

Universidad Popular Autónoma del Estado de Puebla
**"Por Él fueron hechas todas las cosas ; y sin Él no se ha hecho
cosa alguna de cuantas han sido hechas (Jn 1:3)":**
Problemas y promesas teológicas del paradigma evolutivo

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Introduction: The Evolutionary Paradigm

Today I want to exemplify the dialogue between religion and the sciences by discussing a specific theme in biology: the theory of evolution. I hope to initiate a discussion by offering my interpretation of some issues raised for theology by this scientific paradigm. For the past 150 years, metaphors of evolution and of development have begun to permeate virtually all of the sciences, from cosmology and stellar evolution to planetary geology, biology, neuroscience and genetics. This great revolution — the revolutionary change from a young and static cosmos to a very old and very dynamic and changing universe — has compelled religious believers in almost every tradition around the globe to acknowledge that they now inhabit a world profoundly shaped by this exciting new matrix of ideas and assumptions. I would like to sketch what I regard as some of the central theological issues affected by evolutionary thinking, such as theological anthropology, the problems of evil and theodicy, and the doctrines of soteriology and eschatology. Each of these topics is of course enormous, and we could spend an entire academic term in their study. Nevertheless, I think it is important for us to consider them, however briefly, for I regard the engagement between theology and science not as threatening but as potentially very fruitful. To be sure, the problems that evolution raises for systematic theology are different from those raised by a pre-Darwinian static world picture, but they are not necessarily more difficult for us to explore than under an older paradigm.

Creationism vs. Evolution

Of all the great scientific ideas in the past two centuries, the one that stands out most prominently in the minds of most people as being potentially damaging to religion is that of biological evolution. As you know, in the English speaking world, the evolution and creation controversy is often cited as evidence that science and religion have always been in conflict. This so-called “warfare myth” was made popular by A. D. White and J. W. Draper in the 19th Century [outlined in my chapter in *Ciencia y religion hoy*]. But the myth of dramatic warfare is a simplistic reduction of the issues, and the real historical relationship has been far more complex. Religion and science as two human institutions of foundational importance have stood in creative tension for several thousand years. Sometimes they have stood in conflict, or alternatively, they have ignored each other; more usually they have coexisted in relative harmony, and often they have even contributed positively each other’s development.

Scholars in the past three decades have rejected the myth that a state of constant conflict has prevailed between religion and science, and are building a solid foundation of sophisticated historiographical treatment. Recent work includes David Lindberg's and Ronald Numbers' *God and Nature*, John Brooke's *Science and Religion: Some Historical Perspectives*, and John Brooke and Geoffrey Cantor's *Reconstructing Nature: The Engagement of Science and Religion*.¹ An important book has just been written by Father Mariano Artigas, himself a plenary speaker at Encuentro VI in 2002, who with historian William Shea has published *Galileo en Roma. Crónica de 500 días* (Ediciones Encuentro), a book exploring new sources to draw a more sophisticated picture of the Galileo controversy.

We have at present a peculiar situation in the United States (even more bizarre than the re-election of George Bush by the states which do not have many universities). In a scientifically sophisticated and technologically innovative country, we also have a very substantial minority of the population (around 40%) who believe that the earth was created more or less as we see it now sometime in the last ten thousand years. This is a very odd juxtaposition of scientific sophistication with simplistic young-earth creationism. Ironically, the creationists employ sophisticated technological means to present their case for a world-wide flood in the time of Noah. How did this movement arise, you might ask? After all, the initial response to evolution by theologians in England and elsewhere was often very positive, as in the case of Asa Gray, and some of the hostile reaction to Darwin's theory came from scientists opposing it on scientific grounds, such as geologist William Dawson and paleontologist Louis Agassiz).² Ronald Numbers argues in *The Creationists* (1993) that young-earth creationism was by no means an immediate response to Darwin's publication of the *Origin of Species* in 1859. Rather, it was a delayed reaction to a particular interpretation of the theory of evolution, and it sprang from social circumstances in the developing United States. For one thing, as the Western frontier developed, the people who flowed westward to settle what they thought was wilderness (but which was already thickly populated by indigenous peoples) were served by protestant ministers who were often had very poor theological education, and who had quite pressing problems serving new congregations in very rural circumstances. Integrating a scientific theory into Christian theology was not foremost on their list of things to teach their parishioners. But the Creationist movement really was born in the early part of the twentieth century, when American Protestants — whose world had been upset by wars and social tensions and themes in modernism — developed a program of five fundamental points they regarded as essential for Christian belief. These points were based on beliefs that appeared in a series of 12 volumes of scholarly essays written about the Bible between 1910 and 1915. The fundamentals were: (1) Biblical inerrancy, (2) the divinity of Jesus, (3) the virgin birth, (4) a satisfactory theology of the atonement, and (5) an expectation of the imminent Second Coming of

¹ David Lindberg and Ronald Numbers, eds., *God and Nature: Historical Essays on the Encounter between Christianity and Science* (Berkeley: University of California Press, 1984); John H. Brooke, *Science and Religion: Some Historical Perspectives* (Cambridge University Press, 1991); and John Brooke and Geoffrey Cantor, *Reconstructing Nature: The Engagement of Science and Religion* (Edinburgh, T&T Clark, 1998).

² See A. Hunter Dupree, "Christianity and the scientific community in the Age of Darwin," in Lindberg and Numbers, eds., *God and Nature*, 351-368.

Christ. The fundamentals have been enormously influential in American Protestant circles, and it may be no accident that the U.S. President in 2001 referred to the war on terror as a “new crusade,” which not surprisingly was interpreted as very offensive by leaders of Islamic nations.

Creationism is largely a problem of the United States, although it has been exported to Australia and England in recent decades. This afternoon we will not concern ourselves with this phenomenon, but I do want to point out that the debate surrounding evolution and creation in the US usually presents the two as competing and mutually exclusive explanatory frameworks. This is not at all true, of course, and I believe that some of the central points of dispute could be resolved by more carefully outlining the epistemological issues involved, which rarely happens.

A Question of Epistemology

Let me at this point declare my own theistic assumptions. As a Roman Catholic I am committed to belief that the universe is not self-subsistent. In philosophical terms, it is not “necessarily existent,” but rather is contingent upon some other force or power or being to whom Christians refer as “Deus” or “Dios” or “God.” (Our Abrahamic brothers and sisters in monotheism use their own terms, such as “Yahweh” or “Allah”.) This God sustains the universe in existence. I acknowledge the serious philosophical issues surrounding the claim of this divine being’s existence; I am aware that many people question who or what God is or might be, and whether or not such a God is uncreated; I recognize also that the answers to these questions are many and varied. However, I am also convinced through my exposure to religious experience – mine and that of other believers – that God is in some dimly analogous way personal, and expressive of particular intentions with respect to the universe. This of course opens up many intriguing theological and philosophical questions, such as the problem of evil, which I will sketch in a moment.

I am also a creationist. I believe that God is primordially responsible for the creation of all life on earth, although just how God did this is a fascinating question. Not being an astrophysicist, I accept what such experts tell me about the age of the universe being somewhere between 12 and 15 billion years. As a creationist, I believe that life sprang from primitive origins (terrestrial or extraterrestrial) and has evolved over 3.8 billion years to the present time. (I recognize that there are competing “origins” theories ranging from panspermia to oceanic sulfur vents to continental freshwater pools, but I will leave these disputes to the experts). I will accept the scientific consensus about how all this happened, and strive to map this growing scientific consensus onto my religious experience and my theological perspective of a God who creates and sustains and cares for the universe.

Now, you will notice that there is an apparent discrepancy between how I am using the terms “creation” and “creationist,” and how these terms are usually reported by the press or understood in popular parlance. I understand “creation” not as a particular historical event, but rather as a theological claim about the ontological dependence of our world upon a source outside of itself. Thus, creation as a theological claim is entirely compatible with evolution as a scientific theory, and to contrast them as polar opposites is to commit a category mistake.

So why does the problem of interpretation persist? Although as I have indicated there are strong cultural aspects, I believe that the conflict is at root epistemological. American culture has for the past century witnessed a gradual hijacking of the Christian doctrine of creation by a vocal “fundamentalist” contingent that arose in the early decades of the twentieth century and spanned across numerous Protestant denominations. Parallel to this, the theory of evolution — which properly speaking is a biological theory about how organisms develop into different species through the transmission of genetic modifications to offspring — evolution has not infrequently and quite illegitimately become attached to atheism. Let me distinguish between two forms of naturalism. Methodological naturalism is the legitimate exclusion of appeal to divine intervention as an explanatory factor for a natural phenomenon. In the case of earthquakes, for example, we now use the theory of plate tectonics and the shifting of crustal plates on then earth’s mantle to explain how sudden shifts in faults between plates cause earth tremors. In the West, we generally no longer appeal to the anger or the capricious will of the gods or of God to explain these events. However, even if naturalism is legitimate as a scientific methodology, it is often subtly and illegitimately transformed into a metaphysical naturalism, that is, the belief that nothing exists except nature. Clearly, there is no scientific justification for making the claim that since we do not appeal to religion to explain science, therefore God does not exist. This is a philosophical claim or assumption, not a conclusion justifiably reached by the scientific method. Atheists may of course be correct in their denial of the reality of God (although I hope they are not), but evolution as a theoretical framework should no more be attached to the metaphysical rejection of God than to an appeal to God as an explanatory agent, as proponents of the Intelligent Design perspective argue.

For a long time in my life, I was quite non-plussed as to why there was a debate about evolution and creation; I simply didn’t understand what the problem was. As a Christian I believed in the doctrine of creation, that is, the teaching that “creation” as a free act by God giving existence to the universe. But I also had the good fortune to be raised in a theologically literate family, and when I began to recognize (at the age of four or five) that there was a major chronological conflict between the Genesis creation story and the dinosaurs with which – like all children, I was fascinated – I was taught by my parents that the Book of Genesis (and similarly the rest of the Old Testament) is not a scientific treatise but rather the halting, eclectically authored and redacted, incremental record of the Hebrew people’s experience of God. As I grew older, I became a backpacker and mountaineer, and was quite fascinated with the geological and natural history of my surroundings. As I took seriously the exposed rock strata and fossils of Death Valley, or the intricately developed ecosystems of the Olympic Peninsula, it was impossible for me not to appreciate the awe-inspiring trajectory of what geologists and historians of science refer to as “the deep history of time.”

Although one of course does not have to be a religious believer to believe in biological evolution, I would say that it is precisely because of my religious faith that I believe in evolution. If religion is the quest for meaning, purpose and value, then an important part of that quest is holding an appreciation for human reason and for the fruits of scientific rationality. In the Gospel of John, Jesus is reported as saying "If you continue in my word, you are truly my disciples, (8:32) and you will know the truth, and

the truth will make you free." (vs. 8:31-32). I believe that there is a biblical mandate for Christians to open their minds to the world around them. This includes an epistemological openness to the ways in which science operates. I therefore wish to reclaim the term "creationist" from Fundamentalists. The doctrine of creation in Catholic theology as I understand it, has not historically relied upon making particular claims about the literal truth of the first three chapters of the Book of Genesis. Biblical hermeneutics or interpretation has allowed for multiple senses of scripture, and the literal has not always been the most important.

But let me assert that part of the problem is the vocabulary employed by ardent partisans on both sides of the debate. Theologian Howard van Till notes that among antitheistic naturalists one can "find an abundance of reckless assertions that modern science, especially evolutionary biology, has soundly discredited all forms of theism..., and such offensive rhetoric is ...wholly unwarranted and grossly out of place in the public education system."³ Equally offensive rhetoric may be found of the part of Young Earth Creationists and their allies of various stripes, including those in the Intelligent Design camp.

Theology and Evolution: Problems and Promises

Let us now examine some specific theological doctrines and questions. I want to set the stage by suggesting some areas of potentially fruitful engagement. As I mentioned at the beginning, the problems that evolution raises for theology are different than those raised by a static world picture, but are not necessarily either more or less difficult of solution. (Jack Haught argues that evolution is far more coherent for theology than its alternative.)

Questions about the Doctrine of Creation

A first area of Catholic theological doctrine affected by the theory of evolution is that of creation. My title for this talk is taken from the prologue to the Gospel of John: "Por Él fueron hechas todas las cosas; y sin Él no se ha hecho cosa alguna de cuantas han sido hechas." (John 1:3). Nothing was made that was not made by the Logos, the Word of God, the second person of the Holy Trinity. This passage from John complements the first chapter of Genesis, in which six times God affirms the fundamental goodness of each element of creation.

The problems posed for us by the formation of the universe and its evolution over 13.8 billion years might be described as problems of the direction and purpose of creation. Our galaxy contains by some estimates 100 billion stars. By extrapolation from the deep field photographs taken by the Hubble telescope, some astronomers estimate that there are 100 billion galaxies. If ours is an average-sized galaxy, we might reasonably conclude that there are 10^{22} stars. From the scientific perspective, the universe is enormous, and the possibilities of life evolving elsewhere are also huge. For the theologian, the challenge is to confront the idea that there would appear to be no necessary progression to the evolution of the universe. Any number of contingencies might have prevented life from developing on Earth: too close a proximity of the sun to a

³ *First Things*, 34 (June/July 1993): 32-41.

black hole; the gamma ray burst from a randomly exploding supernova; a deadly encounter with a comet or major asteroid.

But life did evolve, and many thinkers are now looking into what Robert Russell and others call the “Anthropic Principle” — “the so-called “fine-tuning” of the universe: in order for life to evolve in the universe, the values of the constants of nature, such as Planck’s constant h and the speed of light, c , must be what we actually find them to be within a factor of one part per million or less!”

[<http://www.counterbalance.org/physics.html>] If a dozen or so constants were not what they actually are, life would not have evolved. Nancey Murphy and George Ellis have even argued in *The Moral Nature of the Universe* that the cosmos is fine-tuned not only for evolving life, but for evolving morally responsible and spiritually responsive life.⁴

Belief in the nature of the universe as having been designed therefore seems to derive some plausibility from discoveries in cosmic evolution. But what about more specific theological beliefs about the central role of humanity, and the salvific death of the man Jesus Christ? Must we believe that our world had to develop as it did, that life had to take the various convoluted turnings it did, with dinosaurs reigning for 180 million years until their extinction, fortuitous to the mammals? Do we have to believe that mammalian evolution mechanically followed a series of steps to the evolution of primates, of great apes, of pre-human hominids, and finally of *Homo sapiens*? Stephen Jay Gould argued in 1991 that if we “rewound the tape of events to play evolution out once more, the odds are against anything like *Homo sapiens* developing.” [*Wonderful Life*, 1991] In contrast, Simon Conway Morris argued in *The Crucible of Creation* (Oxford 1998) that evolution is directed, and that it only happened once. His is not a theological argument, but the dispute with Gould illustrates the importance of science for Christian theology.

The facts are that life has evolved as it did, and that we find ourselves here, even if only temporarily in the sense of geological time. And the experience of humanity includes the, experience of God acting within history, specifically for Christians in the person of Jesus. It seems to me that the claim in John’s gospel that “Nothing was made that was not made by him” contains a profound truth from our perspective. And the truth of this verse is complemented by verses four and five: “In him was life; and the life was the light of men. And the light shined in darkness; and the darkness comprehended it not.” Although the whole of human history is but the smallest fraction of geological and cosmic time, our history comprehends the only time and the only place of which we know in the universe, in which creatures have evolved from subatomic particles who can say through Saint John the Evangelist, “And the Word was made flesh, and dwelt among us, (and we beheld his glory, the glory as of the only begotten of the Father,) full of grace and truth.” And this, surely, is not insignificant.

Questions in Theological Anthropology

In Western thinking, springing as it does from the classical and Judeo-Christian tradition, the human person has usually been regarded as uniquely valuable. Each of us is an individual creation by God, a personal creation of intrinsic value. But how this

⁴ Nancey Murphy and George Ellis, *The Moral Nature of the Universe: Theology, Cosmology, and Ethics* (Minneapolis: Augsburg / Fortress Press, 1996).

personhood has been described and evaluated has a long and complex history. Some thinkers have emphasized a sort of dualism in the Platonic tradition. Others have emphasized an Aristotelian union of soul and body, mind and matter, with the soul serving as the essential form of the body. Under Cartesian influence in the seventeenth century, dualism again reared its head, and the problem has remained with us since.

However, there are voices arguing again for the reaffirmation of a more coherent psychosomatic unity, a Hebraic understanding of the person, and this carries its own challenges. If we accept a purely evolutionary account of the human being as psychosomatic unity, this means acceptance of the evolution of the mind or the spiritual aspect of the person, a position not accepted by Pope Pius XII in *Humani Generis*:

The Teaching Authority of the Church does not forbid that, in conformity with the present state of human sciences and sacred theology, research and discussions, on the part of men experienced in both fields, take place with regard to the doctrine of evolution, in so far as it inquires into the origin of the human body as coming from pre-existent and living matter. But, Catholic faith obliges us to hold that souls are immediately created by God. (*Humani Generis*, 1950, para. 36)

I would argue that Catholic theology can indeed accept the evolution of the soul, rather than some arbitrary creation of it by God, and insertion of it into some hominid we call “Adam.” Though I like much of what Chilean biologist Rafael Vicuña says in his contribution to UPAEP’s *Ciencia y religion hoy*, I am very uneasy about his suggestion,

Nos inclinamos por la idea que el alma intelectual fue infundida en un instante más bien reciente del proceso evolutivo, hace al menos unos 70.000 años... a una especie de homínido que y estaba preparada para recibirla, completándose así el peculiar camino dispuesto por dios para la creación del hombre.⁵

I am uneasy about this suggestion because it implies a sudden and supernatural break in the natural history of evolution. It is not impossible, of course, but it places the evolution of the human soul outside the bounds of science.

Insisting upon the integrity of science to do its job in this respect will require us to rethink radically our theological anthropology. What is a human person? What is a soul, or the spiritual dimension of the person? In *Whatever Happened to the Soul* (1998) Warren Brown and Nancey Murphy question whether the soul as presented in traditional scholastic theology even exists. What is it, and what is its connection to the body that has evolved from primordial matter? Why should we (e.g., Pope Pius XII) exclude the “soul” from scientific investigation, drawing a protective belt around it? Could there not be a sense in which the soul or the “souliness” is a property of emergent rationality. Philosophical theologians such as Nancey Murphy and Philip Clayton have argued for a non-reductive physicalist account of the person, according to which mind or soul is an emergent property not reducible to biological, chemical, or physical properties. On such an account, physical nature is seen as transmitted by God through the evolutionary process, and the soul integrally with it. Such a view is consistent with the Hebraic psychosomatic view, or the view of the person as an embodied soul, or an

⁵ Rafael Vicuña, “El origen de la vida y la emergencia del alma humana,” in *Ciencia y religión hoy: diálogos en torno a la naturaleza*, ed. Eugenio Urrutia Albúsa y Juan José Blázquez Ortega (Puebla, México: UPAEP, 2003), 206.

“ensouled body.” And curiously, a similar view was propounded by the third century Latin theologian Tertullian, who argued the “traducianist” view, namely, that the soul is transmitted from parents to children through the sex act.

Two Issues of Human Uniqueness

First, how is human life to be regarded in relation to other animal life on this planet? If we accept that *Homo sapiens* has an evolutionary history of several million years, and that we are in fact genetically related very closely to the higher primates, and less closely to all terrestrial life, how do we distinguish between ourselves and the rest of life? And what is the relevance of this question for theology?

It seems to me quite relevant. If we hold a theology of salvation, a soteriology, and if in this soteriology there is reserved a special place for humans, it would be relevant to know at what point in our evolutionary history the pre-human developed into the fully human. At what theologically or ethically relevant point did primates develop sufficient brain power to become responsible for their own actions, to develop an ethical and spiritual awareness? Furthermore, what is it that distinguishes us from non-human animals? Is it cognitive ability? Our DNA? What is the ontological difference between a severely cognitively impaired human and a very intelligent primate? I do not have answers to these important questions, but it is essential for theology to consider them.

Second, there is the issue of extraterrestrial life. I suggest that the discussion must take place in a context of a wide understanding of the divine purpose for the universe. If God established the parameters of a dynamic universe before the Big Bang — assuming, of course, the cogency of Big Bang cosmology — it seems that the evolution of organic compounds and of planets capable of supporting life around second generation stars was built into the universe. Indeed, Nancey Murphy and George Ellis have argued in *The Moral Nature of the Universe* that the cosmos seems designed not only to support life, but to support the evolution of complex, intelligent, morally responsible life.

Our galaxy contains something on the order of a hundred billion galaxies. Some have estimated (based on the Hubble Telescope’s “Deep Field” image) that there may be 100 billion galaxies in the known universe. If organic compounds can indeed be somehow sparked into life, since it has happened in our solar system it would seem likely to happen elsewhere as well. Christiaan Huygens (1629-1695) said three centuries ago, “Or can they force themselves to think that the wise Creator has disposed of all his animals and plants here, has furnished and adorned this spot only, and has left all those worlds bare and destitute of inhabitants, who might adore and worship Him; or that all those prodigious bodies were made only to twinkle to and be studied by some few perhaps of us poor fellows?” (Christiaan Huygens, born on April 14, 1629, d. 1695, discovered Saturn’s largest moon, Titan, in 1655; discovered the true shape of Saturn’s rings)⁶

The theological issue of the status of life throughout the universe, both terrestrial and extraterrestrial, leads us to question how divine purpose is to be interpreted or

⁶ On this point, see Steven J. Dick, *The Extraterrestrial Life debate from Democritus to Kant*.

understood. Is the significance of humanity, and of God's self revelation through the religions of earth (to say nothing of the more specific claims to revelation through Jesus or Mohammed) – substantially relativized? Some seventeenth-century theologians rejected the idea of extraterrestrial life on the grounds that it would necessitate multiple crucifixions of Christ in his multiple incarnations on other planets.⁷ Or could we argue that God reveals Godself as fully as necessary on Earth, and that if we ever encounter other rational species through our exploration of space, we will face the problems at that time?

Theodicy and the Problem of Evil

The issue of excessive waste and suffering in the evolutionary process. Theologians in the Abrahamic traditions must confront the question of why God should have created a system of natural selection that relies upon the untimely death of most of its creatures, and the ultimately the destruction of all of its creatures. Why so much suffering? Why is evolution so apparently profligate, permitting such a disproportionately huge ratio of lives cut short to lives that achieve maturity? Why is evolution so destructive of life?

Contemporary Monotheistic Theodicies:

- **Theodicy of suffering as recompense for sin:** many religious and theological traditions have believed that natural evil and suffering are a direct result of human sin (Christian, Islamic, Hindu Karmic theodicy). As recently as last week, I read on CNN that some Muslims in southern Sumatra were blaming the tsunami deaths of Muslims in the north on their lack of faith in Allah! But is this a satisfactory theodicy? No, for two reasons. First, there is no accurate correlation between sin and natural disaster. In 1994, we had an earthquake in Northridge, California. If God was intending to punish Hollywood for the immorality of the sex and violence of its films, and hit Northridge instead (160 km from Hollywood), either he is ignorant of California geography, or he is a bad shot! But second, it is not clear that in a Christian sense we even have a right to expect that the just should prosper while the wicked are punished. Jesus said that “it rains on the just and the unjust alike”(Matthew 5:45). If the opposite were true, God would be micro-managing the universe. Charles Darwin suffered tremendously at the agonizing death of his beloved daughter Annie and wondered why anyone would even wish the Christianity he had been taught to be true. His loss of faith was due to the experience of suffering, not to his theory of evolution.
- **Theodicy of soul-making.** American philosopher of religion John Hick argues that perhaps God permits suffering because it builds human character. And in part he is quite correct: a world without suffering would not afford us with opportunities for developing heroism, compassion, sacrifice, and altruistic love. But the fundamental problem is that the sheer mass of suffering — both of us

⁷ J Dillenberger, *Protestant Thought and Natural Science* (University of Notre Dame Press, 1988), 21-22.

human beings and of the trillions of animals throughout evolutionary history — seems entirely out of proportion with soul-making. Can the moral evil of the Nazi Holocaust be explained on the grounds that it developed compassion in its survivors and its witnesses? Were the deaths of six million Jews really necessary? This theodicy also does not account for animal suffering the history of competition, predation, and the struggle for life. For every 100 salmon eggs, perhaps one hatches and survives one season. Let's assume that only one in ten salmon reaches the ocean, and that one in ten of those survives the 2-3 year oceanic period of its life, and one in ten survive the trip back upstream to spawn a next generation of salmon. The survival rate is 1 in 100,000. From the perspective of all the creatures that eat the salmon this is a gift from God. From the perspective of the salmon what are eaten, it is not good, even if it strengthens the species as a whole. Is the natural evil of 3.8 billion years of animals killing and eating other animals justifiable by the ultimate evolution of humans?

- **Submission to divine sovereignty** – this is the theodicy of the book of Job. Perhaps this theodicy is emotionally satisfying in the face of the enormity of evil and suffering, but it is not intellectually so, because it does not offer any real answer; it merely encourages us to submit to the mystery of the divine plan.
- **Process theodicy** – John Cobb of the Claremont Graduate School. An intriguing proposal with some promise to it. Cobb and other process thinkers argue that God is evolving along with the world, and therefore cannot foresee the evil and suffering involved in the evolutionary process. But this approach sacrifices the traditional divine attributes of omnipotence and omniscience, and is therefore not satisfactory to most Christian theologians.
- John Haught suggests yet another approach, a **theodicy of kenosis**, in his recent book *God after Darwin: a Theology of Evolution*. He suggests that “an evolving universe may aim toward perfection, but at any moment prior to such an unimaginable fulfillment it would have to be not-yet-perfect. And if it is not perfect, then...imperfection, including the fact of pain, will be part of it.”⁸ Haught's theodicy is therefore a theodicy of divine humility and restraint. “Along with the thrill of living comes suffering and eventual perishing.” (55) There are aspects of this theodicy that I like, but ultimately it seems to be dissolved in the mystery of creation, like that of Job.
- PMJHess – my own attempt at formulating a theodicy borrows much from the thought of others. Like Haught, I believe that ultimately all theodicies fail. Nevertheless, I propose a **theodicy of an open creation**: It could be that the only universe that God could have created consistent with the evolution of self-aware creatures is a dynamic universe, complete with asteroid collisions, plate tectonics and their volcanoes and earthquakes, a dynamic atmosphere with tornados, ice ages, viruses and the other factors relevant to extinction and speciation. God

⁸ John F. Haught, *God after Darwin: a Theology of Evolution*. (Boulder: Westview Press, 2000), 54.

might have been constrained (as Stephen Hawking suggests in his *Brief History of Time*) by a limited number of options for equations to create our universe. If God willed the eventual evolution — on this planet, and I firmly believe on other worlds — of morally sensitive and religiously responsive creatures, it might be that only a dynamic and violent cosmos could nurture life. All theodicies fail, and the answer to the problem of pain and suffering will not be the same for all traditions or at all times. Nevertheless, it is a key issue both for interdisciplinary dialogue and inter-religious conversation.

Issues of Ultimate Meaning and Cosmic Purpose

What is the purpose of the universe? What will happen to life in the end? When is the end in a non-static universe? Is it the incineration of the Earth in five billion years? The Death of the Milky Way Galaxy by its black hole? The entropic heat death of the universe? If gravitation eventually slows down and stops the expansion of the universe, and the expansion reverses through a big crunch, where the kingdom?

Soteriology

Human religious traditions have always had to deal with the human feeling that all is not right with the world, that sin and death and finitude have to be overcome. Christian theology as developed in a static geocentric cosmos posited the saving death and resurrection of Jesus Christ as constituting the definitive act of salvation. But in light of contemporary astrophysics and developmental biology, theological problems abound:

- From what are we being saved? From our basic biology which springs from evolving strategies for survival in an ecosystem of limited resources on a finite planet? Or only from our sinful humanity? Was there a Fall from grace as portrayed in Genesis 3? How might we reinterpret this theologically in light of evolutionary biology?
- To what are we being saved? To continued life as human animals? To eternal existence that transcends our biology? If the billions of years of life destroying life through competition are to end, where is the continuity with life as we know it? Can the vision of Isaiah of the lion lying down with the lamb make any biological or ecological sense? And yet if salvation from sin involves a cessation of our predatory instincts, how is our essential humanity saved? Does soteriology involve an essential change in human nature?
- Is “sin” inevitable? Is the human experience of sin an inevitable outgrowth of competition for survival, transposed onto a rational plane? **Sociobiology:** CTNS is currently launching a research project to examine the Sociobiological explanation for human behavior. Is sin in our genes? Are we responsible for anything? Is genocide the most logical implication of sociobiology, if proliferation of our own selfish genes is the objective? But altruism seems to be built in, and E. O. Wilson hasn’t found the answer to it.

- Are all and only human beings “saved”? If not, then why not the world? (For us and the world’s salvation). The Medieval theological drama saw the world merely as a stage on which was played out the human drama of salvation. What about emergent rationality in other species, or about superior rationality in extraterrestrial species? Does this entitle them to salvation? Is the vision of Origen that all including the devil will be saved a vision that we can adapt to an evolutionary paradigm? Paul speaks in the *Epistle to the Romans* of “All creation groaning in labor pains” as it awaits consummation of the new creation. (Romans 8:26) Does this include all individuals that have ever lived?

Theologies of salvation will need to be carefully rethought if they are to continue to be compelling.

Eschatology: Homo Sapiens and the Far Future of the Universe

Let us turn now to theological teaching on eschatology, a word derived from the Greek *ta eschata*, meaning “the last things.” The teaching of Jesus about the kingdom of God is of course central to Christian thinking about the future, and is in a real sense interiorized. Jesus’ parables of the kingdom often stress an inner, psychological sense of the kingdom. And yet we humans live in our physical bodies, in a physical universe. When we think about the eschatological future, it is quite natural that we should envision it as being related to this life as we know and experience it. En el *Padre nuestro* rogamus “venga a nosotros tu reino...” But where is the kingdom? What is our future? How do we envision eschatology — traditionally conceived on a very short time frame — in light of what we know to be the probable future of the universe? 340 million years from now — who or what will live upon earth? Three billion years from now, when huge molten glaciers of silicon pour into bubbling hot seas of molten iron, when all gases have been stripped from around the earth by solar winds; when all elements of the biosphere have disappeared millions of years before — where then will the kingdom be?

Theology finds itself in a curious position. On the one hand, our eschatological future must necessarily be conceived of as unimaginably different from the finite lives we know in a finite cosmos. God’s infinite creative power infinitely outstrips our insignificant capability of imagining the future. And yet on the other hand, we have to believe that our eschatological future will somehow be recognizable. If it is not recognizable, what would be its connection to this world? What would be the connection between our present moral lives and the eschatological consequences for our actions on earth? We must imagine our future as in some essential way preserving what is distinctly personal about us as individuals. Does this mean that God will recreate us as *Homo sapiens*? Does it mean that God will preserve us as creatures who replicate our genetic information by means of DNA? Does it mean that God must preserve us as carbon-based organic beings?

CONCLUSIONS

Let me draw from this survey some conclusions about the relationship between theology and the biological sciences, and about a more refined understanding of creation and evolution as concepts with different sets of connotations in different disciplinary contexts. The issues in the creation/evolution controversy seem to be divided into three general categories.

A. Problems proper to biology: There are problems and questions of at least two general sorts that fall within the jurisdiction of the biological sciences. (1) First, there are the specific mechanisms by which evolution works, including mutations, genetic transmission of mutation, and competitive and cooperative strategies for securing a survival advantage. I do not see that theology has any claim to offer input on these matters which are internal to the biological sciences. (2) The relationships between biology, paleontology, and geology, including the deep history of time, and species differentiation through continental drift and other geological upheaval. Evolution as a theory is relevant not merely to biology, but a number of other sciences. It is outside the scope of theology as a discipline to comment on these.

B. Problems proper to Theology: Second, there are issues and questions uniquely relevant to theology. These include (1) questions of meaning, purpose and value of life, human and otherwise; (2) the problem of evil and the range of theodicies developed to articulate and justify belief in the loving purposes of God in the face of so much pain and suffering; (3) the question of the nature of the person in light of evolutionary history, including dualist, monist, and non-reductive physicalist theories; and (4) salvation and the purpose of creation.

C. Issues at the interface of biology and theology — such as the nature of the person (human, non-human, and prehuman), the evolution and moral significance of consciousness, and morality and altruism — touch upon both disciplinary areas. This is where some of the most fruitful interdisciplinary collaboration is taking place, as in Marty Hewlett and Ted Peters' forthcoming monograph on the subject.

In a multicultural world, I think it is very important that the differences between these questions be recognized, and that public discussion be conducted on this subject. I am in favor of raising intriguing metaphysical and theological issues with young people, in appropriate contexts such as philosophy or metaphysics courses. But biology classes are not the appropriate loci in which to raise them, and should be restricted to the subject matter of biological research into the nature and development of life, as practiced according to valid scientific methods defined by consensus among competent practitioners and leaders of the profession.

In conclusion, our task as theologians in the world of science and as believing scientists, is to work according to the requirements and integrity of our disciplines, bearing in mind that if faith we “were born, not of blood, nor of the will of the flesh, nor of the will of man, but of God. And that we believe that “the Word was made flesh, and dwelt among us, (and we beheld his glory, the glory as of the only begotten of the Father) full of grace and truth.” (John 1:14)