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Mount St. Scholastica, Atchison, Kansas
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Worship and the New Cosmology

Liturgical and Theological Challenges

Catherine Vincie, RSHM



A Michael Glazier Book

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Preface

Every generation has its challenges in life and in faith. If anything can characterize the emerging spirituality of our day, it is the desire for wholeness—taking every aspect of human life seriously as a revelation of God to us and as a means for us to respond to the living God. No longer are we content to speak of our “spiritual” lives as if our spirit were separate from our bodies, our emotions, and our intellect. Not all of us succeed in such efforts of integration, but we are convinced as never before that a holistic approach to our faith life is required. If we are becoming more aware of our bodies and emotions, we are likewise becoming more aware of the need to reduce the intellectual dissonance between our daily lives and our lives of faith. In our day, the advances in the hard sciences are providing the most challenging area of development for us to integrate into our faith life.

This book is a beginning effort to look at the growing conversation between theologians and scientists, and to apply it to our liturgical life. Systematic theologians of the last twenty years have entered this dialogue with promising results. Theologies of creation, God, Christology, and Pneumatology are all receiving attention as we struggle to integrate the New Science of cosmology and quantum physics with our belief system. At the same time, small faith communities have been taking the New Universe Story into account as they gather for prayer in retreats and workshops. At the moment, very few of these developments have found their way into the official worship of the Christian churches. As a liturgical scholar of the Roman Catholic community, I feel an obligation to bring into dialogue the work of systematic theologians, the worship of these small faith communities,

and the official worship of my community. I see this as important because not bringing the New Cosmology into our official worship runs a twofold risk: it risks alienating further those who are already on the fringes of the church, and it risks increasing intellectual dissonance for those living in a scientifically informed world and worshipping with a liturgical tradition that is increasingly out of touch with the development of contemporary science.

Accordingly, in chapter 1, I explore the challenge of the New Cosmology and possible approaches to the science/religion dialogue. In chapter 2, I briefly set out the New Universe Story at the macro and micro levels so as to give a hint of the new developments. Chapters 3, 4, and 5 are a more fulsome exposition of the work of some major theologians who are addressing this issue. Chapters 6 and 7 explore the liturgical implications of this work in terms of sacramental theology and specific worship experiences. I review some liturgical work that has already been done, and present some of my own beginning efforts to create new prayers and new patterns of worship.

Adapting our current liturgical books to integrate the New Science will take many years and will require the work of many scholars and many faith communities who are already experimenting with new prayer forms. I invite your consideration on these issues, and look forward to the dialogue required to bring this integration into reality.

Acknowledgments

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Part I

Science and Religion in Dialogue

In the twenty-first century, we live in a world that has contesting truth claims about reality. Science and religion, for example, seem to have opposing ways of relating to reality that appear to cancel one another out. Some scientists would insist that one must leave one's religious faith "at the door" of the laboratory. It is not unusual to hear that one cannot be a scientist and a believer at the same time. Science can verify its truth claims, they would say, while religion cannot. Therefore if one were to put science up against religion on a given issue, the scientific answer inevitably wins. On the other hand, some religionists would say that science itself can fall into a kind of faith (scientism), that is, the belief that science is the only approach to truth that holds any legitimacy—an idea they must reject. It is a question, then, of competing truth or faith claims. Still other religionists (biblical literalists, for example) would say that both science and religion are after the same quest for truth, but in that contest between science and faith, faith wins and the scientific answers must be rejected. If one wants to worship, one must leave the insights of the scientific community "at the door" of the church.

But what happens in the church communities that are unwilling to accept the absolute contrast or contradiction between their faith and science? What if science and religion have something legitimate to offer one another? What do mainline Christian churches do with the insights of a scientific community that has brought tremendously new and exciting

insights into the universe at the micro or macro levels? Must we live schizophrenic lives, believing and worshiping with one cosmology expressed in doctrines, prayers, or hymns while standing in amazement and appreciation at the pictures from the Hubble Space Telescope that indicate that in the known universe there are over 200 billion galaxies? Will the two worlds ever meet?

Chapter 1

The Challenge of the New Cosmology

Periodically, key new insights into the workings of the world reach a tipping point and cause a radical shift in cultural sensibilities. Even if the changes occur in one field of human endeavor, certain developments are of such consequence that their effects ripple out across the whole social spectrum. When this happens, the natural and social sciences, philosophy, theology, and the arts share the burden of adapting to the new insights and reconfiguring the human imagination in light of them.¹

We are, I will argue, at one of these historic moments, when, ready or not, we are challenged to integrate a new cosmology and an ecological consciousness into our thought, our lives, our work. This new cosmology has implications for our understanding of God, the universe, and humanity's place in it. It involves not only how we live but how we will pray as individuals and as communities. How are we to understand the magnitude of such a change in consciousness, and what are the implications for Christian theology and liturgy?

Shifts in consciousness do not happen in a day, nor is one person singlehandedly responsible for the insights that foster the emergence of such a shift. However, there are key figures and formative centuries

¹ Parts of this chapter are taken from my vice-presidential address to the North American Academy of Liturgy in 2011. It is published as "Praying with the New Cosmology," *Proceedings of the North American Academy of Liturgy Annual Meeting*, San Francisco, CA, January 6–9, 2011, 3–16.

that usher in a new vision of reality. Writing in 1992, Ewert Cousins proposed that we are at a major new epic in human consciousness.² He expressed it in Karl Jaspers's term of being at a second Axial Period in human history. By that he meant that we can understand human consciousness as generally divided into three major periods: a pre-Axial Period, the first Axial Period, and the second Axial Period. The pre-Axial Period, dating from the rise of hominids to roughly 800 BCE, was characterized as a world inhabited by tribal peoples who lived in harmony with nature, had a collective consciousness, and expressed themselves in mythic language and ritual.

The first Axial Period was from 800 to 200 BCE, peaking in 500 BCE when, Cousins argues, there was "a striking transformation of consciousness [that] occurred around the world in three geographic regions, apparently without the influence of one on the other."³ In China two great teachers emerged, Lao-tze and Confucius; in India the Vedas were superseded by the Upanishads; Buddha and Mahavira were instrumental in forming two new religious traditions; Zoroaster emerged in Persia, while in Israel the major prophets exercised significant influence. Finally in Greece, what we know as Greek philosophy developed under the leadership of Socrates, Plato, and Aristotle, among many others. This first Axial Period was a transition from tribal to individual consciousness that was self-reflective, analytic of natural and social phenomena, and addressed the individual spiritual journey into the divine. As with all periods of transition, something was lost as well as gained in this period. The negative side of the shift in consciousness was a loss in the organic relationship with nature and a weakening of tribal connections. It tended toward an alienation from our earthly roots with a propensity to look toward heaven and to reject matter in favor of spirit. On the positive side, Cousins suggested that this first Axial Period released an enormous amount of spiritual energy that was best expressed in monasticism, that is, in individuals who could set themselves on the margins of society and take a radical stand vis-à-vis the culture as they progressed on their individual spiritual journeys.⁴

² Ewert H. Cousins, *Christ of the 21st Century* (Rockport, MA: Element, 1992).

³ *Ibid.*, 4.

⁴ *Ibid.*, 7.

We are, Cousins argues, on the verge of the emergence of a second Axial Period, which began with the Copernican revolution; the transformation of consciousness of our age is that from individual to global consciousness. This global sense leads to a new awareness of unity but without a loss of distinction (in other words, a sense of unity beyond tribal ties that takes the individual into account), and a re-grounding in matter and in the earth (in other words, a new appreciation of the material with the addition of cosmic consciousness with its ethical implications). "This new global consciousness," Cousins says, "must be organized ecologically, supported by structures that will ensure justice and peace."⁵ Communities in the second Axial Period must also reappropriate the strengths of the pre-Axial Period with those of the first Axial Period and turn these resources to the contemporary problems of our age.

Clearly the world community currently consists of people living with the values of the pre-Axial, first Axial, and second Axial Period all at the same time, but this does not diminish the significance of a movement to a new consciousness that starts small but grows to a critical mass that is perceptible at a global level. In terms of history, if we count Nicolas Copernicus as the instigator of a new view of the universe (1543), we are only in the first five centuries of such an epochal change. How long it will take for this epochal change to reach a global level is uncertain, but the cooperation of peoples from all three periods in the interest of ecological reform suggests that we are well on our way.⁶

I am in agreement with Cousins in his analysis of the transition to different Axial periods, but I think that he did not go far enough in exploring the impact of the New Sciences at the micro and macro levels and the impact of a new cosmic consciousness or a new cosmology on our generation. He does suggest that with the New Cosmology and our experience of space, we are "for the first time . . . actually experiencing the Copernican universe and not merely understanding

⁵ *Ibid.*, 10.

⁶ It is estimated that there are over 20,000 individual groups worldwide engaged in ecological reform. A particularly striking example is the Pachamama Alliance based in Ecuador where indigenous peoples work with those of the developed world on ecological renewal. See <http://www.pachamama.org>.

it intellectually with the aid of an abstract model of the solar system.”⁷ This is a significant moment which has vast implications for religious experience, theology, and worship. Because of the close ties between cosmic and religious models, Cousins claims “this new experience of space will open new varieties of religious experience and give new meaning to cosmological symbols.”⁸ This is an extremely provocative statement which begs further exploration. Cousins does not explore this line of reasoning, but it is one that I hope to pursue throughout this book.

Thus far we have used the words cosmic and cosmology without defining them and it is time to do so now. What is a cosmology? In short, a cosmology is how human persons experience themselves in relation to the cosmos. It is the lens through which reality is viewed and interpreted. A cosmology tells you how things are in reality, what really matters, and provides the foundation for core values, belief systems, and moral norms. A cosmology gives a community meaning and purpose.

What characterized the cosmology of the first Axial Period was the fact that the human story was treated in an isolated manner and located in a static world. The creation stories that came out of the Axial world, of which the biblical account is one, posited the creation of humanity in a finished cosmos that was between four and five thousand years old. This was all to change in the post-Copernican, Modern Period.

The Modern Age (roughly from 1600 CE to the mid-1900s) saw a vast change in the cosmology of the Western world and, as Brian Swimme and Thomas Berry have noted, it needed to displace a long list of assumptions:

that the celestial bodies were made of material different from the matter of the Earth and follow different physical laws in their movement;

that celestial movements must be circular;

that Earth was only some five thousand years old;

⁷ Cousins, *Christ*, 50.

⁸ *Ibid.*

that the various species of plants and animals were fixed in the beginning;

that the universe was best understood as a great chain of being in hierarchical arrangements;

that humans were placed on the Earth as a temporary setting for their spiritual development;

that the most reliable source of understanding was to follow the teachings of the ancients rather than the observable evidence of the present.⁹

Because of the work of Copernicus and Galileo, the earth lost its centrality as the sun took over that position in our solar system. The relationship between humankind and nature also changed in the Modern Period. The world became understood as a vast machine over which humanity ruled. Humanity lived not with other subjects, but in a universe of objects over which we assumed more and more power and with which we had less and less a relationship. The Enlightenment brought about an understanding of the human as one who has critical reason, able through empirical observation to come to scientific knowledge. Isaac Newton's discoveries led to an explosion of technology in the Industrial Revolution, which freed Western culture from many of the burdens of human life but at a significant cost. Exploitation of the environment was the price paid for vast economic growth.

Granting the significant developments of the sixteenth century, we can speak about the New Cosmology as that which emerged in the mid-1800s and continues into the present. We cannot underestimate the impact of Charles Darwin and colleagues in their insight into the evolutionary nature of Earth and its inhabitants. Rather than a fixed notion of reality, their work suggested that we and all creatures of Earth developed gradually in an irreversible movement from simplicity to greater and greater complexity. We humans, they tell us, are related to all that came before and truly are Earth come to consciousness. What we will become is, as yet, unknown.

⁹ Brian Swimme and Thomas Berry, *The Universe Story* (San Francisco: Harper, 1992), 228.

In the twentieth century, through the work of scientists like Albert Einstein and Edwin Hubble, our perception of the world enlarged beyond the earth and our solar system to a much greater appreciation of the size and complexity of the universe. Hubble discovered there were other galaxies besides our own Milky Way; that was only the beginning of a vast series of discoveries at the macro and micro levels. Through the new sciences of astronomy and astrophysics, we are able to ask questions not just about the age and development of humanity or even of Earth, but the age and development of the known universe. We learned that time does not begin with the age of Earth, but with the first flaring forth in minute fractions of a second after there was nothing in what has become known as the "Big Bang." Space is not limited to what we can see with the human eye, but what our most developed observatories can learn about nebulae, stars, and galaxies from the electromagnetic echo they leave behind. Since Einstein and his theory of general relativity, we have come to realize that space, time, and mass are related and that the universe is expanding.

This knowledge has great implications for our self-understanding and our understanding of the world and our place within it. Rather than being a completed and static universe, the New Cosmology suggests that the universe is expanding in a sequence of irreversible evolutionary events of which humanity is a part. The human story cannot be told any longer within Earth's story; the human story is only comprehensible in the story of an expanding and evolutionary universe. The universe story is our story. As Swimme and Berry tell us, "we live not so much in a cosmos as in a cosmogenesis, a cosmogenesis best presented in narrative; scientific in its data, mythic in its form."¹⁰

In 1962 the historian of science Thomas Kuhn published a work that would prove to have significant value both to the scientific community and to many other fields as well. It was titled *The Structure of Scientific Revolutions*, and presented a way of understanding the development of modern science. In it, Kuhn introduced the term "paradigm shift" to speak of the revolutionary change that, in his analysis, marked contemporary science. For Kuhn, a paradigm was

¹⁰ *Ibid.*, 229.

“the entire constellation of beliefs, values, techniques, and so on shared by the members of a given community.”¹¹ This constellation (of beliefs, etc.) is so taken for granted by the practitioners that it is seen as the only legitimate way of conceiving the world. With time, however, anomalies develop in the use of the paradigm that beg for alternative strategies. For Kuhn, this creates a crisis in the community that steadily grows until practitioners lose faith in the existing paradigm and seek a new one that more adequately addresses the anomalies in the system. Kuhn suggests using the term “paradigm shift” to describe that movement from one set of theoretical rules and methods that no longer answer all the problems of normal science to a new set of rules and methods that are simply more successful than their competitors. Kuhn’s contribution has been to give us language to speak of broad-based change in methodology and content of many fields, and I would like to apply it here for my purposes.

While it is possible to speak of the theory of paradigm shifts with equanimity, it is quite another thing to be involved in the actual crisis that precipitates a paradigm shift itself. Faith in the new model does not come quickly or easily. Nicolas Copernicus threatened to turn his culture on its head with his heliocentric cosmology that decentered the earth as the hub of the universe. However, at the time of its publication in 1543 and until 1700, his theory was rejected by most scientists on physical as well as theological grounds. Regarding the latter, it appeared that his heliocentric universe contradicted scripture.

In hindsight such criticism can be seen as ludicrous, but at the moment of new discoveries, the science in question is neither obviously correct nor constructive. To the contrary, it seems to subvert what is taken for granted as the way things really are. Major paradigm shifts cause seismic trembling in the whole cultural world of a society. Identity comes under assault. One’s stability is upset; one’s sense of balance is jarred; one is thrust into a period of uncertainty because the implications of the new paradigm are not at all clear. In fact, the full implications may take tens or even hundreds of years to work completely through the social system. Social disorientation may occur;

¹¹ Thomas Kuhn, *The Structure of Scientific Revolutions* (Chicago: The University of Chicago Press, 1996), 175.

rebellion at the changes can be a result. The seventeenth-century poet John Donne wrote eloquently of the disorientation he experienced as a result of the work of Copernicus and Galileo.

And new Philosophy calls all in doubt,
The Element of fire is quite put out;
The sun is lost, and th' earth, and no man's wit
Can well direct him, where to looke for it. . . .
'Tis all in pieces, all coherence gone;
All just supply, and all Relation. . . .
For the world's beauty is decayed, or gone,
Beauty, that's color, and proportion.¹²

Not all feel as negatively about paradigm shifts as Donne, of course. A degree of excitement may develop as the culture sets aside the limits of older frameworks and reshapes more adequate new ones. In reality, uncertainty, instability, disorientation, excitement, and confidence might all be experienced at the same time within any single culture.

I am suggesting that we, as a culture, are facing in this second Axial Period perhaps the most challenging paradigm shift to date due to the developments in the new sciences, especially those of the last 150 years. Advances in genetics, paleontology, cosmology, astrophysics, quantum mechanics, evolutionary biology, and particle physics have all contributed to a radically new way of seeing the world and our place within it. The result is a New Cosmology. The current ecological crisis is one aspect that is addressed by the New Cosmology—the climate change debate exemplifies the struggle over a new paradigm. Our religious traditions have yet or are just beginning to take cognizance of these new studies, and as Cousins remarks, “religion cannot merely draw from their resources as they exist in the first Axial Period, but must transform them in light of the second Axial Period.”¹³ That is the seemingly overwhelming agenda that we are facing at the moment. At the level of faith, belief, religious experience, ritual expression, and theological reflection, we are called to save what is the best

¹² *The Complete Poetry of John Donne*, ed. J. T. Shawcross, The Anchor-Seventeenth Century Series (New York: Doubleday Anchor, 1967), 271–86; esp. 277–78. As quoted in Zachary Hayes, *A Window to the Divine* (Quincy, IL: Franciscan Press, 1997), 3.

¹³ Cousins, *Christ*, 11.

of our tradition while revising and expanding our horizons in light of the epochal change of the second Axial Period.

This is the challenge of the New Science and the New Cosmology at this time. It is important to note that this new story does not of itself supplant other stories that have guided humanity over the millennia. "It is rather a case of providing a more comprehensive context in which all these earlier stories discover in themselves a new validity and a more expansive role."¹⁴ It is our generation of believers who must integrate this new paradigm shift of the second Axial Period into the way we see the world, our place in it, and our religious traditions. While the Genesis creation myth was an expressive model in which persons showed forth their religious experience, it is we who must either retrieve or create new expressive models for our religious experience and consequently rethink questions of the Triune God, creation, salvation, and redemption. Where will we find these models, or must they be created anew? Cousins suggests that we need especially to retrieve and reappropriate the symbolic thinking of the people of the pre-Axial Period and, in particular, their relationship and rootedness in the earth. We in the second Axial Period must plunge ourselves back into matter and rediscover its spiritual significance. "It is," he suggests, "precisely in symbols and in the exercise of our symbolic imagination that this significance is manifest."¹⁵ I would suggest, in addition, that it is in the images from space, in particular from the Hubble Telescope, that we are finding new images that are engendering new religious experiences. On the other hand, new religious experiences are finding expression in the images of the New Cosmology.

Liturgical scholars and theologians must explore the prayer of our communities to see how we might worship the living God in light of this newly articulated Cosmogogenesis and the religious experience it engenders, even while our systematic theologians are rethinking our whole belief system. Liturgical scholars are not only scholars of what our religious traditions have done in the past and present. Some of us are responsible for the formation and modifications of denominational prayer books and ritual materials that will shape our traditions for years to come. What difference do the New Cosmology and the

¹⁴ Swimme and Berry, *The Universe Story*, 238.

¹⁵ Cousins, *Christ*, 32.

ecological crisis make to us as we shape new prayers and symbols for the Christian community? To suggest that the culture is experiencing a major paradigm shift in this second Axial Period and that we would remain untouched by it seems naïve, even irresponsible. This book is a tentative step in exploring the ramifications of this paradigm shift for liturgy.

Questions of Method

Science and Religion

As we begin our discussion of the relationship between science and theology, it is important to address how theology is to relate to ever new scientific discoveries. It is clear that theology cannot simply affirm each new scientific discovery or theory as they unfold—these are subject to change as new data and new technologies emerge. It is also true that in a tradition such as Roman Catholicism—one that has always affirmed the place of understanding and intelligibility in our faith—the quest for truth by all fields of endeavor should have a place at the table of theological discourse. We cannot simply go forward blithely oblivious to the evolving insights of our scientific community. It is thus appropriate at this time to address the various ways in which religion and science have been or could be related.

Theologian of science and religion John Haught has clarified the situation by proposing four possible ways of relating the two fields. The summary which follows is based on his text *Science and Religion: From Conflict to Conversation*.¹⁶ He suggests that in recent history (the last five hundred years) there indeed has been a stormy relationship between the two (e.g., the controversy between Copernicus, Galileo, and the church, and the more recent religious protests against evolutionary theory), but that the relationship between the two fields is more complex than one of mere opposition. In fact, there is a range of possibilities for how science and religion interact. It will be helpful to spell out in some detail each of these possibilities.

¹⁶ John Haught, *Science and Religion: From Conflict to Conversation* (Mahwah, NJ: Paulist Press, 1995), especially chapter 1. For a slightly different interpretation see Ian Barbour, *Religion in an Age of Science* (San Francisco: Harper & Row, 1990).

Conflict

In light of the scientific revolution of Copernicus and Galileo, many people, scientists and religionists alike, would suggest that the two are in irreconcilable *conflict* with one another. Part of this conflict lies in the ability of science to demonstrate the truth of its ideas while religion cannot. Science can test to see if its theories are in fact “falsifiable,” but religious positions are “untestable.” For some scientists this means that religion is in conflict with science and that one cannot be both a scientist and a person of faith. From another perspective, biblical literalists (those who take the Bible as being literally true) also see conflict between the two fields and argue that the Bible is right while scientifically developed theories such as evolution are wrong. Still others would argue that science is the enemy of religion, that “it was the coming of science that caused most of the emptiness and meaninglessness in modern life and culture.”¹⁷ Since one of the main functions of religion is to provide meaning in life, the scientific argument for life’s meaninglessness puts science and religion in irreconcilable conflict.

Contrast

Not all believers or scientists are so adamantly convinced that there exists a hopelessly conflictual relationship between science and religion. Some argue that *contrast* can and ought to characterize the relationship. In the contrast argument, science and religion are understood to operate in different arenas. Each has a distinct content and task, and it would not make any sense to compare the two. Followers of this position are content to allow each to maintain its own silo existence and in so doing, all will be well. It is an understandable effort to avoid conflict, but Haught argues that there are several problems with the contrast position.

First, there is a danger of *conflation* in this approach into which both scientists and religionists can fall. The danger is that the distinctions between the two fields are lost—science and religion are conflated into one another in such a way that their differences are not honored.

¹⁷ Haught, *Science and Religion*, 11–12.

The different content, agendas, and methods of the two fields are not taken into account. Conflation is as much in evidence today as in the time of Galileo, when the church argued that a heliocentric universe contradicted Scripture. The church failed to recognize that the Bible was not a scientific book, and that science had the right to propose a different cosmology without threatening the unique insights of biblical religion. Contemporary believers who conflate science and religious belief on the question of creation call such fusion “creation science.” Such persons in the United States have fought to introduce a biblical literalist interpretation of the creation of the world into school curriculums to counter the scientific findings of evolution that are being taught.

A second danger in the contrast position is that it does not take sufficiently into account the presuppositions of science (its “faith,” if you will). This is also a problem of conflation, in that now scientists conflate their findings with their “faith” that science is the only method for learning about the universe or seeking truth. Rather than describing this as pure science, Haught argues that this is a philosophical view that he calls “scientism.”¹⁸

A third danger within the contrast position is the effort at *concordism*. This is the attempt to “force[s] the biblical text to correspond, at least in a loose way, with the contours of modern cosmology.”¹⁹ For example, some religious scientists try to relate the six biblical days of creation with six epochs of world history.²⁰ It is an attempt to make the Bible look scientifically respectable as well as to avoid conflict, but what appears to be at least superficial agreement begins to unravel as new scientific theories develop.

Haught suggests that while the approach of contrast is in many ways attractive, it fails on two accounts. First, it does not keep the two fields distinct so that genuine conversation that respects the differences between the two fields may be had. Consequently, it does not take into account the possibilities of science and religion actually cooperating with one another.

¹⁸ *Ibid.*, 16.

¹⁹ *Ibid.*, 13.

²⁰ *Ibid.*, 14. Haught argues that physicist Gerald Schroeder does this in his book *Genesis and the Big Bang*.

Contact and Conversation

If conflict and contrast are problematic paths of relating science and religion, it would seem that *contact* would be an attractive alternative. This position does not allow the two fields to simply coexist in isolated parallel columns, but seeks to relate one to the other. An important part of this approach suggests that religion and theology cannot remain oblivious to what is happening in science, but “must seek to express its ideas in terms that take the best of science into account lest it become intellectually irrelevant.”²¹ Perhaps the best way to understand the dynamic here is *conversation*. Each field preserves its identity, but the practitioners seek to remain in contact or relationship with each other. This approach proposes that scientific discoveries can be helpful in opening up new vistas for faith in ways that were not possible before. We might also say that science can help religious faith to flourish in new ways, even as religion can help science not to exceed its boundaries in truth seeking.

Confirmation

Haught suggests that it is tempting to remain at the level of contact, but that this does not go far enough. He posits that “religion is in a very deep way supportive of the entire scientific enterprise.”²² By this he means that the presupposition of religion that the universe is intelligible is the very foundation of science’s approach to understanding reality. Thus religion would support or *confirm* science in its quest for truth or unifying knowledge. Religion would not unequivocally affirm or deny any particular scientific explanation of reality since these are constantly being modified and expanded, but it would support science’s effort to seek reality’s overall rationality. Religion, however, makes its own contribution to the search for truth. Religious myths, stories, and symbols point to an intelligibility that exceeds even our best efforts at scientific understanding, thus holding out an infinite horizon to the finite efforts of our scientific explorations.

²¹ *Ibid.*, 18.

²² *Ibid.*, 21.

Throughout this text I will be using Haught's taxonomy in that I will be speaking of how contemporary theologians are using the New Science and the New Cosmology to recast the expressions of faith that are ours. I am suggesting that contact and confirmation are the only reasonable ways consistent with Catholic epistemology to explore the relationship of science and religion. In addition to the relationship between science and religion, we also must address the relationship between theology and liturgy. It is to that topic that we now turn.

Lex Orandi, Lex Credendi

Anyone who has read in the field of liturgical theology during the past fifty years knows that the Latin tag *lex orandi, lex credendi* (law of prayer, law of belief) has been at the heart of the debate on liturgical methodology.²³ Authors, such as Alexander Schmemmann, Aidan Kavanagh, Geoffrey Wainwright, Edward Kilmartin, Mary Collins, among many others, have debated the merits and implications of putting the accent on prayer or on belief, on whether prayer *founds* belief or the other way around, on whether there is a difference between *founding* and *influencing*. Some have placed almost an exclusive emphasis on prayer founding belief (such as Odo Casel and Aidan Kavanagh). Others have argued that the lack of verb in this phrase allows one to easily invert the phrase "prayer establishes belief" to "belief establishes prayer." In fact, Pope Pius XII used the latter in his encyclical *Mediator Dei* to counter what he felt was an excessive emphasis on prayer without enough attention to doctrine

²³ Alexander Schmemmann, *Introduction to Liturgical Theology*, 2nd ed. (New York: St Vladimir's Seminary Press, 1975); Aidan Kavanagh, *On Liturgical Theology* (New York: Pueblo, 1984); Edward Foley, Kathleen Hughes, Gilbert Ost diek, "The Preparatory Rites: A Case Study in Liturgical Ecology," in *The Ecological Challenge: Ethical, Liturgical, and Spiritual Responses*, ed. Richard N. Fragomeni and John T. Pawlikowski (Collegeville, MN: Michael Glazier/Liturgical Press, 1994), 84. See also Edward Kilmartin, "Theology as Theology of the Liturgy," chap. 6, *Christian Liturgy: Theology and Practice*, vol. 1 (Kansas City: Sheed & Ward, 1988); Geoffrey Wainwright, *Doxology: The Praise of God in Worship, Doctrine and Life; A Systematic Theology* (New York: Oxford University Press, 1980); Mary Collins, "Critical Questions for Liturgical Theology," *Worship* 53, no. 4 (July 1979): 302-17.

and scripture as sources for Christian life.²⁴ The original statement of the fifth-century author Prosper of Aquitaine is technically “*ut legem credenda lex statuat supplicandi.*” It means explicitly “let the law of praying establish the law of believing,” but not all liturgical theologians understand this phrase in the precise and limited way that Prosper originally intended it.²⁵

In most recent references to the Latin phrase, what is meant is that the law of prayer is the *foundation* for the law of belief. Consciousness of this relationship has led contemporary scholars to a whole new appreciation of the liturgical life of the church as expressive of the community’s encounter with the living God (and thus *theologia prima*) and as a locus for theological reflection (*theologia secunda*).²⁶ If you want to know the faith of a given ecclesial community, observe and study the principal liturgies of the church year, letting the liturgies be your point of departure for theological reflection. While these discussions have been a way to treat what constitutes authentic liturgical theology as a methodological question, I would like to take a step back from that debate, and reflect upon the dynamic between the development of the liturgy and the development of doctrine/theology. After two thousand years of Christian living, liturgy, and theological reflection, I do not believe that we are in the position of saying that the community’s prayer always is the root of its theological reflection as some scholars would have us believe. The simultaneity of religious experience and its celebration in expressive prayer forms (liturgy) and reflection on that liturgical experience in light of tradition (theology) suggests that we need to reconsider the relationship between the law of prayer and the law of belief once again. I do not want to settle the debate on which *founds* which. I would rather explore the *influence* of doctrine and secondary theology on the liturgy.

²⁴ AAS 39 (1947): 540: “Lex credenda legem statuit supplicandi.”

²⁵ Although the phrase is stated in different ways by different authors, this is its formulation in Migne, *Patrologia Latina* vol. 50: col. 555. See P. De Clerk, “‘Lex orandi-Lex credendi’: The Original Sense and Historical Avatars of an Equivocal Adage,” *Studia Liturgica* 24 (1994): 178–200, for an analysis on the original meaning of this adage.

²⁶ See especially the work of Aidan Kavanagh, *On Liturgical Theology*.

Historically it can be shown that doctrine has shaped the church's worship practice.²⁷ Geoffrey Wainwright claims that while Protestantism exhibits the clearest example of doctrine controlling worship, Roman Catholicism has also engaged in a reciprocal shaping of worship and doctrine.²⁸ Think, for example, of how the struggles with Arianism influenced liturgical prayer; the doxology "Glory be to the Father *through* the Son and *in* the Holy Spirit" was rewritten as "Glory be to the Father *with* (*meta*) the Son, together *with* (*sūn*) the Holy Spirit" to erase any suggestion of subordinationism. At other times the magisterium has acted to modify worship such as inserting the Nicene-Constantinopolitan creed into the eucharistic liturgy. At still other points, the church reshaped its liturgy to take into account changes in Marian doctrine (which itself flowed from the community's religious experience and piety). Here doctrine clearly had a hand in keeping the church's prayer orthodox as doctrine developed.

But there are other instances when theological reflection that is not at the level of official doctrine has also left its mark on the church's liturgy. Creative members of the church community brought their talents to bear in bringing new theological developments and new expressions of Christian piety into the liturgy. Consider, for example, the thousands of sequences that were added to the eucharist in the medieval church. These poetic texts were not in the form of what we would call "second theology." They were expressive forms of piety and belief that were influenced by "second theology," among other things. Through these sequences, not only doctrine but systematic theology and piety had an influence on Christian liturgy.²⁹ From another point of view, while we can acknowledge Kavanagh's concern that liturgy is the primary place of the church's encountering God and doing its corporate business in light of God's offer of rela-

²⁷ See Geoffrey Wainwright, *Doxology*. For a consideration of Wainwright's work, see David W. Fagerberg, *What Is Liturgical Theology? A Study in Methodology* (Collegeville, MN: Pueblo/Liturgical Press, 1992), 102–36.

²⁸ Wainwright, *Doxology*, 263.

²⁹ Here I want to suggest that Aidan Kavanagh is correct in arguing that prayer *founds* belief. I would also want to expand on his suggestion that doctrine/theology *influences* liturgy—something which he does not pursue but which I intend to. See *On Liturgical Theology*, 92.

tionship, we also need to take into account that the liturgy is not the only place where the community encounters the Holy One; nor is liturgy the only place where reflection on faith happens. My interest is precisely at this point.

I am interested in asking the question of what difference the New Science and the New Cosmology is making or could make to our religious experience and to recent developments in systematic theology. That is a first step; a second step is to ask what difference these theological developments might make to Christian worship. Liturgy has always taken place within the context of a given cosmology; often that cosmology is taken for granted as the only possible way of conceiving the world and finds uncritical inclusion in the whole liturgical act (inclusive of prayers, music, art, architecture, etc.). As we have indicated above, at this second Axial Period we are at a major paradigm shift to a new cosmology, and the question of how the church might be in prayer in light of this paradigm shift needs to be addressed.