching and teaching our faith in ways that make sense to an increasingly educated “people in the pews.” Our priests need basic scientific knowledge about God’s creation. Our priests need to be ecologically informed so they can help the faithful discern how to respond morally to human-forced climate change and other complex issues.

***How is the authority of church teaching involving these matters to be evaluated?***

Church teachings informed by scientific findings are best evaluated (i) by their cogency in reflecting the contexts of times and understanding of the world, (ii) by the depths of the meaningfulness that you convey, and (iii) by the behavior in which the faithful are motivated to demonstrate their faith. Evaluations can occur concurrently at parish, diocesan, and national levels and shared during listening sessions.

Thank you for listening. I welcome your insights and clarifying questions.