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THE GOD DEBATE AND THE LIMITS OF REASON

Gennady Shkliarevsky

ABSTRACT: There is a growing realization of the need to promote a constructive dialogue between science and religion both in the scientific and the religious community. Accommodationism based on the concept of nonoverlapping magisteria (NOMA) is arguably the dominant trend in the effort to achieve this goal. Yet despite the fact that accommodationism has many supporters, it has so far failed to promote a productive engagement between science and religion. The article argues that such engagement requires a critical re-examination of the principal tenets, self-evident truths, and intuitions by both the scientific and the religious community. It further argues that despite isolated efforts seeking to promote such re-examination in both domains, neither the scientific nor the religious establishment shows much willingness to pursue this course. Rather they prefer to follow a conservative agenda and impose limits on reason that are designed to protect the status quo.

KEYWORDS: Accommodationism, NOMA, dialogue between science and religion, John Paul II, Benedict XVI, Stephen Gould.

Metaphors conveying adversity, contention, and rivalry are abundant in the literature on the relationship between science and religion.¹ Words like struggle, warfare, and conflict are common currency. Reductions of the long history of the relationship between science and religion to few well-known episodes that justify this script are

¹ See, for example, John W. Draper, *History of the Conflict Between Religion and Science*, London, Kegan, Paul, Trench, Thrubner, 1874; Barbara Forrest and Paul R. Gross, *Creationism's Trojan Horse: The Wedge of Intelligent Design*, New York, Oxford University Press, 2004; Philip Johnson, *Darwin on Trial*, Downer's Grove, Illinois, Intervarsity Press, 1993; Edward J. Larsen, *Summer for the God's: The Scopes Trial and America's Continuing Debate over Science and Religion*, Cambridge, Harvard University Press, 1997; Henry Morris, *The Long War Against God: The History and Impact of the Creatio/Evolution Conflict*, Green Forest, Arkansas, Master Books, 2001; Wade Rowland, *Galileo's Mistake: A New Look at the Epic Confrontation between Galileo and the Church*, New York, Arcade, 2001; Bertrand Russell, *Religion and Science*, New York, Oxford University Press, 1997; Andrew Dickson White, *A History of the Warfare of Science with Theology in Christendom*, New York, Prometheus Books, 1993.

numerous. The persecutions of Giordano Bruno and Galileo, controversies over Darwin's theory of evolution, the Scopes Monkey Trial, and more recent clashes over stem cell research, abortion, teaching Creationism, Young Earth and Intelligent Design are widely used references.

By contrast, however, the empirical evidence about the relationship between science and religion points to a reality that is far more complex than the all-too-familiar narrative of conflict. Instances of hostilities are no more common than examples of mutual tolerance and even productive cooperation. An overview of interactions between science and religion reveal an array of various combinations when tensions between individuals, ideas, and institutions have either resulted in conflict or "have been resolved into harmony."² Stephen Gaukroger, for example, points to the period in early modern history when Christianity took over, promoted, and set the agenda for natural philosophy that advanced the cause of science in the 17th century.³

Although the narrative of warfare between science and religion still remains popular and clashes between science and religion do occur, there is a growing trend among adepts of both science and religion to look for more cooperative ways of engaging each other. As one author has noted, "recent academic writing on the subject [of religion and science] has been devoted primarily to undermining the notion of an inevitable conflict."⁴ The proponents of cooperation between science and religion represent a very diverse group with many perspectives and opinions that encompass different modes of interaction that range from complete independence, to mere compatibility, to full integration. For lack of a better choice, I would like to use a descriptive, if somewhat awkward, term "cooperationists" and its derivatives to characterize this group.

The cooperationists include some of the most visible scientific and religious institutions, as well as prominent scientists and church leaders. Among the religious institutions supporting cooperation are the Catholic Church, the General Assembly of the Presbyterian Church, and the Central Conference of American Rabbis to name just a few. Both Pope John Paul II and Pope Benedict XVI have been very passionate advocates of harmony between religion and science.⁵

² Thomas Dixon, *Science and Religion—A Very Short Introduction*, Oxford, Oxford University Press, 2008.

³ Stephen Gaukroger, "Science, Religion and Modernity.," *Critical Quarterly*, vol. 47, no. 4 (Winter 2005), p. 9.

⁴ Dixon, *Science and Religion*, Oxford, Oxford University Press, 2008, p. 2.

⁵ "Faith, Reason and the University," *Vital Speeches of the Day*, vol. 72, no. 25 (November 2006), pp. 706-710; John Paul II, "Fides et Ratio," Encyclical Letter (September 15, 1998),

On the scientific side, supporters of cooperation include such major organizations as National Academies of Sciences and a good number of eminent scientists, including some Nobel laureates.⁶ The National Academy of Sciences (NAS), for example, has urged accommodation in one of its most authoritative statements on the subject of evolution and creationism. Alluding to radicals who consider science and religion to be totally incompatible, both on the religious and the scientific side, the statement emphasizes: “Attempts to pit science and religion against each other create controversy where none needs to exist.”⁷ Some of the most prestigious scientific publications, including magazines *Nature* and *Science*, have prominently featured articles by advocates of cooperation. Finally, there are numerous publications that seek specifically to bring science and religion closer together, such as *Zygon*, *Theology and Science*, *Science and Christian Belief*, *Perspectives on Science and Christian Faith*, and others.

There is no doubt that support for close relations between science and religion has been gaining momentum. Critics, however, argue that such cooperation, while politically expedient, is intellectually dishonest and unsustainable. A rhetorical question from one of the so-called new atheists Mano Singham reflects the views of many scientists who have critiqued cooperationist: “After all, if we concede without argument that mainstream religious beliefs are compatible with science, how can we argue that witchcraft and astrology are not?”⁸ The enfant terrible of new atheism, Richard Dawkins, has referred to the cooperationist position of the scientific establishment as a hypocritical and cowardly “cop-out.” “I think,” he writes, “it’s an attempt to woo the sophisticated theological lobby and to get them into our camp and put the creationists into another camp. It’s good politics. But it’s intellectually disreputable.”⁹

The doubts expressed by the new atheists certainly raise questions about the prospects for cooperation between science and religion. Is it possible to eliminate tensions and achieve harmony in their relations? And if it is possible, what is the way

http://www.vatican.va/holy_father/john_paul_ii/encyclicals/documents/hf_jp-ii_enc_15101998_fides-et-ratio_en.html (accessed on Oct. 22, 2010).

⁶ National Academy of Sciences (NAS), *Science and Creationism: A View from the National Academy of Sciences*, Second Edition, 1999, http://www.nap.edu/openbook.php?record_id=6024&page=R1 (accessed Sept. 10, 2010); National Academy of Sciences and Institute of Medicine of the National Academies, *Science, Evolution, and Creationism*, 2008, <http://www.nap.edu/catalog/11876.html> (accessed June 19, 2011).

⁷ NAS, *Science, Evolution, and Creationism*, p. 12.

⁸ Mano Singham, “The New War Between Science and Religion,” *Chronicle of Higher Education*, vol. 56, no. 35 (May 14, 2010), pp. B4-B5.

⁹ As cited in Singham, “The New War Between Science and Religion.”

to do it? Before addressing these questions directly, a closer look at the most general precepts for cooperation is in order.

Although all cooperationists share the same goal—to achieve harmonious relations between science and religion for a greater good of humanity—there are some differences in where they place their accents depending where they see their primary loyalties are—in science or in religion. It is beyond the scope of this essay to examine all the nuances of the different views expressed by those who advocate cooperation. A look at the two principal contributors—the Catholic Church and NAS—will be quite sufficient for the purposes of this paper.

The writings of Pope John Paul II and Pope Benedict XVI are certainly the most authoritative sources on the position of the Catholic Church. According to this position, although scientific reason and religion reflect different aspects of reality, they both come from the same source and are intimately related to each other. In a passage of his encyclical letter “Fides et Ratio,” that is informed as much by theology as by poetic imagination, John Paul II refers to faith and reason as “two wings on which the human spirit rises to the contemplation of God.”¹⁰ He also cites the First Vatican Council in support of his views:

Even if faith is superior to reason there can never be a true divergence between faith and reason, since the same God who reveals the mysteries and bestows the gift of faith has also placed in the human spirit the light of reason. This God could not deny himself, nor could the truth ever contradict the truth.¹¹

For Benedict XVI, faith and reason are also part of the same totality. In his view, as John Allen points out, “Whatever the findings of the natural sciences, they will not contradict Christian faith, since ultimately the truth is one.”¹²

For John Paul II and Benedict XVI faith and reason merely reflect different aspects of reality and in many ways complement each other. However, they emphasize that faith plays a unique and very special role. Faith opens for reason a possibility of new knowledge and even a possibility to know what reason on its own will never be able to understand fully. A discussion of the mystery of Divine Revelation in John Paul II’s encyclical letter stresses:

Revelation has set within history a point of reference which cannot be ignored if the mystery of human life is to be known. Yet this knowledge refers back constantly to the mystery of God which the human mind cannot exhaust but can only receive and embrace in faith. Between these two poles, reason has its

¹⁰ John Paul II, “Fides et Ratio,” p. 1.

¹¹ John Paul II, “Fides et Ratio,” paragraph 53.

¹² See John L. Allen Jr., “Benedict’s evolving thought on evolution,” *National Catholic Reporter*, vol. 42, no. 39 (2006), p. 5.

own specific field in which it can enquire and understand, restricted only by its finiteness before the infinite mystery of God.¹³

“Faith alone,” he asserts elsewhere, “makes it possible to penetrate the mystery in a way that allows us to understand it coherently . . . the world and the events of history cannot be understood in depth without professing faith in the God who is at work in them.”¹⁴

On many occasions Pope Benedict XVI has expressed his concern over what he sees as a trend in the contemporary culture to disregard the insights of religious thought and rely excessively on scientific reason. This trend, in his opinion, severely limits human capacity to know and is responsible for many problems that plague the contemporary civilization. In his address delivered at the University of Regensburg in 2006, Benedict XVI offers the following reflection:

Modern scientific reason quite simply has to accept the rational structure of matter and the correspondence between our spirit and the prevailing rational structures of nature as a given, on which its methodology has to be based. Yet the question why this has to be so is a real question, and one which has to be remanded by the natural sciences to other modes and planes of thought—to philosophy and theology. For philosophy and, albeit in a different way, for theology, listening to the great experiences and insights of the religious traditions of humanity, and those of the Christian faith in particular, is a source of knowledge, and to ignore it would be an unacceptable restriction of our listening and responding. Here I am reminded of something Socrates said to Phaedo. In their earlier conversations, many false philosophical opinions had been raised, and so Socrates says: “It would be easily understandable if someone became so annoyed at all these false notions that for the rest of his life he despised and mocked all talk about being—but in this way he would be deprived of the truth of existence and would suffer a great loss.”¹⁵

These statements show that while recognizing the fact that religious and scientific thought complement each other, the Catholic position is that faith plays a unique and special role since it allows an infinite expansion of human knowledge. The distinct feature of the Judeo-Christian tradition is its transcendent deity that has the power of divine creation. This tradition opens the path to knowing the unknown and grasping the mystery of creation. Scientific reason lacks these insights and has so far been refusing to deal with such issues as miracle and creation. As John Paul II put it:

¹³ John Paul II, “Fides et Ratio,” paragraph 14.

¹⁴ John Paul II, “Fides et Ratio,” paragraphs 13 and 16.

¹⁵ Pope Benedict XVI, “Faith, Reason and the University,” p. 709.

We may say, then, that Israel, with her reflection, was able to open to reason the path that leads to the mystery. With the Revelation of God Israel could plumb the depths of all that she sought in vain to reach by way of reason.¹⁶

The position of the scientists' cohort in the camp of cooperationists is in many ways very similar to the position of the cooperationists with primary loyalty to religion. This position owes a great deal to the late Stephen Jay Gould who has articulated and popularized its main precepts. Central to Gould's view is what he sees as the fundamental difference in the way religion and science produce knowledge. While science relies on tangible facts--experimental evidence and observations, religion deals with things that are intangible--values, beliefs, and meanings--and even supernatural. Science and religion cover different domains, or what Gould termed "magisteria" (from "magister," or teacher). Their respective magisteria do not overlap (hence NOMA, or nonoverlapping magisteria) and, therefore, science and religion have no reason to be in conflict. In his article "Nonoverlapping Magisteria" Gould writes:

Consideration of the method used in the various branches of knowledge makes it possible to reconcile two points of view which would seem irreconcilable . . . No such conflict should exist because each subject has a legitimate magisterium, or domain of teaching authority--and these magisteria do not overlap (the principle that I would like to designate as NOMA, or "nonoverlapping magisteria"). The net of science covers the empirical universe: what is it made of (fact) and why does it work this way (theory) The net of religion extends over questions of moral meaning and value. These two magisteria do not overlap, nor do they encompass all inquiry (consider, for, starters, the magisterium of art and the meaning of beauty).¹⁷

Gould suggests that a comprehensive understanding of reality should involve proficiency in both domains:

The lack of conflict between science and religion arises from a lack of overlap between their respective domains of professional expertise--science in the empirical constitution of the universe, and religion in the search for proper ethical values and the spiritual meaning of our lives. The attainment of wisdom

¹⁶ John Paul II, "Fides et Ratio," paragraph 18.

¹⁷ Stephen Jay Gould, "Nonoverlapping Magisteria," *Natural History*, March 1997, pp. 19-20, 60. Gould reiterates this statement almost verbatim in his later book *Rocks of Ages*: "The net, or magisterium, of science covers the empirical realm: what is the universe made of (fact) and why does it work this way (theory). The magisterium of religion extends over questions of ultimate meaning and moral value. These two magisteria do not overlap, nor do they encompass all inquiry [. . .] To cite the old cliché's (sic!), science gets the age of rocks, and religion the rock of ages; science studies how the heavens go, religion how to go to heaven (Gould, *Rocks of Ages*, New York, Ballantine, 1999, p. 6).

in a full life requires extensive attention to both domains--for a great book tells us that the truth can make us free and that we will live in optimal harmony with our fellows when we learn to do justly, love mercy, and walk humbly.¹⁸

In a passage charged with emotion and hope, Gould opines: "I believe, with all my heart, in a respectful, even loving concordat between our magisteria--the NOMA solution."¹⁹

Since Gould's formulation, NOMA has come to express "the consensus of a great majority of professional scientists' and is quite popular among certain philosophers of science as well."²⁰ A statement from NAS reasserts Gould's concept of nonoverlapping magisteria:

Science and religion are based on different aspects of human experience. In science, explanations must be based on evidence drawn from examining the natural world. Scientifically based observations or experiments that conflict with an explanation eventually must lead to modification or even abandonment of that explanation. Religious faith, in contrast, does not depend only on empirical evidence, is not necessarily modified in the face of conflicting evidence, and typically involves supernatural forces or entities. Because they are not a part of nature, supernatural entities cannot be investigated by science. In this sense, science and religion are separate and address aspects of human understanding in different ways. Attempts to pit science and religion against each other create controversy where none needs to exist.²¹

And just like Gould, NAS affirms that "Science is not the only way of knowing and understanding" but merely a way of knowing based on "empirical evidence and testable explanations."²² It even suggests the equality of science and religion as "different ways of understanding" and chastises the opponents of this concordat for reducing "the potential of both to contribute to a better future."²³ This statement issued in 2008 goes quite a bit further than the earlier one in 1999 that merely claimed that science and religion "occupy two separate realms of human experience" and warned that a demand "that they be combined detracts from the glory of each."²⁴

Many prominent individual scientists have spoken and continue to speak in support of NOMA. This support is particularly strong among those scientists who

¹⁸ Gould, "Nonoverlapping magisterial," p. 18.

¹⁹ Gould, "Nonoverlapping magisterial," p. 61.

²⁰ Joshua M. Moritz, "Rendering unto Science and God: Is NOMA Enough?," *Theology & Science*, vol. 7, no. 4 (November 2009), p. 365.

²¹ NAS, *Science, Evolution, and Creationism*, p. 12.

²² NAS, *Science, Evolution, and Creationism*, p. 12.

²³ NAS, *Science, Evolution, and Creationism*, p. 47.

²⁴ NAS, *Science and Creationism*, p. ix.

profess their commitment to Christian faith. They include such recognized authorities in the field of sciences as biologist Francisco Ayala, recipient of 2001 National Medal Of Science and 2010 Templeton Prize, physicist John Polkinghorne, a recipient of the Templeton Prize Francis Collins, director of the Human Genome Project and the National Human Genome Research Institute at the National Institute of Health, Father George Coyne, Catholic priest and a former director of the Vatican Observatory, and many others.

Cooperationists and NOMA have certainly not gone unchallenged and generated a sizable opposition. The opponents of cooperation also constitute a very diverse group. It includes many prominent scientists, such as Steven Weinberg and Richard Dawkins, as well as prominent religious leaders and groups, chief among them are New Earth, Intelligent Design, and Creationists. Representatives of this group argue that perspectives on reality provided by science and religion do not have equal validity; rather one is superior to the other. As has been cited above, critics attack cooperationists, accusing them of a sell out (**see pp. . . . above**).

Signs of internal strain among the cooperationists pose an even greater threat to their agenda than the external criticism. As has already been indicated, the recognition of equal validity of science and religion is central to this group. Yet despite formal protestations of equality, both sides make statements that implicitly claim superiority for their respective domain. Suggestions that “faith is superior to reason” strikes a discordant note in the generally accommodationist tenor of John Paul II’s “Fides et Ratio.”²⁵ “Knowledge which is peculiar to faith,” John Paul II writes, surpasses “the knowledge proper to human reason.”²⁶ “Faith alone,” he opines, “makes it possible to penetrate the mystery in a way that allows us to understand it coherently.”²⁷

Statements suggesting superiority of religious thought abound in public pronouncements by Pope Benedict XVI who frequently argues that “Christianity relies on truths [that are] deeper than empirical observation, chief among them that life has purpose.”²⁸ While welcoming scientific achievements as beneficial for religion, Benedict states that “Whatever the findings of the natural sciences, they will not contradict Christian faith, since ultimately the truth is one.”²⁹ In his address at the University of Regensburg Benedict XVI offered the following reflection:

²⁵ John Paul II, “Fides et Ratio,” paragraph 53.

²⁶ John Paul II, “Fides et Ratio,” paragraph 8.

²⁷ John Paul II, “Fides et Ratio,” paragraph 13.

²⁸ Allen, “Benedict’s evolving thought on evolution.”

²⁹ Allen, “Benedict’s evolving thought on evolution.”

At the same time, as I have attempted to show, modern scientific reason with its intrinsically Platonic element bears within itself a question which points beyond itself and beyond the possibilities of its methodology. Modern scientific reason quite simply has to accept the rational structure of matter and the correspondence between our spirit and the prevailing rational structures of nature as a given, on which its methodology has to be based. Yet the question why this has to be so is a real question, and one which has to be remanded by the natural sciences to other modes and planes of thought—to philosophy and theology. For philosophy and, albeit in a different way, for theology, listening to the great experiences and insights of the religious traditions of humanity, and those of the Christian faith in particular, is a source of knowledge, and to ignore it would be an unacceptable restriction of our listening and responding.³⁰

The mainstream scientific establishment supporting cooperation also does not fail to emphasize in its public statements that science “is not the only way of knowing and understanding” (p. 12) and that science and religion are equal but “different ways of understanding the world” (p. xiii). However, the same statements also express the belief that as science and technology advance, the knowledge they provide will supersede religious belief. In a carefully crafted pamphlet designed not to offend their religious counterparts, the accommodationists from NAS suggest that science is better equipped to make judgments about the real world than religion is.³¹ Such condescension towards religion has not escaped the attention of supporters of cooperation on the side of religion. John Polkinghorne, a physicist and an Anglican priest, makes the following sarcastic observation:

This picture of two disjoint languages has been popular with those scientists who do not want to be disrespectful to religion, understood as a human cultural activity, but who do not want to take seriously its cognitive claims to knowledge of God. If this stance is adopted, a comparison between science and theology is then frequently made in terms that are, in fact, unfavourable to religion. Often, science is held to deal with facts, while religion is supposed to be based solely on opinion. This is a double mistake.³²

The signs of strain in the cooperationist camp indicate that the NOMA approach has failed to resolve tensions that hinder the development of a more collaborative and interactive engagement between science and religion. There is a growing recognition

³⁰ Benedict XVI, “Faith, Reason, and the University,” p. 709.

³¹ See, for example, NAS, *Science, Evolution, and Creationism*, pp. 49-50

³² John Polkinghorne, “The Science and Religion Debate—an Introduction,” Faraday Papers | The Faraday Institute for Science and Religion”, n.d., <http://www.st-edmunds.cam.ac.uk/faraday/Papers.php> (accessed December 8, 2010).

that in order to develop a more productive relationship, NOMA must be abandoned. John Polkinghorne, who seeks to integrate science and religion in one comprehensive worldview, articulates a widely-held attitude when he writes: “. . . virtually all of us engaged in the [science and religion] dialogue reject the offer of a false truce, proffered by Stephen J. Gould (1999) through his concept of ‘nonoverlapping magisteria’ (NOMA).”³³ In his critique of NOMA and NAS, Ernan McMullin urges to search for another and truly collaborative mode for the relationship between science and religion as two autonomous domains:

The human quest for understanding requires us to draw on a diversity of different sources. Science is not merely a means to technical control or accurate prediction; religion is not just a matter of moral action or private converse between the individual and God. Each contributes to our understanding of the complex world in which we are set. The quest for understanding is thus necessarily a collaborative one in which the autonomy of the constituents must be respected.³⁴

The confusion in the camp of the proponents of cooperation raises serious doubts as to whether science and religion will ever be able to come together. Professor Jerry Coyne of the University of Chicago is one of many who express these doubts: “True, there are religious scientists and Darwinian churchgoers. But this does not mean that faith and science are compatible, except in the trivial sense that both attitudes can be simultaneously embraced by a single human mind.”³⁵

The main reason for the failing of the cooperationist project seems to lie in the very idea of non-overlapping magisteria. The separation of the domain of facts from the symbolic universe, that appeared easy to draw in theory, in practice has proven to be much more difficult, if not impossible to realize. Gould himself was aware of the problem. His “Nonoverlapping Magisteria” registers his concern:

The resolution [NOMA] might remain all neat and clean if the nonoverlapping magisteria (NOMA) of science and religion were separated by an extensive no man’s land. But, in fact, the two magisteria bump right up against each other, inter-digitating in wondrously complex ways along their joint border.³⁶

One can understand Gould’s uneasiness. How could a biologist who accepts an evolutionary view of nature argue that aesthetic and moral values have nothing to do with the evolutionary process? Where then have they come from? Could one accept

³³ Moritz, “Rendering unto Science,” p. 372.

³⁴ Michael Buckley, “Religion and Science: Paul Davies and John Paul II,” *Theological Studies*, vol. 51, no. 2 (June 1990), p. 320.

³⁵ Singham, “The New War,” p. B4-B5.

³⁶ Gould, “Nonoverlapping magisteria,” p. 20.

the notion that meanings and values come from outside of nature and still remain an evolutionist? As Joshua Moritz has pointed out, the ubiquity of evolutionary continuity raises a pertinent question: “where exactly does one draw the line between the moral and the natural.”³⁷

Indeed, Gould’s anticipation of problems has proven to be prophetic. Even though the two sides in the cooperationist camp use different methodologies to make their truth claims, they are reluctant to accept the widely divergent views of reality that they project. As has been pointed out earlier, both Pope John Paul II and Pope Benedict XVI have stressed the unitary nature of reality and truth in their public statements.³⁸ The facile pluralism of NOMA has frustrated many supporters of cooperation. A comment by Ian Barbour, one of the most prominent authors on the relationship between science and religion, reflects this frustration: “We cannot remain content with a plurality of unrelated languages if they are language about the same world.”³⁹ “If all true knowledge is ultimately a part of the same reality,” the prominent biologist Denis R. Alexander asks rhetorically, “then how can these domains be separate in the first place?”⁴⁰

Since the boundary between the two magisteria has proven to be problematic, mutual encroachments are quite common. No contemporary religious discourse can be oblivious to the findings of modern science. Likewise religious influences also enter the domain of science.⁴¹ The emergence of such fields of study as sociobiology, evolutionary psychology, genetic epistemology, among others, are good examples of science intruding on the domain of values and meanings. As philosopher and theologian Alan Padgett explains, the movement across the imaginary boundary between science and religion “has been in both directions, with theology providing foundational assumptions for certain key scientists, and scientific discoveries challenging theology to revisit and revise its conclusions on several matters relating to a Christian understanding of the world.”⁴²

As the premise of non-overlapping magisteria has proved to be untenable both in theory and in practice, many supporters of cooperation shifted their focus away from NOMA in search of a new model. Proposals that are currently in circulation range

³⁷ Moritz, “Rendering unto Science,” p. 367.

³⁸ See pp. 5-8 above.

³⁹ Moritz, “Rendering unto Science and God,” p. 372.

⁴⁰ Denis R. Alexander, “Models for Relating Science and Religion,” Faraday Papers | The Faraday Institute for Science and Religion”, n.d., <http://www.st-edmunds.cam.ac.uk/faraday/Papers.php> (accessed on December 8, 2010), p. 3.

⁴¹ Moritz, “Rendering unto Science,” pp. 370-72; Christopher J. Corbally, “Science and faith: An astronomer’s perspective.,” *America*, vol. 170, no. 12 (April 9, 1994), pp. 22-25.

⁴² As quoted in Moritz, “Rendering unto Science,” p. 370.

from the need for an interactive dialogue to various degrees of integration of science and religion and the development of a worldview that is fully scientific and theologically faithful where theology and science mutually inform each other.⁴³ Despite their differences, these proposals agree on a need to achieve a fully collaborative and more interactive engagement between science and religion. The question, however, remains: Is it possible to achieve this goal in principle? Why such relationship between science and religion has not emerged so far? Why does the metaphor of warfare and conflict persist? Why do tensions between science and religion endure? There must be some persistent reason that works against their resolution.

Tensions are due to real or perceived threat. Is it possible that religion and science pose a threat to each other? Although at first glance this hypothesis may seem plausible, upon a closer look it must be rejected. Science has its standards and scientists generally adhere to these standards. Even those scientists like Morris, Ayala, and others who profess their religious beliefs must observe these standards. Otherwise they will lose their credibility and respect as scientists. Likewise, science poses little threat to religion. It says little on issues central to religion. Moreover, scientists, as professionals, show little interest in these issues. The growing role of science in modern society has not had much impact on the popular appeal of religious belief. Statistical data show, for example, that for an overwhelming majority of Americans religious belief remains a vital aspect of their life. These facts and considerations make one reject a hypothesis of mutual threat. Therefore, resistance to more cooperative relations must come from elsewhere. One possibility is that it is due to internal tensions experienced by science and religion within their respective domains.

One of the most fundamental goals of science is to render reality intelligible. The belief that the progress of science is unlimited and that no secret of nature can withstand the assault of scientific reason is widespread in the community of scientists. Intelligibility, as Peter Dear stresses, “has guided and shaped the very content of

⁴³ See Alan Padgett, “Dialectical Realism in Theology and Science,” *Perspective on Science and Christian Faith*, vol. 54 (2002), pp. 184-192; Moritz, “Rendering unto Science and God”; Ian G. Barbour, *Religion and Science: Historical and Contemporary Issues* (San Francisco: Harper San Francisco, 1997); Catherine M. Punsalan-Manlimos, “Religion, Science, and Culture: Learning from Langdon B. Gilkey,” *American Journal of Theology & Philosophy*, vol. 31, no. 1 (2010), pp. 15-32; Charles L. Harper, “Why science and religion need to talk,” *Nature*, vol. 411, no. 6835 (May 17, 2001), p. 239; Dorothy Nelkin, “God Talk: Confusion between Science and Religion: Posthumous Essay,” *Science, Technology, & Human Values*, vol. 29, no. 2 (Spring 2004), pp. 139-152; Arthur Peacocke, “‘The End of All Exploring’ in Science and Religion,” *Zygon*, vol. 39, no. 2 (June 2004), pp. 413-29.

scientific knowledge.”⁴⁴ And yet the vision projected by the contemporary scientific reason is that reality at its most fundamental level is chaotic, unpredictable, indeterminate, and ultimately inaccessible to rational understanding. The following two examples illustrate this point: the Standard Model of particle physics and the Neo-Darwinist interpretation of the evolutionary theory.

According to the Standard Model of particle physics, reality at the fundamental level of subatomic particles is random, chaotic, and largely inaccessible to human understanding. Richard Feynman, a Nobel laureate in physics, has issued this famous warning at the peak of the most dynamic period in modern physics:

Do not keep saying to yourself, if you can possibly avoid it, “But how can it be like that?” because you will get 'down the drain,' into a blind alley from which nobody has yet escaped. Nobody knows how it can be like that.⁴⁵

Steven Hawking’s take on Einstein’s famous adage leaves little hope for reason to ever penetrate the fundamental mysteries of the universe: “Not only does God definitely play dice, but He sometimes confuses us by throwing them where they can't be seen.” It is not merely, the Standard Model asserts, that human reason is too weak to penetrate these mysteries but (following the fundamental conclusion drawn by Werner Heisenberg) that they are in principle unintelligible. As John Cramer, the author of the transaction interpretation of quantum mechanics, summarizes, the problem

. . . is not that it [QT] asserts an intrinsic randomness but that it supplies no insight into the nature or origin of this randomness. If “God plays dice,” as Einstein has declined to believe, one would at least like a glimpse of the gaming apparatus that is in use.⁴⁶

Neo-Darwinism, by far the most dominant contemporary theory of evolution, also emphasizes that randomness lies at the core of the evolutionary process. According to this theory, species evolve as a result of random mutations of genes that are then selected for fitness. Moreover, the course of the evolution is ruled by contingency. As Gould has argued, “. . . run the tape [of the evolution] again, and the first step from prokaryotic to eukaryotic cell may take 12 billion years instead of two . . .”⁴⁷

⁴⁴ Peter Dear, *The Intelligibility of Nature: How Science Makes Sense of the World*, Chicago, The University of Chicago Press, 2006, p. 174.

⁴⁵ Online source at <http://www.spaceandmotion.com/Physics-Richard-Feynman-OED.htm#Quotes.Richard.Feynman> (accessed on October 20, 2008).

⁴⁶ John G. Cramer, “The transactional interpretation of quantum mechanics,” *Review of Modern Physics*, vol. 58, July 1986, p. 658.

⁴⁷ See S. J. Gould, *Wonderful Life*, London, Penguin Books, 1989 (as quoted in Pier Luisi, “Contingency and Determinism,” *Philosophical Transactions of the Royal Society of London A*, vol. 361 [2003], p. 1142). Luisi

Thus, contemporary science asserts that reality at its core is beyond the reach of human understanding. No lesser authority in the world of science than Steven Weinberg, one of the most eloquent advocates for science's intellectual pre-eminence, has publicly acknowledged these limitations.⁴⁸ Yet despite the fact that the scientific establishment has endorsed the current view that these limitations are intrinsic to nature, on close examination they appear to be self-imposed. As I have argued elsewhere, neither randomness nor determinism is intrinsic to reality. Rather, viewing reality in terms of either randomness or determinism requires a subjective choice that remains critically unexamined.⁴⁹ The atomistic analytical approach prevalent in contemporary science dictates this choice that is preserved and perpetuated by the scientific establishment. As Daniel Sarewitz shows, extensive powers in allocating funds for scientific research, control over appointments and publications allow the scientific establishment to protect effectively the dominant theoretical perspectives and the limits that they impose. How can an alternative voice be heard when even the contestation of truth claims is more often than not adjudicated on the basis of what Kant called "synthetic a priori judgments"?⁵⁰ As a result, Sarewitz aptly summarizes, ". . . the world that science does illuminate is partial, and the boundaries of this partial world have an arbitrary, capricious, and political component."⁵¹

The notion that significant and important aspects of reality are inaccessible to human understanding runs counter to the self-professed mission of science and defies the ethos that inspires scientists in their quest for knowledge. Thus limits imposed by the scientific establishment create a contradiction between, on one hand, the professed mission and ideology of science and, on the other, the real self-imposed constraints on scientific reason. This contradiction generates tension in the scientific community between the supporters of status quo and those who seek to lift the limits on knowledge imposed by the scientific establishment. It also poses a threat of

echoes the same contingency view in his article: "At the present stage, one should accept the view that these few proteins of life are with us as the products of the bizarre laws of contingency, followed by chemical evolution processes" (ibid., p. 1144). See also Francois Monod, *Chance and Necessity: Essay on the Natural Philosophy of Modern Biology*, New York, Alfred A. Knopf, 1971; and Francois Jacob, *The Possible and the Actual*, Seattle, University of Washington Press, 1982.

⁴⁸ Steven Weinberg, "Can Science Explain Everything? Anything?" *The New York Review of Books* (May 31, 2001).

⁴⁹ Gennady Shkliarevsky, "On Order and Randomness: A View from the Edge of Chaos," [arXiv:1104.4133v1](https://arxiv.org/abs/1104.4133v1) [physics.hist-ph].

⁵⁰ Daniel Sarawetz, "Normal Science and Limits of Knowledge: What We Seek to Know, What We Choose to Know, What We Don't Bother Knowing," *Social Research*, vol. 77 (2010), p. 998.

⁵¹ Sarewitz, "Normal Science," p. 1006.

undermining the credibility of the scientific community's commitment to understanding reality. There is only one way of resolving this contradiction: the scientific community should reaffirm its commitment to its professed mission and remove the self-imposed limits on scientific reason. Such solution would require a critical re-examination of the fundamental assumptions, or self-evident truths, upon which modern science constructs its knowledge. However, the scientific establishment refuses to pursue this course and the contradiction and the tensions associated with it remain in place.

One can understand why in the absence of a real solution, the scientific establishment is disinclined to engage religious heritage in an open-minded and constructive intellectual dialogue.⁵² Such dialogue can only succeed if the scientific community will be willing to recognize and subject to critical examination its own items of faith, synthetic a priori judgments, and self-evident truths. It will have to show its willingness to abandon the familiar and comfortable boundaries of its established conception of reality—something that the scientific establishment has so far shown little will to do; hence the resistance to entering into a genuine dialogue.

Although the religious establishment appears to be more open to enter a dialogue and engage contemporary science and its issues, the appearance is deceptive. Many prominent church leaders embrace science only to bolster the traditional religious dogmas rather than open them to rational examination. While they may publicly affirm their commitment to reason, they also jealously protect their doctrines by imposing dogmatic constraints. Even the Catholic Church that eagerly cultivates the image of being pro-science persists in its conviction that the principal fundamentals of its doctrine—such as faith, creation, revelation, incarnation, and miracles—are ultimately inaccessible to rational understanding. The Church, for example, continues to adhere to the First Vatican Council's emphatic reaffirmation that

. . . there exists a knowledge which is peculiar to faith, surpassing the knowledge proper to human reason, which nevertheless by its nature can discover the Creator. This knowledge expresses a truth based upon the very fact of God who reveals himself, a truth which is most certain, since God neither deceives nor wishes to deceive.⁵³

⁵² I use the term "scientific establishment" quite deliberately here since the top elite of modern science is disproportionately resistant to a dialogue with religion. Surveys show that while 60 percent of the general scientific population are either agnostic or non-believers, the number of non-believers among "top scientists" is 93 percent (Arthur Peacocke, "'The End of all our Exploring' in Science and Theology," *Zygon: Journal of Religion & Science*, vol. 39, no. 2 (June 2004), p. 418).

⁵³ John Paul II, "Fides et Ratio," par. 8.

In other words, human reason cannot on its own understand creation but can only grasp its truth through faith.

Explaining the position of the Church on the relationship between reason and faith, Michael Smith stresses the pre-eminence of faith and its superiority vis-à-vis reason. While the latter can discover the existence of God, it is faith—an irrational act—that is capable of revealing God’s truth. Reason, he explains, merely provides

. . . the means by which the person of faith can further probe the truths proper to faith once these are known. Thus, even though the source and much of the content of Revelation are not within the grasp of reason unaided by grace, nonetheless reason and freedom are at work before, during, and after the act of faith.⁵⁴

“When one speaks of faith,” he reiterates, “what is meant here is that faith is a kind of knowledge that, although not in contradiction to reason, is not reducible to the knowledge gained by reason.”⁵⁵ In another passage Smith rhapsodizes:

When we bump up against the limits of reason, and reason surely has limits, we stand at the edge not of illusion but of the infinite. This is not to suggest that we ought to try to cross those limits, for we cannot. Rather, faith enables us to recognize the power of human reason to discover truth but also the limitations of reason before a truth that surpasses reason’s abilities. In the life of a person of faith, faith and reason are not separate, however distinct their sources and much of their content.⁵⁶

Emphatic affirmations that the domain of faith is ultimately inaccessible to understanding, endorsed by the Catholic Church and other religious denominations, in effect set limits to how far reason can venture in understanding reality. Many believers, however, refuse to accept these limits and try to pursue new paths in their quest for rationalizing religion. The rejection of the official doctrine in the community of believers has given rise to such phenomena as Young Earth and Intelligent Design. It is beyond the scope of this paper to evaluate these two intellectual trends. One fact, however, is indisputable: regardless of the validity of their arguments, contemporary science has had a profound effect on both Young Earth and Intelligent Design that try to reinterpret prevalent religious doctrines in light of scientific knowledge. For this reason, the Church strongly opposes both

⁵⁴ Michael A. Smith, “Beyond Fideism and Antirationalism: Some Reflections on Fides et ratio,” *Logos*, vol. 4, no. 4 (Fall 2001), pp. 114-15.

⁵⁵ Smith, “Beyond Fideism,” p. 114.

⁵⁶ Smith, “Beyond Fideism,” p. 115.

trends and has repeatedly criticized them.⁵⁷ The Church has also emphatically endorsed the Darwinian theory as perfectly “compatible with Christian faith.”⁵⁸

Michael J. Buckley offers a typical defense of the Church’s position against efforts to rationalize faith in his article “Religion and Science: Paul Davies and John Paul II.” He focuses his critique on Paul Davies, a physicist and the recipient of the 1995 Templeton Prize, who states in his book *God and New Physics* (1983) that science, in his view, “offers a surer path to God than religion.”⁵⁹ He counters Davies’s view by invoking the letter by John Paul II to the Reverend George V. Coyne, a Jesuit priest and a former Director of the Vatican observatory, in which the Pope reasserts the Church’s traditional reliance on faith. Summarizing the views of the Pope on the relationship between science and religion, Buckley argues that the proper way to see these relations is in terms of division of labor:

If the scientific enterprise, like any other human endeavor, raises questions beyond its own capacities to resolve, perhaps one way of integration of science into broader human culture may occur when the questions it generates are taken up by another form of disciplined reflection.⁶⁰

Although Pope Benedict XVI, just like his predecessor Pope John Paul II, has endorsed the current biological theory of the evolution as “good science,” his carefully worded statements still emphasize the primacy of what he calls “creative divine reason” over human understanding. In his Easter vigil homily of 2011, the Pope explained:

The world is a product of the Word, of the Logos, as Saint John expresses it, using a key term from the Greek language. "Logos" means "reason", "sense", "word". It is not reason pure and simple, but creative Reason, that speaks and communicates itself. It is Reason that both is and creates sense.⁶¹

⁵⁷ See, for example, the article “Pope Benedict XVI’s astronomer: the Catholic Church welcomes aliens,” *The Telegraph* (September 17, 2010) that quotes Brother Guy Consolmagno, a senior Vatican scientist and the curator of the Pope’s meteorite collection, as saying that the idea of intelligent design has been hijacked by religious extremists. The article “Rome Weighs in (Gently) on Intelligent Design” by Jeff Israely (*Time*, January 19, 2006) covers a critical article on Intelligent Design that appeared in the newspaper *L’Osservatore Romano* that the Roman Curia often uses to air its views.

⁵⁸ Richard Owen, “Vatican buries the hatchet with Charles Darwin,” *The Times* (February 11, 2009). According to the article, the conference held at that time in the Pontifical Gregorian University discussed Intelligent Design but “merely as a ‘cultural phenomenon’, rather than a scientific or theological issue.”

⁵⁹ Paul Davies, *God and the New Physics* (New York: Simon & Schuster, 1983), p. ix, as quoted in Michael J. Buckley, “Religion and science: Paul Davies and John Paul II,” *Theological Studies*, vol. 51, no. 2 (June 1990), p. 311.

⁶⁰ Buckley, “Religion and Science,” p. 323.

⁶¹ See “Pope’s Easter Vigil Homily: We Celebrate the First Day of the New Creation (April 25, 2011) at <http://www.catholic.org/clife/lent/story.php?id=41157&page=2> (accessed July 11, 2011).

He goes on to emphasize the role of this creative divine reason in the evolution and the rise of man:

If man were merely a random product of evolution in some place on the margins of the universe, then his life would make no sense or might even be a chance of nature. But no, Reason is there at the beginning: creative, divine Reason. And because it is Reason, it also created freedom; and because freedom can be abused, there also exist forces harmful to creation.⁶²

The emphasis on the word “creative” is very significant in the above statement. It suggests that creation is accessible only to divine reason. Man can grasp this divine reason through faith, not science. Incidentally, this view is similar to the prevalent attitudes in the scientific community. Topics dealing with creation and emergence are not particularly high on the list of funded research projects.

Despite the continued insistence by the Catholic Church, as well as other religious denominations, on the unique role of faith in understanding the truth of divine revelation and incarnation, there is a persistent pressure in the community of believers to remove the constraints on reason and to re-think the central religious tenets in light of human reason and science. Young Earth and Intelligent Design are probably the most radical expressions of this trend but they are certainly not alone. The pressure also comes from more moderate segments of the religious community. Arthur Peacocke, for example, urges “a more open theology that takes account of scientific perspectives.”⁶³ One can sense it in the words of the Reverend John Polkinghorne who writes in his introduction to a debate on science and religion:

The doctrine of creation is not primarily concerned with how things began, but why they exist. God is seen to be the ordainer and sustainer of the cosmos, as much its Creator today as at the epoch of the big bang. The latter event is interesting scientifically, but not really critical theologically. This understanding leads to the picture of creation as a continuously unfolding process in which God acts as much through the results of natural process as in any other way. A fruitful dialogue between science and religion has to be based on this understanding of creation.⁶⁴

The idea of rethinking the conception of God as a condition for a fruitful exchange between science and religion is also the subject of an article by Gordon Kaufman that appeared in *Zygon: Journal of Religion and Science*. The development of

⁶² See “Pope’s Easter Vigil Homily: We Celebrate the First Day of the New Creation (April 25, 2011) at <http://www.catholic.org/clife/lent/story.php?id=41157&page=2> (accessed July 11, 2011).

⁶³ See, for example, Arthur Peacocke, “‘The End of All Our Exploring’ in Science and Theology,” p. 413.

⁶⁴ John Polkinghorne, “The Science and Religion Debate—an Introduction.”

new approaches to religion that fully integrate achievements of modern scientific and secular thought, Kaufman argues, requires the elimination of anthropocentrism and anthropomorphism from the conception of God:

It is no longer possible, I contend, to connect in an intelligible way the traditional conception of God—constructed, as it is, in thoroughly anthropomorphic terms—with today’s scientific cosmological and evolutionary understandings of the origin of the universe and the emergence of life, including human life.⁶⁵

His proposed solution involves rethinking God in terms of the modern theory of emergence. The creation of new forms is in the center of this theory. “Thinking of God today as creativity (instead of as The Creator),” Kaufman argues, “enables us to bring theological values and meanings into significant connection with modern cosmological and evolutionary thinking.”⁶⁶ It is interesting that Stuart Kauffman, a theoretical biologist and a self-described atheist, expresses a similar view. He proposes to reinvent the idea of the sacred in light of the achievements of modern science and rethink the conception of God in terms of the creative processes he sees in nature: “Thus, beyond the new science that glimmers a new worldview, we have a new view of God, not as transcendent, not as an agent, but as the very creativity in the universe itself.”⁶⁷ One of the principal voices on the subject of complex systems and emergence, Kauffman sees such rethinking as essential for meeting the challenges that stand before human civilization:

I believe we need a shared view of God, a fully natural God, to orient our lives. We need a shared view of the sacred that is open to slow evolution, because rigidity in our view of the sacred violates how our most precious values evolve and invites ethical hegemony. We need a shared global ethic beyond our materialism. I believe a sense of God as the natural, awesome creativity in the universe can help us construct the sacred and a global ethic to help shape the global civilization toward what we choose with the best of our limited wisdom.⁶⁸

It is interesting that both articles express the belief that creativity is essentially inaccessible to human reason—a view that is not that different from the one, for example, by the Catholic Church. Gordon Kaufman thinks of creativity as

⁶⁵ Gordon D. Kaufman, “A Religious Interpretation of Emergence: Creativity as God.,” *Zygon: Journal of Religion & Science*, vol. 42, no. 4 (December 2007), p. 917.

⁶⁶ Kaufman, “A Religious Interpretation of Emergence,” p. 915.

⁶⁷ Stuart Kauffman, “Beyond Reductionism: Reinventing the Sacred.,” *Zygon: Journal of Religion & Science*, vol. 42, no. 4 (December 2007), p. 905

⁶⁸ Kauffman, “Beyond Reductionism,” p.903.

serendipitous and hence ultimately subject to chance.⁶⁹ Stuart Kauffman recognizes that “emergence often is entirely unpredictable beforehand, from the evolution of novel functionalities in organisms to the evolution of the economy and human history.”⁷⁰ Hence, unsurprisingly, he sees that

. . . the evolution of the biosphere is nonalgorithmic. It cannot be simulated, certainly with continuous spacetime and quantum mechanics playing a role.⁷¹

As one can see, both articles represent a significant departure from the traditional conceptualization of God by the Catholic Church and other religious denominations. Their conceptualization bears unmistakable marks of the influence of contemporary science: it fully incorporates modern scientific concepts and language. Even if in some important respects the articles agree with the more traditional views of the Catholic Church and other religious denominations (for example, they both view creation as inaccessible to human reason), the subversive influence of such articles is unmistakable. They clearly recognize the capacity of scientific rationality to be used in reinterpreting and re-conceptualizing religious heritage.

The discourse exemplified in these and similar articles clearly challenges constraints on reason established, for example, by the Catholic Church. Engaging in a constructive and open-minded dialogue with science would most certainly mean a recognition of the capacity of human reason and scientific rationality to probe the most fundamental religious tenets—those that the Church consider accessible only through faith. One can understand why the Church that readily endorses numerous scientific theories is less than willing to enter into a genuine open-minded and constructive dialogue with science.

One should not create a false impression that the reluctance to enter into a constructive dialogue is all about power. Although, following Michel Foucault, one would be naïve to exclude considerations of power that are certainly relevant to the imposition of limits on reason, there are more fundamental reasons for the reluctance to enter into a dialogue. Production of knowledge involves conservation. Both religion and science provide important insights into the nature of reality and our place in this world. For science, for example, it is the recognition of the infinite power of human reason. For religion, it is the awareness that knowledge production involves the irrational and that knowledge is integrally related to morality and aesthetic

⁶⁹ Kaufman, “A Religious Interpretation of Emergence,” p. 916 also Gordon D. Kaufman, “On Thinking of God as Serendipitous Creativity,” *Journal of the American Academy of Religion*, vol. 69, no. 2 (June 2001), p. 409.

⁷⁰ Kauffman, “Beyond Reductionism,” p. 903.

⁷¹ Kauffman, “Beyond Reductionism,” p. 913.

values—a conviction that is expressed in the notion of syncretism of truth, beauty, and justice. These are important realization that neither side, with fully justifiable reason, wants to give up. Crossing over toward each other's positive realizations requires daring, intellectual audacity, and the capacity for risk-taking that neither side seems to possess at this point. Abstaining from dialogue and protecting one's territory seems like a safer choice. But it extorts a heavy price: imposing limits on how much we humans can know.

The result of this defensive strategy is that major resources are committed to conservation or incremental accretion of old knowledge, rather than to the creation of new knowledge that our civilization, as the current crises show, increasingly needs. Will the two sides have the wisdom and courage to overcome their inertia? Will they enter into a genuinely productive dialogue with each other? Only future will tell. One thing is certain, however: our civilization has survived so far to a great extent because there have been those with courage to embark on new paths. It is extremely unlikely that our time will be any different. The choice of not pursuing new knowledge is only a very distant and largely theoretical possibility. The real choice is the cost: whether we will be able to move forward efficiently and with relatively few losses or whether again, as in the past, with the high cost of both in material wealth and human life.

Gennady Shkliarevsky
Bard College
Annandale-on-Hudson,
NY 12504
tel. 845-876-3091
shkliare@bard.edu

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