



# BULLETIN

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I just realized that this is the last message of the millennium — if we take the change as people popularly do. Therefore I ought to write something inspiring, maybe even profound. I sincerely doubt that this statement will rise to the proper level of profundity, but we can try.

It became apparent at the 31st Anniversary meeting in Chicago that the newest "big thing" may well be stem-cell research. There will come a time when the effort to clone a human from a single cell may bear fruit, as it were. "It won't happen for quite a while, will it? There are so many grave scientific problems facing human cloning." It probably won't happen in the near future. But, remember that things (in biology) have a way of happening sooner than expected. It would not be imprudent to look for some answers before the need for them is acute. Dogmatic issues are basic to human cloning and it is not too soon to start looking at them even now. Indeed, it is already late in the day to start.

We believe that Jesus Christ is the Lord of history and will guide us in arriving at these "answers." We profess this in our lives and proclaim it with our lips that Jesus Christ is the Lord of History. We should not despair, however dark the situation may appear. We should remain patient and hopeful in the present situation (the 'promises' of human cloning and the use of human embryos in research). That does not mean that we should be passive. We should continue our efforts to guide this technology, but we should not lose either patience or hope when it seems as if we have failed. Time may not be on our side but eternity is — so we believe.

As we move into the next millennium let us realize that we do so one day at a time. Although media hype surrounds the calendar change, we shouldn't forget that we will move into the third millennium since the coming of Christ one day at a time. There won't be a sudden change that will further everything or reverse everything that is familiar. Christ will come to us when He wishes. Pray and be vigilant, yes! Despair no! Our King is Lord of all.

*Robert Brungs, S.J.*

The ITEST Bulletin: Publisher, Robert Brungs, S.J.; Editor, S. Marianne Postiglione, RSM

ITEST Offices: Director, Robert Brungs, S.J.  
Director of Communications, S. Marianne Postiglione, RSM  
221 North Grand Boulevard  
St. Louis, Missouri 63103 USA



## ANNOUNCEMENTS

1. On Saturday, March, 11, 2000 ITEEST will sponsor a one-day workshop in St. Louis on the floor level ballroom of St. Francis Xavier College Church. The tentative title: *The Computer and Virtual Reality: Windows on the Inner World?* Lecturers: John Ashby, Director of the Instructional Media Center, St. Louis University, will present a paper entitled, "Computing and Covergence — Digital Data in General: Present and Future Effects," Dr. John Cross, Assoc. Professor of Psychology, St. Louis University will treat the philosophical/psychological implications and Sr. Timothy Prokes, FSE will deal with the theological issues arising from virtual reality. Invitations to this workshop with registration information will be sent to all members early in the new year. We are also inviting teachers, administrators and staff from the elementary through college level in the bi-state (Missouri/Illinois) area and neighboring area.

2. A Big Thank you to all who attended the ITEEST 30-Something anniversary four-day conference celebration at Loyola, Chicago in early August. Reports from the attendees have been very favorable. The weather was ideal (well almost), the speakers were uniformly good and the ambience of the location on the shores of Lake Michigan could not have been better. We will have a book of edited proceedings available in March or April of 2000. The title: *The Genome: Plant, Animal, Human*.

3. In October, 2000, as a follow-up to our August, 1999 conference on "The Genome: Plant, Animal and Human," we will look at the theological (mainly systematic and doctrinal) issues emerging from biological advance. This workshop will follow the usual ITEEST weekend format: Friday Evening to Sunday Noon at a location in the St. Louis area. Two Lutheran theologians have agreed to serve as theological essayists: Dr. Michael Hoy, Dean, Lutheran School of Theology in St. Louis and Dr. Carolyn Schneider, Professor at Texas Lutheran University. We are still awaiting confirmation from invited Catholic theologians. There may also be a "theological" presentation by a scientist.

4. Just a reminder! Let us know if you have received an award or recently published; we will announce it in an upcoming bulletin. Also, the editorial staff, with proper reviewing, accepts papers for publication in the *Bulletin* as well. Deadline for submission of articles for the Winter Bulletin is November 1, 1999.

5. The Interdisciplinary PhD Program in Health Care Ethics at Saint Louis University, St. Louis, Missouri will host a conference on *Genetics and Ethics* October 29-30, 1999. Among the presenters are: Karen H. Rothenberg, J.D., *Policy Challenges: Ethics, Legal, and Social Implications of Genetics*; Eric Green, M.D., PhD., *The Human*

*Genome Project and its Impact on the Study of Human Disease*; Professor Ruth Chadwick, Ph.D., *Pharmacogenomics, Genetic Screening, and Health Care*; Professor Mary Briody Mahowald, Ph.D., *Genetics and Gender Justice*; plus 16 scholarly presentations. For information contact: Professor Gerard Magill, Ph.D., Center Director, 1402 S. Grand Blvd. St. Louis, MO., 63104 TEL (314)-577-8195; FAX (314)-268-5150 or e-mail: magill@slu.edu

6. NEWS from St. Gregory's University Local Chapter of ITEEST! Aurora Salcido, student coordinator.

...[Some] activities included meeting weekly at noon where the group held movie discussions. These topics included: *Politics and Ethics, Medical Ethics and Physicians as Researchers*. During March ITEEST at SGU co-sponsored with the Native American Student Association a viewing of *The Sun Dagger*, a film exploring the theology and technology underlying the sun and moon calendar of the ancient inhabitants of the Chaco Canyon. They also meet monthly to hold a dinner discussion on Science and Theology.



(Standing) Angela Schmidt/Sr. Marcianne Kappes, CST/Robert Schardein/Yutaka Nakajima/Victor Tolman/Pamela Mangweni. (Sitting on Couch) Br. Isidore Harden, OSB/Sharon Frazee/Chrissy Smith/Joe Welch/Justin Ward. (Seated on Floor) Chuck Ackerly/Aurora Salcido/Tafadzwa Goto.

Special thanks to S. Marcianne Kappes, CST who "facilitates" this group. Could we clone her?

7. Request for review: We have a CD-ROM from Dr. Rudy Brun for review. The title is: *Christianity, Science, and Art: Toward an Updated Christian Doctrine of Creation*. Contact us at the ITEEST Offices for a copy of this CD.



Since this is the last issue of the Bulletin for this entire millennium, the editor decided to devote two issues (this one and the first of the next millennium) to "a kind of "the best of ITEST." This recognizes (but ignores) the fact that the next millennium begins, strictly speaking, with the year 2001. Look on this as ITEST's answer to the Y2K problem.

Strictly speaking, this is not a list of the finest things ITEST has done over the past 31 years. It is merely a series of excellent points made by our attendees and speakers over that time span. The editor would be the last person in the world to decide what is best in the Proceedings over the last 30-some years. If anyone would like to pick out the best contributions from our Conferences and Workshops he or she is certainly welcome to try. We might even publish the results if the editorial board were to agree.

In the meantime we would like to thank all those who presented papers at our Conferences and Workshops — as well as the attendees at those meetings. Without your help ITEST would, at best, be a mere possibility. We want to thank you, the members of ITEST, for your continued support in this apostolic and evangelical mission. The future of the church depends in large measure on it.

Fr. Peter-Hans Kolvenbach, S.J., the Superior General of the Society of Jesus, recently wrote, "*Your ministry is one with which most are not familiar. You have been a missionary for the Church in an apostolate that continues a long tradition in the Society (of Jesus). And your activity has retained an ecumenical style that has broadened the Church's presence where it would not have been without you. ITEST has become the largest and most successful contribution in the American Catholic Church that concentrates on theological and ethical discussion of the new world presented to us by science and technology. Your award winning video production [Lights Breaking: A journey down the byways of genetic engineering] alerted, ahead of its time, many good-thinking people forming committees and advisory commissions of both the Vatican Secretariat and American bishops. Certainly your ministry has been unique in the Church and in the Society.*" While this was written to an individual, it certainly applies to all members of ITEST. Thank you for your kindness, service and love.

This is not a valedictory message. ITEST continues and will continue to need your help in every facet of its work. In fact, it cannot continue without that help. We need that help to grow and we need your thoughts to make that growth worthwhile. Please continue to aid us in this, your work for the church.

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### **CREATIO EX NIHILO: PROMISE OF THE GIFT** **Remembering the Christian Doctrine of Creation in Troubled Times**

*Dr. Reinhard Hutter, a Lutheran lay person was Assistant Professor of Christian Ethics at the Lutheran School of Theology at Chicago. He is currently on sabbatical at Princeton University from his faculty position at Duke University. He studied theology, philosophy and German literature at the University of Erlangen, the University of Bonn and Duke University. He has earned an M. Div. in Germany (1986), a Master of Theology from Duke (1988) and a PhD in Theology for the University of Erlangen (1990). This excerpt is taken from Some Christian and Jewish Perspectives on the Creation, ITEST Faith/Science Press, 1991.*

In face of the rather obvious ecological crisis of our planet earth a renewed focus on a *theology of creation* seems to be timely and urgent. It also seems rather easy to approach and unfold such a *theology of creation*, since we all have so much at stake in our common survival. Our very existence is grounded in the givenness of the world and is inherently dependent upon it. So reflecting upon this very givenness of life in a *theology of creation* should be immediately intelligible. Could not a *theology of creation* be the common ground on which all religions could meet for the sake of human survival? This is the conventional wisdom followed by many theologians these days. Yet I would like to suggest that just the opposite is the case. It seems to me that the present ecological crisis makes it more difficult to reappropriate the genuine perspective of the Christian doctrine of creation in a reformulated

*theology of creation*, since the temptation to put theological reflection into the service of the obvious is almost overpowering. The result all too often is a reactive bandwagon theology: after environmentalists, scientists, politicians, philosophers etc., have pointed out and have very convincingly made the case for the ecological crisis, theologians would finally -- always being the last -- also join the choir in order to offer a *theology for or of* the meanwhile obvious ecological crisis.

Fifteen years ago when I started working as an environmental activist, my friends and I did not need a *theology of creation* in order to guide our activity, since the problems were rather obvious. At that time the more progressive among the theologians were concerned with a *theology of revolution* and it took them another decade to



discover the ecological crisis. In the meantime publications on *creation* and *nature* are legion without yet showing the kind of impact we all hoped they would have.

What could further theological reflection under the rubric of a *theology of creation* accomplish in this context? What could its task be in the face of the clear language we already find both written on every page of recent publications concerning the state of the natural world and spoken by wounded nature itself: polluted oceans, dying forests, vanishing species and the increasing overpopulation of the human species? For many, such language speaks more clearly of apocalypsis than of creation!

In this situation which calls for a profound *metanoia* of humankind, especially in the northern hemisphere of our planet, I clearly feel Christian theology also to be called to a profound *metanoia* away from recent theological praxis: a *theology of creation* is neither a solution-deliverance-system for the ecological crisis, nor is it a *via gloriosa* toward the synthesis of *religion and science*.

Rather, I would like to claim that the Christian doctrine of creation makes a very specific point: it reminds us -- in the context of the ecological crisis -- of both God's *promise* for our life and the *claim* upon our life inherent in the fact that the world is the creation of a gracious God who has not abandoned it but rather is present in it, and even more, is deeply involved in the story of God's people toward a definite future for all humankind and all of creation. In other words, the primary concern of a *theology of creation* is not the creature but the *Creator*, since in God's activity alone is rooted both the promise and the claim inherent in *creation*.

The decisive point of the Christian doctrine of creation is the claim about creation out of nothing, *creatio ex nihilo*. Especially from a Lutheran perspective it is crucial: it points out God's love and freedom and the very fact that God encounters us in a hidden way in creation and addresses us graciously in and through our co-creatures.<sup>1</sup>

Thus, the following thoughts do not intend to undermine the urgency of addressing the present ecological crisis or of being in a conversation with science and philosophy about *nature* and *cosmology*, but rather intend to put both activism and dialogue into the proper theological perspective. This and only this is the specific competency of theology, not to provide a theological rationale for the obvious, but rather to show how being creatures of a gracious God who encounters us in creation informs human life in a way which lies beyond the shallow alternative between survival and ruin.

In the following pages I would like to point out that the Christian doctrine of creation *ex nihilo* is a piece of

genuine theology in the Lutheran sense, since it is both radical consolation and liberation in one: consolation, because we encounter God's grace already in creation, liberation because as creatures we are set free for the encounter of our co-creaturely *other* as gift. Following the logic of the doctrine of creation *ex nihilo* means proceeding in a threefold pattern: theology, doxology, ethics.

## II.

The very term *creation* is a *theological* term, and intelligible only as part and parcel of an encompassing theology i.e., strictly put, the very term *theology of creation* is — if not a pleonasm — at least a tautology. *Creation* is only intelligible as *doctrine*, as part and parcel of the proclamation of the Gospel (*doctrina evangelii*), the redemptive story of God with Israel and with/in the life, death and resurrection of Jesus of Nazareth. The functional location (*Sitz im Leben*) of the doctrine is the theological, doxological, and ethical life of that community which was and constantly is created by the One whom this community confesses to be the Creator of Heaven and Earth. Taking the doctrine out of this context means rendering it unintelligible.

Therefore, in order to understand the categorical difference between the statements of a *theology of creation* and those of metaphysical reflection about *nature* or *God and world* or those of scientific reflection about the universe, it is necessary to approach *creation* from God's story with Israel and with/in Jesus of Nazareth. Thus, only if we approach God the Creator through God the Redeemer and Sanctifier do we avoid the pitfalls of both *deism* (the creator as first cause and separate from creation) and *theism* (the creator as creative principle).

In consequence, the decisive elements of a Christian *theology of creation* have to be analytical statements, derived from God's story with Israel and with/in Jesus Christ. Only this can be the particular contribution of any theology of creation beyond our philosophical and scientific reflection upon *nature*: the God who creates us anew through the *iustitia passiva*, the one who raised Jesus of Nazareth from the dead, the one who created Israel is the one who creates *ex nihilo* (Romans 4:17). The radicality and universality of God's redemptive activity implies that God is the Creator of all.

*God the Creator* is not a metaphorical construction of an understanding of God fitting our predicament. Rather, the statements of a theology of creation are an unfolding of a particular story and its reality claims. Yet these claims are eschatological by their very nature, i.e., they can neither be verified nor falsified, only testified. God will have to vindicate them. In no way does that mean that they are irrational. Rather they are informed by premises which are



not yet universally shared. Thus the statements of a theology of creation deal with the same reality with which science deals, yet they do not focus on the *nature* of this reality and its qualities, but on the One who has brought this reality into being and is present in this reality as creative agent.

### III.

As a theological term the word *creation* has a twofold meaning. Either it denotes God's act (*creare*), or the result of this act, i.e., the product of creating (creature), which is different from God and God's act. This distinction is often forgotten, especially the point that the *doctrine of creation* is more concerned with the first than the second meaning of *creation*.

The concept of creation *ex nihilo* as such is hardly biblical, despite the fact that passages refer to creation out of nothing (2 Makk 7,28; Romans 4,17; Hebrews 11,3). The term and its implicit concept were the result of a rather complex development of Christian theological reflection, especially in its wrestling with the challenges of gnosticism. In the second century ACE Theophilus of Antiochia formulated the core points of what we know from then on as the doctrine of *creatio ex nihilo*.<sup>2</sup>

Creation *ex nihilo* has to be understood as a graceful, contingent and finite gift of a God who was not in need of the world. There is no lack or insufficiency in God that needs the creating of the world to overcome it. Creation is the overflow of God's abundant love as reflected in the inner life of the triune God. *Ex nihilo* is thus a strict dogmatic predication of God. It secures God's transcendence over against the world. While the world is coexistent with God, God is not coexistent with the world.<sup>3</sup>

That way, the doctrine of creation *ex nihilo* prohibits us from at least three ways to reconcile God and world in an encompassing formula: God as ontological ground safeguarding the world's being, God as *prima causa* making all the following causal sequences intelligible, and God as

masterbuilder of the universe out of given matter. These models represent three ways of thinking God and world in a framework, which encompasses both, either on an ontological scale, or the scale of a causal continuum, or as principle of rationality for a given world.

In contrast, *ex nihilo* safeguards God's freedom over against the world. God holds *being* in being without ever becoming bound to this being by anything else than God's own promise. Thus, God's transcendence over the world is maintained. Yet at the same time, creation *ex nihilo* also maintains God's immanence in the world through God's constant actual creative activity. The tradition differentiated therefore between *creatio originans* and *creatio continua*, original creation and continuing creation.

Creation *ex nihilo* claims an original creation, an *in the beginning* for the following reason. If there is a difference between God as *creator* and *creation*, the predicate *eternal* cannot be attributed to both, but only to God. The world was created along with time, not in time.<sup>4</sup> Both time and space are functions of *creatio* and *creatura*. Yet it is important to understand that these theological statements are categorically different from scientific statements about the finite or infinite nature of the universe,<sup>5</sup> i.e., they do not favor one cosmological theory over another one. Rather, *in the beginning* is a statement about God as agent. It claims a discontinuity in God's agency. In other words, the freedom of God to become Creator. Were God by necessity Creator and creativity an innate principle of God, God would be creating from eternity to eternity. Yet the Christian tradition understands God according to the Biblical witness not as Creator *by nature* but by choice. Thus, the logic of agency and the story character of creation implies a legitimate use of the metaphor of *beginning*, which points to that discontinuity which is given with God's very act of creation itself.

*[The remainder of this article and the endnotes are available in Some Christian and Jewish Perspectives on the Creation. This volume is available for \$10.00 (for members only) from the ITEST Faith/Science Press.]*

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## CREATION AND EVOLUTION

*Monsignor Paul Langsfeld is a priest of the Archdiocese of Washington, D.C. Ordained in 1977, he served his first seven years of ministry in parishes in the Archdiocese. He went then to Rome where he served on the staff of the Congregation for the clergy for six years. During that time he worked for a doctorate in fundamental theology at the Gregorian University which he defended in 1992. Monsignor Langsfeld returned to the United States in 1991 to become professor of systematic theology at Mt. St. Mary's Seminary in Emmitsburg, Maryland. He now teaches courses in Christology, Trinity, Sacramental Theology and Theological Anthropology. He has recently been pursuing studies in the relationship of faith with science, culture and reason. (Creation and Evolution, pp. 146 ff.)*



. . . . Pope John Paul expressed the concerns that Christian theology has traditionally had concerning the scientific theory of evolution. We identified three issues. First, theology needs to understand the kind of knowledge at stake in the scientific theory and its degree of certitude in relationship to what the doctrine of creation makes known about the world. Second, Christian theology has a particular interest in the implications of evolution for human life, given the prerogatives of human beings as the image and likeness of God. Finally, the ability of Neo-Darwinism to explain the emergence of life in terms of natural mechanism alone raises a question about the place of God in the evolutionary process, and particularly, his ability to perform "special acts" as in the creation of human life or the miracles.

We examined the way contemporary theology has handled these three issues, and came to the conclusion that it is too highly controlled by the perspective of the natural sciences. While critical of Enlightenment theology, it too is highly rationalistic, leaving little room for anything other than a naturalistic understanding of even the Christian mysteries. It goes the way of the "theological functionalism" which views God as something like a "condition of the possibility" of the world. The danger in this is evident when one looks back at the cosmologies of Augustine and Aquinas and realizes how much their scientific views are out of date, conditioned by the knowledge of the day.

Theology has not had a good record in its relationship with science. It has been reactive (fundamentalism), isolationist (neo-orthodoxy), and accommodationist ("immanentist" theologians). Each of these are controlled by the presuppositions of science. Theology cannot get beyond this situation unless it has a proper sense of its own object of study and the kind of knowledge which is proper to it. In order to discover what this might be, we need to come to terms with the meaning of "mystery."

Placher points out that theology has often been guilty of invoking mystery when it cannot find an explanation for something.<sup>262</sup> Science is just as guilty, invoking a "God of the gaps" when it cannot offer a scientific explanation. Mystery, thus, has a bad name. But before modern times, mystery had a positive meaning.

The rationalistic ideal of the Enlightenment led to a dissolution of mystery.<sup>263</sup> The latter appeared to reason to be the refuge of the weak-minded who sought consolation in the darkness of feeling because they could not tolerate the light of intellect.<sup>264</sup> Mystery, then, was understood negatively as everything that remained after reason had accomplished its work, and with the advance of science, even the areas of knowledge still in the shadows could be illuminated. Theology understood the object of faith in this context as supra-rational and inconceivable, that is, in a

purely negative way. "Mystery was now an impassable boundary for knowledge, rather than the ultimate overflowing of all knowing."<sup>265</sup>

In its pre-modern, positive meaning mystery is a fullness of being and knowing, which transcends all human knowing even as it embraces it in its greater plenitude. Reason itself opens out on to mystery, so mystery need not conflict with reason. Only the Enlightenment understanding of reason regards mystery as competitive because it pretends to a knowledge "within the bounds of reason alone."

It is precisely the fullness of being that the doctrine of creation expresses as it refers us to a whole greater than nature. It is not threatened by natural modes of knowing, and even presupposes them, for creation is not God and thus has a relative autonomy. Yet the doctrine of creation maintains that the origin, sustenance, and destiny of human beings and the world cannot receive a sufficient explanation from any of the natural sciences, either singly or collectively.

In the Bible, creation is associated with the wisdom tradition.<sup>266</sup> This is no accident, for human beings and the world are manifestations of a divine wisdom which remains inscrutable, beyond human understanding. The mysterious character of the world and human beings springs from their relationship to God, who alone knows their inmost secrets. Mystery remains permanently mystery; the modern natural sciences do not dissolve it by forcing nature to yield up all her secrets. The sciences open out on mystery, not just because they come up against barriers that puzzle them, but because of the plenitude implied in mystery.

A truly "postmodern" theology has to get beyond the rationalistic ideal of the Enlightenment which remains that of the natural sciences, despite the more sophisticated hermeneutical appreciation of their discipline which some scientists have. A retrieval of the premodern sense of mystery, and not just a return to precritical ways of doing theology, would help theology get beyond the rationalism which it has taken over from the Enlightenment. Then it would not have to react to, isolate itself from, or accommodate itself to the natural sciences, but could invite them to be critical of their own understanding of rationality and to place themselves within a broader enterprise of seeking to understand human beings and the world, not just as scientists, but as sages.<sup>267</sup>

Those who believe that the opening of science to mystery leads to the end of science (e.g. Horgan) or to the use of theology to supplement science (e.g. Meyer) are equally on the wrong track. The doctrine of creation frees the world to be an object of investigation to the sciences, whose understanding of truth is determined by their



methods, but the same doctrine maintains that there is another understanding of truth not reducible to scientific categories.

In God and his relationship to the world we have to do with a mystery which cannot be grasped in terms of natural processes without turning God into the highest being in the natural order. To preserve God's radical transcendence, the divine creativity cannot be conflated with the apparent "creativity" of nature. To speak of nature as if it were permeated by a divine intelligence comes close to a deification of nature.

In human persons we also encounter mystery. Despite the modern reduction of person to consciousness, personhood in Peacocke and Mooney retains the connotations of incommunicable uniqueness and transcendence which reflect its theological origins. When personhood is said to evolve,

like everything else, from matter, the reason for this is to ensure a naturalistic explanation for the totality of reality and to avoid the specter of Cartesian dualism. Yet a "personalist ontology" need not presuppose a Cartesian dualism, nor does it feel constrained to conform *a priori* to a definition of nature. There is, instead, a plenitude of being implied in the notion of person which makes the natural categories of evolution inappropriate to articulate it. Unless it can be shown that nature is the whole of things, naturalistic explanations cannot do justice to the reality of God and of human persons.

[This set of Proceedings with papers on Evolution by Dr. Michael Behe, Lazarus Macior, OFM, Sr. Joan Gormley, Dr. Steven Kuhl and Monsignor Langsfeld can be obtained from ITEST Faith/Science Press for \$10.00 for members, \$15.95 for non-members.]

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## FROM BIBLICAL SECULARITY TO MODERN SECULARISM HISTORICAL ASPECTS AND STAGES

*Christopher B. Kaiser is Professor of Historical and Systematic Theology at Western Theological Seminary in Holland Michigan, where he has taught since 1976. He has a doctorate in astrophysics from the University of Colorado and a doctorate in theology from the University of Edinburgh. Dr. Kaiser has written several books: The Doctrine of God (1982) and Creation and the History of Science (1992). He approaches the subject as one raised in a secular environment and yet amazed by the power of the biblical story. (from Secularism versus Secularity, pp., 19 ff.*

### 5. *Phenomenological aspect - split between subject and object*

Encounter with God in the world depends on some sort of correspondence between the voice within us and the shades and hues of the world in which we live. The *secularity* of biblical life and thought presupposes that almost any object can become the medium for an encounter with the supernatural. Donkeys speak like people. People who speak to us turn out to be angels. The words that come from within us (at least from within the holy among us) have power to change the course of the nature and to call disciples. The stones of Moses, Elijah, Jesus and Francis of Assisi would be inconceivable otherwise.

Such correspondences between subject and object were called into question by changes in the views of humanity and matter, which we discussed above. But modern secularism is more than just the abstraction of personality from society and the draining of life from matter. It is the redefinition of both subject and object in opposition to each other. The *object* is deliberately defined in rational

terms that eschew all tones of personality; the *subject* is defined in pristine isolation from the environment and even from personal possessions.<sup>104</sup> There are no immediate correspondences or sympathies between the two.

The modern subject may be referred to as a *self* or perhaps a mind. But it is not the same as a spirit. A spirit exists in relation to other spirits, in a world of spirits and the spiritual forces of nature. But such spirits can only be known in some material form — experienced through the senses or in dreams. Since matter is now entirely devoid of spirit, the modern subject exists in splendid isolation much as the modern God does.

5c. The emergence of the subject-object split seems to have occurred first in response to the theoretical de-animation of matter in the 17th century. For many intellectuals, the rise of the mechanical philosophy resulted in the estrangement of the inner person from the world of matter and motion.

I find the first awareness of this estrangement in passages



of the *Pensées* of Pascal, which were written in the late 1650s in reaction to the mechanical philosophy of Descartes:

When I see the blind and wretched state of man, when I survey the whole universe in its dumbness and man left to himself with no light, as though lost in this corner of the universe, without knowing who put him here, what he has come to do, what will become of him when he dies, incapable of knowing anything, I am moved to terror, like a man transported in his sleep to some terrifying desert island, who wakes up quite lost and with no means of escape.<sup>105</sup>

Of course, Pascal found personal faith and at least some comfort in God and in Christ (so his *Memorial*). But his God was now a strictly personal God, not the God of the philosophers or the Logos of the mathematics which Pascal had himself studied so assiduously in his earlier days. *L'esprit géométrique* was of no use in ethics or theology; for that one had to develop the quite different *esprit de finesse*.<sup>106</sup>

The popularity of Pascal among evangelical Protestants and Catholics today stems from the fact that he experienced God and described his experience so vividly in terms of the modern, secular reality in which we also live. Faith in the modern world is not weaker than it was in the traditional world of biblical secularity. If anything, it is more intense precisely because it is defined over against the world of science, technology and commerce. Whatever the gain in intensity, there is a loss of the subject-object unity that characterized biblical secularity.

Other examples of a widening chasm between the realms of subject and object could be cited. A series of theologians from John Smith to Friedrich Schleiermacher made theology a matter of inner consciousness rather than objective knowledge. A complementary series of philosophers from John Locke to John Stuart Mill made all reliable knowledge a matter of rational judgements based on verifiable sense experience and differentiated it from imagination and enthusiasm. This leads us to consider a further stage of development.

5d. The 18th century made two principal contributions to the subject-object split: the discreditation of all subject-object correspondences and the Romantic reaction to mechanical science and neoclassical art.

At first, claims to subject-object immediacy were disparagingly portrayed as the result of fraud and fanaticism. Then, toward the end of the 18th century, they were rationalized in terms of quasi-scientific constructs like animal magnetism. At the same time, many popular beliefs and

practices were collected by elites and marketed under the heading of *folklore*.<sup>107</sup>

*Folklore* is the modern term used to refer to regional traditions inherited from a premodern world.<sup>108</sup> In earlier times, these traditions were highly credible. Institutionally supported elites might try to systematize or reform or even repress the ideas of magic and astrology, but they accepted the underlying premises. But, as the mechanical philosophy became more influential, a gap was opened between the new ideas of the educated elite and traditional folk beliefs and practices. Any suggestion of real, immediate relations between inner consciousness and external events became a sign of ignorance or even fraud.

The Romantics were one class of elites who developed a genuine sympathy with folk traditions. The English longed for chivalry and the intimacy of Chinese gardens; the Scots celebrated Highland traditions, and the Germans collected myths and fairy tales. There was quite a market for books, poems, and songs on these subjects. In fact, Romanticism itself rapidly became a commodity, a marketable form of self-discovery and rejuvenation that compensated for the rigors of busy schedules. Whether we are Anglicans singing Blake's *And Did Those Feet In Ancient Time* or New Englanders reading Thoreau's *Walden* (to name two of my own favorites), we are stirred in our hearts and enabled to re-exert ourselves in a world of objects and schedules. Far from being an exception, a commodified Romanticism is essential to the modern secular world in which subject and object must be kept apart lest the spirits are heard to speak again and the real business of life be slowed down.<sup>1</sup>

5e. But, again, modern secularism is not just a matter of philosophers like Pascal and Mill or Romantics like Blake and Thoreau. None of these developments would count for much if there had not been a systematic separation of work from community as a result of the discipline of the factory.

As Peter Berger and his associates have shown us, we are doubly socialized. Passing through the portals of our workplaces, we enter the objective world of mechanical production and mathematical time. Upon re-entering our homes and churches, we are reconstructed in terms of personal relations and religious beliefs.<sup>2</sup> (There is also an *intermediate state* called commuting, but its sociology has not yet been worked out to my knowledge.) I use the term, *intrapersonal pluralism*, to refer to this subdivision of the individual's life-world.

It is no longer a question of consciously thinking about mechanics (Descartes) or locating the self (Pascal). The separate reality of each is a fact of modern life. In everyday life, we hardly notice the discrepancies; so we need sociologists and philosophers to point them out to us.



[This set of Proceedings with papers on *Secularism versus Secularity* by Dr. Richard Blackwell, Dr. Helen Mandeville, Fr. Bert Akers, S.J. and Mr. William Bentley Ball, with an

Appendix by James Childs, Jr. can be obtained from ITEST Faith/Science Press for \$10.00 for members, \$15.95 for non-members.]

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## A SEMINAR WITH FATHER STANLEY JAKI The Cosmological Question

*Father Stanley Jaki, OSB, a Hungarian-born Catholic priest of the Benedictine Order, is Distinguished Professor at Seton Hall University, South Orange, New Jersey. With doctorates in both theology and physics, he has for the past almost 40 years specialized in the history and philosophy of science. The author of more than thirty books and over 80 articles, he served as Gifford Lecturer at the University of Edinburgh and as Fremantle Lecturer at Balliol College, Oxford. He has lectured at major universities in the United States, Europe and Australia. He is a member of the Pontifical Academy of Sciences, membre correspondant of the Académie Nationale des Sciences, Belle-Lettres et Arts of Bordeaux, the recipient of the Lecomte du Nouy Prize for 1970 and the Templeton Prize for 1987. He has written, among others, The Purpose of It All, God and the Cosmologists, The Savior of Science. If you wish to pursue some of the ideas Father Jaki has discussed, these volumes will be very helpful.*

I intend to discuss three topics with you today and tomorrow. The first topic, in my estimation, is the contribution which modern scientific cosmology has made to the cosmological argument....

When we recite either the Apostles' Creed or the Nicene Creed, we state a series of propositions which we Catholics or Christians believe. The Nicene Creed is the only common platform which exists from the cultic viewpoint among major Christian denominations. If we look at the Nicene Creed or the Apostles' Creed, we find there a series of propositions in which we are asked to believe. No arguments. No compromise. We either believe those propositions or we don't.

There is one subproposition in the Creed which is not submitted as an object of belief. Have you ever thought of that? Probably not. Don't be surprised if you haven't, because I didn't think of it for many years. It dawned on me only about five or six years ago. Then I gradually realized that sooner or later I would have to deal with it....

That subproposition about which I am speaking is found at the very beginning of the Creed: "I believe in God, the Father almighty, maker of heaven and earth, of all things visible and invisible." After that statement come the various propositions concerning salvation history — incarnation, redemptive death, resurrection, ascension into heaven, judgment, the resurrection of the body, and so on. These are all propositions to be accepted on faith. We do not accept them on blind faith; but ultimately these propositions cannot be demonstrated empirically or even simply philosophically.

But the proposition about the Father almighty is riveted on the subclause that He is almighty. Almighty! That word "almighty" is *Pantocrator* — in the Greek it is *παντοκρατορ* — that who creates *to pan* (το παν)....

I mention the word *to pan* because it denotes the universe in what seems these days to be a little known Greek usage. It clearly forms part of the expression *pantocrator* in the Greek. The literal English translation is "almighty." In English it is written with one "l". That already cuts it down more to our size. Almighty — we say it so often that we hardly ever advert to what it really means! But in Greek it comes out very emphatically; *to pan* means "the universe." In both Aristotle and Plato we find that time and again *to pan* is used to denote the universe.

There is another expression, "cosmos," which is not so expressive because it has the meaning of universe only in a derivative sense. The original meaning of cosmos was "beautiful" or "beauty." Now, as we say in the Creed, we have to believe in the Father who makes, who creates all. By what looks like an accident to some, or even to most, students of the history of the Creed, "the maker of heaven and earth" got into the Nicene-Constantinople Creed. Nobody is quite sure how it got there. But it is there and I firmly believe that things never happen by chance. I do not accept that there is such a thing as chance. It is just a hollow word like randomness. It is good for mathematicians as long as they do not want to touch reality. At the very moment we accept chance in an ontological sense, our world evaporates.

"The maker of heaven and earth" is a Hebrew expression equivalent to "the universe." In other words, we have to



believe in the maker and the creator of all, in the maker of heaven and earth. But as far as I can read the Creeds, we are not asked to believe in the heaven and the earth. We have to believe in the maker of the heaven and earth, but not in heaven and earth. In other words, in the cosmological argument, the first thing is to prove that there is such a thing as the universe which is the totality of things. It is not the total number of galaxies observed by science, it is not the total mass included in a particular cosmological model, because we can never be sure that any particular cosmological model covers everything. Physical science is a field in which everything is exact and the "everything" is still to be demonstrated.

Don't take this as a sacrilege, because this is just plain truth. It is very dangerous to say this in a typical worldly gathering of scholars, however, especially if they are scientists. Scientists by and large simply do not know anything about the limitations of the scientific method. I do not think that there is anyone in a group of intellectuals so vocally ignorant about the limitations of its method as a typical physicist. I'm not talking about chemists because chemists do not really exist any longer. Chemistry now is a branch of physics.

Of course, psychologists or sociologists who try to be as exact as physics can only do this at the price of losing psychology and sociology, or at least the best and most significant part of sociology and of psychology....

So let's get back to the universe. How do we prove that there is a universe? Well, at this point I'm not going to deal with such a proof to any great extent. Let me go on to the next point, namely, the point about Immanuel Kant's strategy in the *Critique of Pure Reason* so that you may understand the enormous cultural importance of the question.

Just a few days ago I read through a book by a Spanish-born British philosopher whose name is Bernadote. The title of his book is *Infinity*. In it he asked some very telling questions about Immanuel Kant and he says that Immanuel Kant (1724-1804) is the first western philosopher in whom the reality of the universe is called into doubt. This, however, is not exactly true. Certainly it was central to Kant's ideological strategy to cast as much doubt about the universe as was rationally possible. But long before him, Ockham (d. ca 1350) made some very strange statements about the universe. Hobbes (1588-1679) explicitly stated that 'the universe' is a mere word. This is the Empiricist tradition which culminated in Hume (1711-1776). If we read his last book of natural theology, towards the end of it we see that he states very clearly that our notions of the universe are no better than the products concocted in the entrails of spiders. That's not much, although those spiders can produce some absolutely

marvelous nets. Hume did not seem to realize even that.

Hume's knowledge of science was ridiculously small, and Immanuel Kant's knowledge of science was no greater. Nonetheless, if we read the *Encyclopedia Britannica*, we will find statements that both were the earliest great scientific philosophers who really turned philosophy into a discourse that was scientifically respectable. It has become a cultural cliché that Kant was an expert in Newtonian physics. I would dare face any impartial academic court and propose that Kant's knowledge of Newtonian physics was not greater than to allow him to read the first pages in Newton's *Principia*. I think he would have probably given up on the third page. Kant did not know more about Newtonian physics, or physics or mathematics in general, than a typical sophomore in a better grade American high school....

If you know something about continental education, you know about the continental gymnasia, which Immanuel Kant attended. I doubt that his knowledge of mathematics and physics was superior to anything given to high school freshmen or sophomores. In other words, he knew pitifully little about science. The story that he developed expertise about Newtonian physics from his teacher, Martin Knutzen at the University of Königsberg, is merely a legend because Knutzen was also largely ignorant about Newtonian physics. This can be proven by reading Knutzen's articles. This, by the way, is not easy. One has to do an awful lot of footwork to find those rare German periodicals. They are, however, available if a person works.

Now that we have 'demolished' Immanuel Kant, the scientist, what can we do to Immanuel Kant, the Christian? Well, we were all raised in the belief that Immanuel Kant at least was a Christian to the extent that, although he did not believe in a rational approach to God, he nevertheless allowed an emotional approach to God, namely, the approach through the voice of conscience. You remember, I think, his statement at the conclusion of the *Critique of Practical Reason* that a look at the starry sky and the voice of one's inner conscience speak louder than words about the existence of God. He was not sincere when he wrote those lines. Furthermore, he was certainly not consistent.

If we read the old and good biographies of Immanuel Kant, we discover that at the tender age of 19 he was called in by the Rector — I think his name was Schultz or Schulz — at the University of Königsberg. The Rector asked him point blank, "Herr Kant, do you believe in God?" This was the kind of reputation he already had as an undergraduate.

He came from a very pietistic Lutheran family. The devotions were overemphasized. He had an urge to climb the social ladder and in the process he distanced himself from



his family....

Let us consider, then, a little background about Immanuel Kant's motivation about writing the *Critique of Pure Reason*. The motivation blossomed into full course when in 1762 Immanuel Kant received in the mail a book from Paris. The book was *Julie* by Rousseau. By current standards it was an innocent novel. In a single issue of the *New York Times* or *Time Magazine*, we find far more salacious details than in the whole 500 pages of *Julie*. But at any rate, *Julie* was about the total emancipation of man from transcendental shackles. It sounds very modern, doesn't it?....

*Julie* was the emotional deliverance of Immanuel Kant. After reading it he felt that he became the emancipated man of the Enlightenment....

At the end of the 1760s Kant began to crystalize in his own mind his life's vocation: to do on the strictly intellectual level what Rousseau had achieved on the emotional level, namely, the total emancipation of man from transcendental shackles. Man is his own master — this is the principal proposition of the French Enlightenment — and not accountable to anyone.

Here we find Kant's genius. He was a bad philosopher but he had a philosophical genius for devising an excellent strategy for his purpose. He saw that it was all important to destroy the rational approach to God. He sums up his strategy in the antinomies of the *Critique of Pure Reason*, the first and the second of which relate to cosmology, to the universe. He says in the first antinomy that we cannot establish whether the universe is finite or infinite; we cannot establish whether the universe is atomistic or continuous. Thus the universe must be declared to be the bastard product of the metaphysical cravings of the intellect.

If, however, the universe is the bastard product of the metaphysical cravings of the intellect, we cannot use it as our metaphysical and epistemological jumping board towards the inferential recognition of the creator. The tragedy is that this argument was swallowed hook, line, and sinker during the following seven or eight generations. Invariably we find in mid-20th century literature that the cosmological argument was demolished once and for all by Kant. In Kant's time, Mendelssohn, that great emancipator of German Jews, a very liberal man, called him "the great destroyer," or something like that. It appeared from that moment on that rational men did not have to believe in God. If people believed in God, it was either on the basis of emotions or for some other practical reason. But, mind you, if we believed in God only on the basis of emotions, we could not challenge another person to have the same emotions. In other words, if the cosmological argument is destroyed, the rational ground on which we can talk ra-

tionally about the propositions of faith is also destroyed.

Let me note that Fr. Keefe and I both use the word "cosmological," but we each use it in a very different sense. I gathered from those exceedingly learned two volumes of Fr. Keefe (*Covenantal Theology*), that he uses the word 'cosmological' as something that leads people to pantheism, to naturalism. There is a good deal of reason for using it that way, but here I'm using the word 'cosmological' simply as a reference to the universe as an objective entity, as an objective totality. The cosmological argument, then, is an argument which takes its starting point from the objective reality of an absolute totality of things and it establishes certain specifics, certain characteristics, about that totality that impel the mind to go beyond the universe for an explanation. That is the sense in which we are dealing with the universe; this means that we deal with *to pan*.

We cannot go from one universe to another universe.... Suppose there are two universes — why not? We can suppose anything we want.... Suppose there are two universes. In that case, we have to decide whether the two universes are in physical interaction or not in interaction. If the two universes are not in interaction, we can simply forget, for the purposes of science, the one which does not include us. In science we always deal with interactions. Things must interact with our eyes, with our observational instruments. If they don't interact, they don't exist for science.

But, indeed, there is another conceptual possibility. Suppose that the two universes are ruled by two totally different sets of laws. Again in that case the possibility of interaction is destroyed....

Our question is whether we can establish features about this totality which will lead us to make the inference that beyond the universe there has to be a creator. In this respect we find that modern scientific cosmology is a tremendous help. First, again in order to appreciate the argument, we have to consider two historical phenomena. One is the so-called Newtonian universe. In reality, it has nothing to do with Newton. The idea of a Newtonian universe was "created" long after Newton. "Create" is a word which should not be used except in reference to God; it is one of the most abused words of the modern western world. Perhaps I can talk about that later....

The Newtonian universe is infinite in three dimensions, homogeneous. Stars and galaxies are homogeneously distributed in it throughout infinity. Such a universe cannot exist physically. It has a gravitational potential which is infinite. When the gravitational potential is infinite, the physical system cannot exist, but I do not want to go into technical details here.

The other thing is a historical point: Newton himself



firmly believed that the universe was finite. This is very clear from Newton's early writings, which he never repudiated. It is also very clear from two, in this respect, unimpeachable sources, Addison, the editor of the *Spectator*, which was the great literary magazine throughout the early 18th century, and Voltaire (1694-1778).

In 1714 Addison wrote two papers — Newton was still alive and mentally competent. Addison himself was a member of the inner coterie of Newton. Addison would never have written those two papers in the *Spectator* had he not been absolutely sure that Newton would approve of it. Otherwise it would have meant the end of Addison in Newton's circle and probably the end of the *Spectator*. We must remember that Newton was a tremendously powerful figure during the last 20 years of his life. He was a celebrity to such extent that people who went sightseeing, say, from France or the Netherlands or from elsewhere to England, wanted to see Newton; he was, as it were, a prime sightseeing attraction. Not everybody could see him, but everyone hoped they might have such good fortune.

Addison wrote in those two papers that, as Newton has clearly shown to us, the material universe, the universe of stars, is finite and is surrounded by an infinite space. Remember, space doesn't exist — in that it's like chance or randomness. It is not a container. To that extent Newton was logical. He kept saying that, when he spoke of space, he meant the sensorium of God. It was a metaphysical entity. Now, how could a sensorium of galaxies be justified theologically or metaphysically? That's another matter. The point I want to make that, whenever Newton spoke of the infinity of space, he did not speak of something that could be reduced to the ordinary physical level.

Voltaire went to London in the mid-1720s, conversed with Newton and came home with the absolute conviction that, according to Newton, the universe was finite. Later on Voltaire published his first scientific book, *The Elements of Physics*, in which we find this extraordinarily revealing statement — I'm quoting verbatim — "According to Newton and reason," in that order, "the world is finite."

I mention these details to clear the deck completely about the intellectual history involved here, the scientific history of the 18th century. I do not know of any intellectually respectable author during the 18th century who would have stated (*pace* young Kant) that the universe was infinite or would have stated that the Newtonian universe was infinite. This 'universe' is the creation of the 19th century.

You're aware of how things happen in intellectual history, when two or three generations go by: history is not researched, it is created. This goes for political history as well. Then another two or three generations go by and it's discovered that there's a tremendous discrepancy between

the historical record and the inherited doctrine. At that point, people begin to write wonderful doctoral dissertations, debunking the immediately preceding two or three generations as woefully stupid in concocting intellectual history on the basis of pure imagination. They go back to the sources. They get their PhDs and end up in well-endowed chairs.

What is the chief characteristic of the "Newtonian" universe? It's an ideological construct. Its chief characteristic is its homogeneity. When we get homogenized milk, it's far from homogeneous. Certain elements are broken up into all sorts of molecules, some heavy fat molecules, and so on, but the rest is exceedingly variegated, inhomogeneous, as any chemist would tell you. We take it for granted that the milk, or whatever, is really homogeneous, but we trap ourselves if we do. This is what happened with regard to the homogeneous Newtonian universe. I'm talking now as an historian of ideas. But, if something is very homogeneous, what happens? We don't ask any questions about it. Not only that, if we do ask questions about something, all those questions are predicated on the notion that the thing is not homogeneous.

If we go to a clothing store, we do not buy homogeneous clothes. We look for inhomogeneity everywhere. In fact, we glory in the fact nowadays that we live in a pluralistic society, one which is far from homogeneous, which is variegated. When something is truly or apparently homogeneous we do not really care about it.

Then a second thing happens. When we get accustomed to this intellectual laziness of not asking questions when we should be asking them, then we begin to think that this supposedly homogeneous thing has no need for a cause. Since no questions need to be asked about it, it doesn't appear to need a cause. This is why both the idealist Hegelians — the Hegelian right and the Hegelian left — today's elite, propose as a basic tenet that the infinite universe exists of necessity.

Herbert Spencer more than anyone else influenced the thinking of the second half of the 19th century in this regard. He was marvelous writer. Nonetheless he was an exceedingly poor philosopher. Still, some of his contemporaries considered him to be the greatest philosopher ever. If any of you want the proof of this, read the autobiography of Charles Darwin, who himself was an exceedingly poor philosopher. He speaks in his autobiography of Herbert Spencer as the greatest philosopher ever. No wonder that *Origin of Species* is full of saltations in logic, though a marvelous science.

This is the background against which we have to see the import of 20th century scientific cosmology. We are now around 1900 in our discussion; the universe is infinite, it



is necessarily infinite because it is homogeneous. No further questions are asked. The only people who struggled against this terrible intellectual juggernaut were the writers of scholastic cosmologies, many of them from the Society of Jesus. Then Einstein in 1917 published the fifth memoir of his general relativity in which he proposes for the first time a scientifically contradiction-free treatment of gravitationally interacting things in a central field of force obeying the inverse-square law. All these three elements are important: gravitationally interacting things in a central field of force obeying the inverse-square law.

The strangest thing about this, perhaps, most important paper published since Newton's *Principia* was how very few people examined what had happened and understood it. Certainly the writers of scholastic cosmology didn't understand it. If they had kept reading a little bit of the literature on the history of science, they would have found a very interesting statement by a prominent British mathematician, named Clifford, in 1874. He was professor of mathematics at the Imperial College in London. Two years earlier, a half-genius, half-crackpot, German astrophysicist named Zöllner, published a book on the tail of comets. That something was wrong is seen in Zöllner's statement that the tail of comets was the basic form of matter. Suddenly, in chapter 9 of that book — out of the blue, nobody knows how — there's a dissertation on four dimensional cosmology. This chapter is totally different from all the rest. In that section, Zöllner surveyed the physical problems of the Newtonian universe, the gravitational problem especially, and the optical problem. He says that this situation can only be remedied if we apply four dimensional Riemannian geometry. Ten years earlier — in 1853, if memory serves me well — Riemann, a professor at Göttingen and one of the greatest mathematicians of the 19th century, had proposed that we have to fall back on four dimensional geometries, if we want to make any advance in cosmology. Then, in 1900, the older Schwarzschild who died in 1916 on the Russian front, an astronomer of first rank, published an article in which he discussed the Milky Way in terms of four dimensional geometry, evaluating its curvature and its total mass. In short, Einstein did not come onto the scene like a meteor, out of another universe.

Of course, Einstein may have known about these things only through the grapevine. He certainly never made any references to his predecessors. Still, historians of science know that he had predecessors. General relativity, nonetheless, was far superior to previous applications of four dimensional geometry in cosmology. General relativity is a closely knit physical system with marvelous propositions and consistency. This is the tremendous value of Einstein's paper because it inspired an enormous amount of work on scientific cosmology which still goes on. I doubt that there has ever been a scientific paper more influential than the

paper Einstein published in 1917.

As early as 1874 Clifford said that Zöllner's work, that is, the application of four dimensional geometry, had a tremendous philosophical significance. What was that significance? It was significant because in Clifford's mind it restored the notion of the universe to intellectual respectability. If we realize the fact that Clifford spearheaded neo-Kantianism in England at that time — in 1874 — we can understand better the tremendous cultural or ideological weight of this remark.

When I unearthed that statement of Clifford about 20 years ago I could not believe my eyes. I hadn't seen any sources which had hinted at this. Still no one can read everything. For example, I just received a thick reprint from the Sorbonne on the gravitational bending of light, its whole history. There are many references to my works and then one critical remark, that Jaki expresses astonishment that in the literature of general relativity there is practically no reference to Zöllner's work in 1801 on the bending of star light, in gravitational fields. Then the author Eisenstaadt at the Sorbonne adds, "Well, of course, Jaki did not read such-and-such French book." No one can read every English book, let alone every French book.

At any rate, I wondered why Clifford's 100 year old statement had never been repeated or referred to in the literature. Perhaps it would have been referred to, if the Jesuits of 80 years ago had cultivated the history and philosophy of science. But they didn't. I'm not saying this as a reproach because nobody among Catholics did it. There was only one who did, Pierre Duhem, whom I will consider in our third discussion. It's a shame that no one spotted this gem and used it against the Kantians and neo-Kantians as well as some of the transcendental Thomists.

We are now approaching 1920 in our historical consideration. Einstein restored the intellectual respectability of the universe. In other words, after 1917 — to put matters in a practical perspective — it would have been terribly difficult for Kant to come up with the *Critique of Pure Reason* and with its first and second antinomies. It would have been very difficult for him to say that we do not know whether the universe is finite or infinite, atomistic or continuous, and therefore scientifically unrespectable and theologically useless, et cetera. In that case, at least he would have been laughed off the stage in the scientific context. This would have hurt Kant most, because his chief aim was to wrap his anti-religious, anti-metaphysical, and anti-Christian strategy in scientific references.

After 1917 it would have been very difficult for him and, indeed, if we read the great books by neo-Kantians after 1917, Cassirer, for instance, we are struck by the fact that these people hardly ever say a word about Einstein's cos-



mology. Isn't it strange? These people think that silence is the best strategy. This is what is happening in academia. Professors by and large do not speak of things they know, but only of things they believe in, things to which they are committed. This is the case at Harvard, at Yale, Princeton and all the lesser universities as well.

So, I would say that, at least until about 30 years ago, Catholic universities were far superior in intellectual standards than secular universities. In Catholic universities there was a sustained attention to the opponents' views. These views were discussed at length, whereas in secular universities there was (and is) hardly ever a mention of the opponents' views. There certainly isn't any such discussion nor has there been for the last 20 years. Let me illustrate this with a story.

Last spring I lectured at the University of Chicago and some students drove me from the airport to the University. During that half an hour ride I heard an earful about the various professors. It was interesting to hear that one of them, a so-called great Aristotelian — there are, by the way, many pseudo-Aristotelians — who try to save human values by directing attention to Aristotle. The substance of the students' report about that professor was that Aristotle is the last word. Thomas Aquinas is brushed aside in a single line. Thomas' whole merit, according to that professor, was that he made Aristotle known for the medievals. This is worse than ridiculous, but it is an illustration of the intellectual and cultural skulduggery that goes on in various departments of top universities. In my third talk, about Duhem, I'll give you plenty of examples of this.

So let's return to the neo-Kantians, Cassirer and others. These people gloried in their being specialists in general relativity or in modern physics and so forth. People believed them, but they knew very little about the business. Thus in Cassirer's discussion about the notion of substance and Einstein's theory of relativity, there is not a single word about the universe. If there is any substance, it is the universe. This is why Immanuel Kant tried to knock over the universe because he knew that, if he let substance in, his whole carefully constructed edifice would crumble.

So much about the background. Einstein restored the scientific respectability of the universe. In general relativity all permissible paths of motion are curved. None of them can be strictly rectilinear. So the total set of these permissible paths of motions, if we circumscribed them with a dotted line, is the so-called total space. Remember, this is a pure mental fiction. Space is not touchable. These permissible paths of motion are fictions of mathematical physics. They are not strings or that type of thing.

It is the masses of real matter that generate the curving permissible paths of motion. Their totality is the net which

is called the space of general relativity. Finally, total mass has to be finite. The finiteness of mass can be estimated from the average density of mass in the universe. We can ask the question, why so much and not more? This is a purely scientific question, not yet a metaphysical question. Also, there is still a restriction that, no matter how reliable this cosmological model is, it cannot stand as a final reply to the question whether this represents the absolute totality of mass. So that if Immanuel Kant were alive today and had studied general relativity carefully — this is most unlikely because it is not an easy subject — he could still have an escape hatch by appealing to the inadequacy of the model. Some agnostic scholars like Munitz heavily rely on this escape hatch.

There is a difference between a cosmological model and the absolute totality of mass. Since these people say that we cannot empirically evaluate with absolute certainty the absolute total mass, we cannot use that absolute total mass as a stepping stone to infer the existence of the creator. I shall come back to this later. First, let me go through those specifics which in my estimation can be used in the whole scientific cosmology to support, to strengthen, the metaphysical cosmological argument.

The first thing is that general relativity restores intellectual respectability to the universe. Kant, as I said, undermined that respectability. General relativity restores that to an extent which would be very bothersome for Immanuel Kant.

The second — and please note this carefully — is that, when we argue, we always argue in a given cultural context. We never argue in a vacuum. Thus, we have to keep in mind these different ingredients in the status of the argument because, if we do not spell them out explicitly, they are going to annoy us indirectly, implicitly.

The other part of the background which must be considered is the so-called Laplacian nebulosity. We all have heard about the so-called Kant-Laplace theory of the evolution of the solar system which is the invention of some German chauvinists around 1860 or 1870. The theory as formulated by Laplace has nothing to do with Kant. Kant's cosmogony is nothing short of madness from start to finish. The paperback edition of my translation with notes and the hundred page long introduction of Kant's cosmogony will come out probably within two more months. Kantians are still angry with me, because that study exposed once and for all those who want to insist on Kant's scientific respectability.

We are in an age of science. If we can show that the philosopher who laid claim to some scientific respectability is woefully ignorant of science, we can for all practical purposes finish him off. His effectiveness is gone. This is what I tried to do with respect to Immanuel Kant. If we start



with arguments about exceedingly refined distinctions concerning this or that statement of the *Critique of Pure Reason*, we are lost. We shall never get to first base, let alone hit a home run. So much about the strategy.

As to Laplacian nebulosity, it is, as you might expect, the brainchild of Laplace. He first proposed this theory in 1796 and he refined and embellished it four more times during the remaining 30 years of his life. Thus, there are five forms of Laplace's cosmogony. But all of them start with a so-called nebulous fluid about which Mr. Laplace and all the 19th century knew only one thing — that it was nebulous. That's not much. Suppose on a very foggy winter day we go down the bluffs to the Mississippi River. We stand on the bank and the fog just keeps coming, coming in on us — the same fog. Let's stay there for an hour or two or three. After four hours or so we begin to feel that we're alone in the universe. This is a very good way to wind up in the insane asylum. This is solipsism. This is precisely the effect of getting all wrapped up in Laplacian nebulosity. We are simply to assume it and never ask any questions about it. Finally it becomes self-explaining, but only up to a certain point. If, indeed, that nebulosity is truly homogeneous in the first place, how on earth can we derive this extraordinary degree of inhomogeneity in the actual universe. We cannot have it both ways. The starting point must be specific if we want the kind of specific outcome which is our universe.

Now we come to the second enormous contribution of modern scientific cosmology. This contribution begins in 1965 when the 2.7° Kelvin background radiation was discovered. Do you know how this happened? In the late 1950s and early 1960s it was clear that all long-distance telephone communication, would in the long run utilize satellites. In order to assure good telephone communication, all background radiations, disturbances, had to be identified. It was necessary to know what wave lengths had to be avoided, what channels had to be bypassed. Two Bell Laboratory physicists, Penzias and Wilson, were in charge of detecting these possible disturbing radiations.

They checked the moon, the sun, the galaxy. They checked this and that until they had eliminated all the possible sources, but there still was one kind of background radio noise that was coming in. So they built bigger and bigger antennas, but this particular radiation noise kept coming in. As a last resort they looked into their big horn antennas and they found it full of pigeon droppings. They went to the local hardware store, got several gallons of detergent. They cleaned the inside of the horn antenna. After the cleaning the radiation came in even stronger.

So that seemed to be the end of it. They absolutely did not know what they were observing. They did not have the slightest inkling what was going on. This material is very

important, as you will see immediately. In despair they called up the Princeton cosmology department. Fortunately, they got the right man on the phone, Professor Peebles. He said: "Oh, you've discovered the cosmic black-body radiation." "Why are you so surprised?" Wilson asked. "Because I had just given a lecture about it three weeks ago at Johns Hopkins University," Peebles replied. He had derived theoretically and predicted the 2.7° Kelvin background radiation. Penzias and Wilson without knowing anything about his work discovered the background radiation. Penzias and Wilson got the Nobel Prize — an illustration of the fallen world which Fr. Keefe talks about. The scientific life is full of people whose work never gets its proper recognition.

What is so important about this background radiation? It has since then sparked an enormous amount of research about the early development of matter in the first trillionths of a second of the history of the universe following its presumed start. Physicists are now investigating the first 3 or 4 x 10<sup>-35</sup> seconds. I won't even try to illustrate what 10<sup>-35</sup> seconds is. The significant thing is that, as science goes back step by step into that enormous range of the past, we have to deal with orders of magnitude. It doesn't matter that it is a very short time. We have moved from 10<sup>-3</sup>, 10<sup>-10</sup>, 10<sup>-24</sup> to 10<sup>-35</sup> seconds, and important disputes have arisen about what happened at 10<sup>-43</sup> seconds. But that's another matter.

Anyway, very precise orders of magnitudes have been specified when something exceedingly specific happens in the evolution of subnuclear matter. All those steps are exceedingly well demonstrated in subnuclear physics or subnuclear cosmology. This is exactly the very opposite to that ultimate nebulosity which Laplace had proposed almost 200 years ago and by which scientists and intellectuals were swearing for more than a hundred years. The point is this: modern scientific cosmology as we go back into the very distant past of the universe shows us a universe which is invariably specific. Not only that, the universe is shrinking as we go farther and father back in time. Finally, the universe is so small as to be about one millionth the size of a pinhead. Mathematical physics gives us the most fantastically exact details about that pinhead. It is almost like a diamond in a ring. If we look at that diamond, it is impossible to assume, precisely because it is so specific, that it had no cuts. It had to have a cutter.

The word cutter is most interesting. Let's go back to the Old Testament's *Bereshit bara Elohim*, "in the beginning God created . . ." *Bara* means cut or *slash*. We have diamond cutters and the "universe cutter." The Hebrews did not have a better word than "cut" or "slash" to indicate the utmost ease with which God performed the making of the universe.



When we cut, then result is specific. God's work, too, was specific. He produced a very specific universe. So there is even an etymological parallel between the diamond that is cut and the universe that is cut in the beginning.

These are two main contributions that modern scientific cosmology can make to the metaphysical cosmological argument: the universe is to be taken for a reality and for a very specific reality at that. But modern scientific cosmology is no proof of the creation of the universe. It is not even proof of the universe. Modern scientific cosmology presupposes the universe as a reality. Immanuel Kant had a marvelous though not original insight — in fact Descartes had already stated it — that the three main realities are God, the universe, and the soul. Instead of soul, Descartes used the will. It doesn't matter; it is a minor point. God, the universe, and the soul are metaphysical notions, in spite of what we read in such books as *A Brief History of Time*, which has only one major shortcoming. It's not brief enough. It is an appallingly shoddy work as far as the history and philosophy of science is concerned. It ends with an almost harebrained claim — in a humanistic wrapping.

Thus Stephen Hawking says that scientists should try to produce such a simple explanation of the whole universe that every layman may understand it and discuss it. But then he gives away the game because he urges the layman — he doesn't urge the scientist but he urges the layman — to have recourse to the insights of all the great philosophers of the past and in particular to Aristotle and Kant. Now, we can have the insight of one or the other but not those two taken together. Otherwise one would try to mix fire and water.

The universe — please don't forget this — is a metaphysical notion. And how do we prove its existence? Let me point out one more thing before we adjourn, namely, that the Christian theology teaches two things about the universe: that it was created out of nothing, *ex nihilo*, and it was created in time. "The nothing" is one of the most fundamental Christian notions. If we throw away "the nothing," we are finished off as Christians who can claim any rational self-respect. The notion of "nothing" is one of our most cherished possessions. If we let the nothing — via Bergson or modern quantum creation or other nonsense — slip through our fingers, we have lost everything.

God creates. The Greek demiurge fashions the universe out of something, but our God creates out of nothing. There is no analogy between the two processes. We have either one or the other; the two cannot be bridged by either bad philosophy or by the total misinterpretation of what goes on in modern scientific cosmology, the inflationary theory and so forth.

The other thing which our faith teaches us is that the universe was created in time. There has been a lot of misunderstanding of what is meant here. What I said about space also applies to time. Time is not a container. Insofar as physics is concerned, time exists only inasmuch as it is a measure of motion. Our inner experience of time is another matter.

What Christian theology means by saying that the universe was created in time is that the past history of the universe is strictly finite. Good Christian theologians have never been so inept as to think that there was something, time, before the creation of the universe. This is precisely the point which Augustine faced in connection with a slur on the Christian notion of creation in time. You know that famous story — I think it is either from the *Confessions* or *The City of God* — about Augustine confronting the objection, "what did God make before He had made the universe?" Some half-baked idiots answered, "He was busy preparing hell for those who ask such questions." It is not Augustine who said this. It is the objector who is trying to make fun of the Christian notion of creation. And time and again, we find the statement ascribed to Augustine in modern scientific cosmological literature. Prominent scientists did not care to look up the original text which is easily available in English translation.

The point is this: the history of the universe is finite. Christian revelation doesn't tell us how long a time that is. We come to science. Science is pushing its investigation farther and farther back in the past, 15 billion years, 15 billion plus 1 year, 15 billion plus 1 and 1/10 of a year, and then we come to those increasing orders of magnitude, in which we divide the seconds and the milliseconds and the trillionths of a second, to  $10^{-43}$  seconds.

*The New York Times* has stated at least 50 times during the last 25 years that physics has pushed the frontiers of our observations back to the first moment. That is an absolute stupidity. You see, we cannot observe the first moment simply because, in order to establish it as the first moment, we have to observe the "nothing" prior to it. How can we observe the "nothing"? We can't. In other words, all the talk which earns Stephen Hawking and others millions of dollars in royalties, namely, that they can tell us about the first moment, is worthless. They merely pretend to tell us about that first moment in such a simple way that it disposes of the creator, and they let themselves be described by the eager media as *Masters of the Universe*. See how far we have come from Christian culture.

Only 100 or 200 years ago, let alone 500 years ago, when people talked about the *Master of the Universe*, they meant God. Here, too, Christianity made a great breakthrough. If we look up Book Lambda in Aristotle's *Metaphysics*, what do we find there? We find that the universe is like



a house without a master or like an army without a commander. Christians imposed the cultural consciousness that the universe had a Master. Now these presumptuous people are shown on the covers of great magazines like *Spiegel* and *Newsweek* with the title *Masters of the Universe*.

This is an illustration of what a profoundly non-Christian culture believes. Until recently, only certain relatively superficial aspects of Christianity were under attack — say, marriage, divorce, all that type of thing. But today the scientific ax is put at the "nothing." Who has Mastery of the

universe? This is done in the name of science. It is done in terms apt to turn totally the heads of an entire culture for several generations. Then we wonder how it is that our Christian message doesn't get through?

Don't we realize what we have to contend with? In other words, first we have to unmask and dismantle this wholly pseudo-scientific cultural construct dished out by Nobel Laureates, by members of the Royal Societies, by members of Academies of Sciences before we can even get to the first base, intellectually speaking.

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### NEW MEMBERS

**HEALY**, Mr. John P.; 10032 Fox Den Ct., Ellicott City; Maryland, 21042, U.S.A.; Attorney (retired); Self-employed; (410)-465-5737; FAX (410)-730-7642.

**PRATHER, PhD**, Randall S.; 162 Animal Research Ctr-Univ. Missouri-Col., Columbia; Missouri, 65211, U.S.A.; Associate Professor of Animal Science; University of Missouri-Columbia; (573)-882-6414; FAX (573)-882-6827; E-MAIL pratherr@missouri.edu.

**TAUSSIG**, Victor E.; Arenales 2176 - 5<sup>o</sup> -A, Buenos Aires; 1124, Republic of Argentina; Enterprise Assessor; Family, life, biotechnology; 054-1-1-4823-3595; E-MAIL vet@cotelco.com.ar.

**WILLMERING**, Mr. Robert G.; 2527 El Paulo Ct. - Apt. C, St. Louis; Missouri, 63129, U.S.A.; Masters in Political Science; Semi-retired; ITEST areas of interest; (314)-845-6073.

### CHANGE OF ADDRESS

**CONNOLLY, SM**, Fr. Grahame J.; PO BOX 29066 - Greenwoods Cnr., Auckland; 1030, New Zealand; Catholic priest; Society of Mary; Bioethics; 0064-9-630-3956; FAX 0064-9-623-2441; E-MAIL g.connolly@clear.net.nz.

**LEAVITT**, Mr. Donald G.; Whitehall 6 C 710 - S. Hanley Rd., Clayton; Missouri, 63105, U.S.A.; Patent Lawyer; Science and philosophy; (314)-726-5871; 231-5400; FAX (314)-231-4342.

**SALIWANCIK**, Mrs. Doris; 3902 N.W. 20th Lane, Gainseville; Florida, 32605, U.S.A. (352)-271-9514.

**TRACY, SJ**, Fr. Norbert J.; 100 Bellview Blvd. - Fraternity of Priests, Steubenville; Ohio, 43952-1679, U.S.A.; Administrator: Sogang University; Jesuit Universities Worldwide; Ethics, theology, science; 011-82-2-716-1230 in Seoul, S. Korea.

**VAN HOVE, SJ**, Fr. Brian; Cardinal Muench Seminary; 100 35th Ave., NE, Fargo; North Dakota, 58102, U.S.A.; Priest, Teacher; Cardinal Muench Seminary; (701)-271-1295; FAX (701)-271-1250; E-MAIL vanhoveb@juno.com; cardinal muench.org.

**WOLBERT**, Jerome J.; 1412 Cambridge Road, Ann Arbor; Michigan, 48104-3517, U.S.A.; Prof. of Mathematics; University of Michigan; Mathematics, philosophy of science, linguistics; E-MAIL wolbert@member.ams.org.

### E-MAIL/PHONE CHANGES

<b>HILL</b> , Reverend John	E-MAIL cathpymb@ozemail.com.au
<b>HODGSON</b> , Dr. Peter E.	E-MAIL p.hodgson1@physics.oxford.ac.uk
<b>HUBISZ</b> , Dr. John	E-MAIL hubisz@mindspring.com
<b>KEILHOLZ</b> , Ms Peggy	PHONE (314)-544-1908
<b>O'MALLEY</b> , Dr. Alice T.	PHONE (978)-345-2617
<b>UDIAS, SJ.</b> , Fr. Augustin	E-MAIL figeo12@sis.ucm.es

### IN MEMORIAM

**Mr. J. Paul Ohrman**

We also ask your prayers for ITEST members who are ill. May they feel the restoring hand of the Lord.