TRADITION AND TODAY: RELIGION AND SCIENCE

Introduction

Although the title might imply that I consider religion as traditional and science as modern, my intention in this brief essay is rather opposite to that. I wish to present four case histories which indicate that the relationship between religion and science has, in the course of three centuries, passed from one of conflict to one of compatible openness and dialogue. In doing this I hope to show that the natural sciences have played a significant role in helping to establish the kind of dialogue that is absolutely necessary for the enrichment of the multifaceted aspects of human culture, whether traditional or modern. I will speak of the following four periods of history: (l) the rise of modern atheism in the 17th and 18th centuries; (2) anticlericalism in Europe in the 19th century; (3) the awakening within the Church to modern science in the first six decades of the 20th century; (4) the Church's view today. The approach of science to religion in each of these periods can be characterized respectively as: (l) temptress; (2) antagonist; (3) enlightened teacher; (4) partner in dialogue.

The Temptation

In his detailed study of the origins of modern atheism[i] Michael Buckley, S.J. concludes that it was paradoxically precisely the attempt in the 17th and 18th centuries to establish a rational basis for religious belief through arguments derived from philosophy and the natural sciences that led to the corruption of religious belief. Religion yielded to the temptation to root its own existence in the rational certitudes characteristic of the natural sciences. According to Buckley such philosophers as Leonard Lessius and Marin Mersenne decided that the existence of God must be so well established from philosophical arguments that evidence derived from religious experience itself became secondary or even forgotten. This rationalist tendency found its apex in the enlistment of the new science, characterized by such figures as Isaac Newton and Rene Descartes, to provide the foundation for religion. Modern science has its origins in the development of the experimental method in the 17th and 18th centuries. In the 17th century, with

Galileo as a principle protagonist, the experimental method was perfected and the application of mathematics to scientific research was begun. With Isaac Newton we come to the real beginning of modern science. Although the Galileo case, as it is called, provides the classical example of confrontation between science and religion, it is really in the misappropriation of modern science by such as Isaac Newton to mistakenly establish the foundations for religious belief that we find the roots of a much more deep seated confrontation. From these roots, in fact, sprang the divorce between science and religion in the form of modern atheism.

Thus science served as a temptress to religion. The certainties born of the scientific method gave birth to the desire for identical certainties as a foundation for religious belief. That desire was radically misplaced and led to a lengthy period of misunderstanding between religion and science.

Antagonism

As to the second movement in the dissonant symphony initiated by religion and science we turn to nineteenth century anticlericalism. Some episodes which reveal aspects of this anticlericalism and its influence on the development of the relationship between science and religion are described by Sabino Maffeo, S.J. in his history of the Vatican Observatory on the occasion of its 100th anniversary[ii] In fact, the founding of the Observatory in 1891 by Pope Leo XIII is set very clearly in that climate of anticlericalism and one of the principle motives that Leo XIII cites for the foundation is to combat such anticlericalism. His words show very clearly the prevailing mistrust of many scientists for the Church:

> So that they might display their disdain and hatred for the mystical Spouse of Christ, who is the true light, those borne of darkness are accustomed to calumniate her to unlearned people and they call her the friend of obscurantism, one who nurtures ignorance, an enemy of science and progress . . .[iii]

And so the Pope presents, in opposition to these accusations, a very strong, one might say even triumphalistic, view of what the Church does:

> Right from its beginnings all that the Church has done and taught is an

> adequate refutation of these impudent and sinister lies. In fact, the Church, besides her pursuit of divine realities, in which she is the unique teacher, also nourishes and gives guidance in the practice of philosophy . . . and she does this so well that it would be difficult to add anything worth mentioning and it would be dangerous to dissociate oneself from her teachings.[iv]

He then terminates this *Motu Proprio* in which he established the Observatory by stating:

> . . . in taking up this work we have become involved not only in helping to promote a very noble science, which more than any other human discipline, raises the spirit of mortals to the contemplation of heavenly events, but we have in the first place put before ourselves the plan . . . that everyone might see that the Church and its 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 dedication.[v]

Although the historical circumstances did not provide a healthy climate for a dialogue between religion and science, the founding of the Vatican Observatory, even if couched in triumphalistic terms, proved to be a quite positive contribution to the dialogue, both at the time of its foundation and in its subsequent 100 year history.[vi]

Enlightenment

We now pass to the period of enlightenment. For the purposes of this paper and for the sake of brevity, when I speak of the awakening of the Church to science during the first six decades of the 20th century, I am really speaking of the personage of Pope Pius XII. He was a man of rich culture and even in his youth he had become acquainted with astronomy through his association with Father Giuseppe Lais, Oratorian, who was an astronomer at the Vatican Observatory from 1890 to 1921 and the one most responsible for the completion of the International Sky Mapping Program of the Vatican Observatory.[vii] The Pope had an excellent college level knowledge of astronomy and he frequently discussed astronomical

research with Father Daniel O'Connell, S.J., the then Director of the Vatican Observatory.[viii] Pius XII's discourses on astronomical and cosmological themes are summarized by P.J. McLaughlin.[ix] However, the Pope was not immune from the rationalist tendency which I spoke about above and his understanding of the then most recent scientific results concerning the origins of the Universe led him to a somewhat concordant approach to seeing in these scientific results a rational support for the Scriptura1, and derived doctrinal, interpretation of creation. This tendency was first revealed in the address, *Un'Ora*, delivered to the Pontifical Academy of Sciences on 22 November 1951[x] in which he attempted to examine the scientific results from which arguments for the existence of God the Creator might proceed. Even at that time the Papal discourse created a great deal of negative comment.[xi] But this was only the beginning of what was to be a very difficult period. It was only, in fact, through the most delicate but firm interventions of Georges Lemaître, the father of the theory of the primeval atom which foreshadowed the theory of the Big Bang, and Father Daniel O'Connell, S.J., that the Pope was dissuaded from following a course which would have surely ended in disaster for the relationship between the Church and scientists.[xii]

The specific problem arose from the tendency of the Pope to identify the beginning state of the Big Bang cosmologies, a state of very high density, pressure and temperature which was, at that time, thought to have occurred about one to ten billion years ago, with God's act of creation. He had stated, for instance, that:

> . . . contemporary science with one sweep back across the centuries has succeeded in bearing witness to the august instant of the primordial Fiat Lux, when along with matter there burst forth from nothing a sea of light and radiation . . . Thus, with that concreteness which is characteristic of physical proofs, modern science has confirmed the contingency of the Universe and also the well founded deduction to the epoch when the world came forth from the hands of the Creator.[xiii]

Lemaître had considerable difficulty with this view of the Pope. Although he was a respected cosmologist, he was also a Catholic priest and, since solid scientific evidence for his theory was lacking at that time, he was subject to the accusation that his theory was really born of a spirit of concordism with the religious concept of creation. In fact, it was only with the discovery in 1965 of the

cosmic background radiation that persuasive scientific evidence for the Big Bang became available.[xiv] Lemaître insisted that the Primeval Atom and Big Bang hypotheses should be judged solely as physical theories and that theological considerations should be kept completely separate.[xv]

The contrasting views reached a climax when the time came for the preparation of an address which the Pope was to give to the Eighth General Assembly of the International Astronomical Union to be held in Rome in September 1952. On his way to a scientific congress in Cape Town, South Africa, Lemaître stopped in Rome to consult with Father Daniel O'Connell, S.J. and the Cardinal Secretary of State concerning the address. The mission was apparently a success, since in his discourse delivered on 7 September 1952[xvi], although he cited many specific instances of progress made in the astrophysical sciences during the last half century, he made no specific reference to scientific results from cosmology or the Big Bang. Never again did Pius XII attribute any philosophical, metaphysical, or religious implications to the theory of the Big Bang.

A Summary: Temptation, Antagonism, Enlightenment

To summarize, from what has been said of the three selected historical periods, I believe we can conclude the following. First, as an inheritance from the origins of modern atheism in the 17th and 18th centuries, there has been within the Church a tendency to associate scientific research with atheism. Up until the 1970s, for instance, all of the organization of formal dialogue between the Church and the world of was handled by the Vatican Secretariat for Non-believers (currently called the Pontifical Council for Dialogue with Non-believers) . Most recently much of the dialogue has been organized by the Pontifical Council for Culture, founded in 1982. Secondly, a type of "siege" or triumphalist mentality characterized the thinking of the Church at the time of the foundation of the Vatican Observatory. To my estimation, this mentality of "we will show them what the Church can do" has not completely faded from sight. Thirdly, when enlightened to the magnificent progress in scientific research in the first six decades of this century, the Church wished too hastily to appropriate the results of science to its own ends. Recently there has been a view from Rome that contrasts in a significant way with each of these previous historical periods.

Partnership in Dialogue

Although there are many others, the sources for deriving the most recent view from Rome concerning the relationship of science and faith are essentially three messages of His Holiness John Paul II: (l) the discourse given to the Pontifical Academy of Sciences on 10 November 1979 to commemorate the centenary of the birth of Albert Einstein[xvii]; (2) the discourse given 28 October 1986 on the occasion of the fiftieth anniversary of the Pontifical Academy of Sciences[xviii]; the message written on the occasion of the tercentennial of Newton's *Principia Mathematica* and published as an introduction to the proceedings of the meeting sponsored by the Vatican Observatory to commemorate that same tercentennial[xix].

The public view of the first two discourses has emphasized the statements made by the Pope concerning the Copernican-Ptolemaic controversy of the 17th century and especially the role of Galileo in those controversies. These statements have certainly set the stage for a new openness of the Church to the world of science. In his statements concerning Galileo the Pope essentially does two things. He admits that there was wrong on the part of Churchmen and apologizes for it. He calls for a serene, studious, new investigation of the history of that time. In fact, he requests that specific tasks be undertaken:

> . . . I hope that theologians, scholars, and historians, animated by a spirit of sincere collaboration, will study the Galileo case more deeply and, in loyal recognition of wrongs from whatever side they come, will dispel the mistrust that still opposes, in many minds, the fruitful concord between science and faith, between the Church and the world. I give my support to this task which will be able to honor the truth of faith and of science and open the door to future collaboration.[xx]

As a result of this call of the Pope, in 1981 a Pontifical Commission on Galileo was set up to carry out the wishes of the Pope. The workings and conclusions of this commission have been discussed by me elsewhere.[xxi]

There has, in my opinion, been an excessive emphasis upon the Papal statements concerning Galileo. If one reads the three Papal documents which I have referred to above, it will be clear that there are many matters of much more significance and much more forward looking than a reinvestigation of the Galileo

case and I will discuss these below. The Pope's call for something to be done concerning the Galileo controversy occurred in 1979. In 1981 a Pontifical Commission was finally constituted. In the intervening two years public expectation as to what was going to happen became quite imaginative to the point that both a retrial of the poor man and his canonization were reported in the press.[xxii] When the Commission was finally announced, it was made patently clear that neither of these alternatives was intended. But, it was too late. Public expectation had filled the gap. But no great harm was done, provided we really see the newness in the Papal messages referred to above and not just a new look at Galileo.

The old view from Rome with respect to science and religion, characterized by the three historical periods I have traced above, can be considered respectively as: science is atheistic and has been the temptress of religion, the two are antagonistic, the Church has been enlightened but is still rationalistic. The newness in what John Paul II has said about the relationship consists in his having taken a position compellingly opposed to each of those three postures. This statement is justified in all of the documents referred to, but principally in the third, the message on the occasion of the tercentennial of Newton's *Principia Mathematica*.[xxiii] I would like now to briefly analyze that message in light of what I have just claimed.

John Paul II clearly states that science cannot be used in a simplistic way as a rational basis for religious belief, nor can it be judged to be by its nature atheistic, opposed to belief in God.

> . . . Christianity possesses the source of its justification within itself and does not expect science to constitute its primary apologetic. Science must bear witness to its own worth. While each can and should support the other as distinct dimensions of a common human culture, neither ought to assume that it forms a necessary premise for the other. The unprecedented opportunity we have today is for a common interactive relationship in which each discipline retains its integrity and yet is radically open to.the discoveries and insights of the other.[xxiv]

He furthermore states:

> . . . science develops best when its concepts and conclusions are integrated into the broader human culture and its concerns for ultimate meaning and value . . . Scientists . . . can come to appreciate for themselves that these discoveries cannot be a substitute for knowledge of the truly ultimate. Science can purify religion from error and superstition; religion can purify science from idolatry and false absolutes. Each can draw one another into a wider world, a world in which each can flourish.[xxv]

Nothing could be further from the antagonism of Leo XIII, born of the anticlericalism of the 17th and 18th centuries, than the following words of John Paul II:

> By encouraging openness between the Church and the scientific communities, we are not envisioning a disciplinary unity between theology and science like that which exists within a given scientific field or within theology proper. As dialogue and common searching continue, there will be growth towards mutual understanding and gradual uncovering of common concerns which will provide the basis for further research and discussion.[xxvi]

I would judge that the newest element in the new view from Rome is the expressed uncertainty as to where the dialogue between science and faith will lead. Whereas the awakening of the Church to modern science during the papacy of Pius XII resulted in a too facile appropriation of scientific results to bolster religious beliefs, Pope John II expresses the extreme caution of the Church in defining its partnership in the dialogue:

> . . . Exactly what form that (the dialogue) will take must be left to the future.[xxvii]

I consider this to be the newest and most important posture that the modern Church has taken in its approach to science. It is radically new and in complete contrast with previous history. It is diametrically opposed to accusations of atheism, to a posture of antagonism; it is awakened but expectant.

I would like to end by addressing a question which the Pope raises: "Can science also benefit from this interchange?"[xxviii] To my mind it takes a great deal of courage and openness to ask that question. I do not believe that it has a very clear answer. In fact, it is very difficult to see what the benefits to science as such, that is as a specific way of knowing, might be. In the Papal message it is intimated that the dialogue will help scientists to appreciate that scientific discoveries cannot be a substitute for knowledge of the truly ultimate.[xxix] In what way, however, do scientific discoveries participate, together with philosophy and theology, in the quest for that ultimate? This is a serious and open question. Obviously, the new view from Rome does not have all the answers, but it is an invitation to a common quest.

George V. Coyne, S.J.
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Notes

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i. Michael J. Buckley, S.J., At the Origins of Modern Atheism (New Haven:Yale University Press, 1987).

ii. Sabino Maffeo, S.J., In the Service of Nine Popes, One Hundred Years of the Vatican 0bservatory (Vatican City State: Vatican Observatory Publications, 1991) trans. by G.V. Coyne, S.J. from the original Italian: Cento Anni della Specola Vaticana, Nove Papi, Una Missione (Vatican City State:Vatican Observatory Publications, 1991). See especially pages 13-15 and 47-50. A second revised edition was published in 2001.

iii. Motu Proprio, Ut Mysticam, published in Sabino Maffeo, S.J. op. cit., p. 205.

iv. ibid.

v. ibid.

vi. See Sabino Maffeo, S.J., op. cit., especially Chapter 17, pp. 189-202.

vii. See Sabino Maffeo, S.J., op. cit., p. 35.

viii. See Sabino Maffeo, S.J., op. cit., pp. 174, 184, 185.

ix. P.J. McLaughlin, The Church and Modern Science (New York: Philosophical Library, Inc., 1957), see especially pp. 183-206.

x. Discourses of the Popes from Pius XI to John Paul II to the Pontifical Academy of Sciences (Vatican City State: Pontificia Accademia Scientiarum, 1986) Scripta Varia 66, pp. 73-84.

xi. See for example: G. Gamow, "The Role of Turbulence in the Evolution of the Universe", *The Physical Review*, 15 April 1952; and E.L. Mascall, *Christian Theology and Natural Science* (London: Longmans, 1956).

xii. For an excellent discussion of the contrasts between Pius XII and Georges Lemaître see Josef Turek, "Georges Lemaître and the Pontifical Academy of Sciences", Vatican Observatory Publications, 2, 167; see especially pp. 170-172.

xiii. Acta Apostolicae Sedis (Vatican City State: Tipografia Poliglotta Vaticana, 1952) Vo1. 44, pp. 41, 42.

xiv. R.H. Dicke, P.J.E. Peebles, P.G. Roll, and D.T. Wilkinson, "Cosmic Black Body Radiation", *Astrophysical Journal* (Chicago: University of Chicago Press, 1965) Vo1. 142, p. 414; A.A. Penzias and R.W. Wilson, "A Measurement of Excess Antenna Temperature at 4080 Mc/s", *Astrophysical Journal* (Chicago: University of Chicago Press, 1965) Vo1. 142, p. 419.

xv. G. Lemaître, "The Primeval Atom Hypothesis and the Problem of Clusters of Galaxies", in *La Structure et L'Evolution de 1'Universe* (Bruxelles: XI Conseil de Physique Solay, 1958) p. 7.

xvi. Acta Apostolicae Sedis, op. cit., p. 732.

xvii. op. cit. in Note x, p. 151.

xviii. ibid., p. 193.

xix. The message was first published in *Physics, Philosophy and Theology, A Common Quest for Understanding*, eds. R.J. Russell, W.R. Stoeger, S.J. and G.V. Coyne, S.J. (Notre Dame, IN: University of Notre Dame Press, 1988) pp. M3 - M14. Comments on the Papal message by a group of experts have been published in: *John Paul II on Science and Religion, Reflections on the New View from Rome*, eds. R.J. Russell, W.R. Stoeger, S.J., and G.V. Coyne, S.J. (Notre Dame, IN: University of Notre Dame Press, 1990).

xx. op. cit. in Note x, p. 153.

xxi. The Church=s Most Recent Attempt to Dispel the Galileo Myth, 2005, in *The Church and Galileo*, ed. E. McMullin (Notre Dame, Indiana: University of Notre Dame Press) pp 340-359.

xxii. L. Cranberg "A New Trial for Galileo", in *Physics Today* (New York: American Institute of Physics, 1981) Vo1. 34, p. 11; "Why bother to rehabilitate Galileo", in *Nature* (London: Macmillan Magazines, 1980) Vo1. 287, p. 767.

xxiii. See Note xix.

xxiv. ibid., p. M9.

xxv. ibid., p. M13.

xxvi. ibid., p. M7.

xxvii. ibid., p. M7.

xxviii. ibid.

xxix. ibid.