



*Institute For Theological Encounter
With Science and Technology
“Where Faith & Science Meet”*

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Food, Glorious Food

Unlike Europeans, Americans have a food obsession. America’s popular weekly television program, *Biggest Loser*, commands a large viewing audience in close competition with another obsession, *American Idol*. *Biggest Loser* accepts very obese people who achieve “salvation” through an unlikely program of public humiliation and physical discipline lasting six weeks. The goal is to lose the weight that has eroded the quality of life. Their misuse and abuse of food have generated a “life hardly worth living.”

This is the negative side. Let us take a look at the life-giving use of food

In his wonderfully engaging book, *Eating Your Way Through Luke’s Gospel*¹, the author points out how effectively Jesus himself often used food during both convivial and less than convivial dinner events as occasions for teaching the message of the gospel. A quick check of Google reveals hundreds of references for “food in the bible.” Even without consulting any references, we can immediately recall Old and New Testament instances where food functions as a vital part of the story in Jesus’ message.

Is there a hidden meaning behind Jesus’ apparent affinity for food as a tool of his ministry? Is there a solution here for our biggest losers? What is our role in the whole Christian drama?

These and other questions served as “food for thought” as the ITEST Board of Directors chose the topic of food (genetically modified and organically grown), *Food, Glorious Food*, for our yearly symposium slated for September 25. How do we offer an integrated approach to food growth, production/distribution and consumption while at the same maintaining the distinction between genetically modified food and organically grown food?

This is where the theology/faith component enters the discussion. How does moderation in the consumption of food act as a witness to our love and care for God’s creation? What is the role of the church – that’s us – in this whole venture? Father Brungs, SJ, our late director, reflected on this second question in his essay “One Approach to Genetics and Christian Stewardship,” prepared for the October, 2000 ITEST workshop on *Genetics and Nutrition*.

“The Church has to learn how to address the questions that will arise in growing food and the results upon the crops, the growers and the eaters.” He commented further on the topic: “Farming is a serious way of making a living, of living one’s life, of being present to one’s friends, the family and the land. I don’t see it as a question of biotechnology versus the world, nor of organic farming versus the world. I see each of them as filling a niche and carrying out what they are meant to do. Will the genetically modified wheat be used for the Eucharistic bread? Almost certainly! Then the Eucharistic bread truly would be ‘which earth has given and human hands have made.’”

Perhaps we need to ponder seriously the implications and ramifications food has for us as individuals in a Christian community and the way we witness to our commitment and love of Christ and neighbor in this world. By this witness we are transformed from the biggest losers to the biggest winners.

Marianne Postiglione, RSM
Associate Director: ITEST

1. *Eating Your Way Through Luke’s Gospel*, Robert J. Karris, O.F.M., Liturgical Press, Collegeville, Minnesota, 2006.

In This Issue...

Announcements.....	2
Environmental Stewardship in the Judeo-Christian Tradition: Biblical Foundations and Historical Development by <i>E. Calvin Beisner</i>	3
Prescient Thoughts From The Past	13
Letter To The Editor: <i>Response to Paul Driessen’s essay, DDT: A Weapon of Mass Survival</i> , by <i>Evelyn P. Tucker</i> ,.....	16

Announcements

1. New Directions At ITEST - Webinar Designed For College Students

Under the capable leadership of Dr. Sebastian Mahfood, Secretary of the ITEST Board of Directors, college students are invited to participate in ITEST's first undergraduate webinar scheduled for fall 2010. The extended webinar will be accessible at www.faithscience.ning.com for a two-week period of student theological reflections (October 1 - October 15, 2010) prior to an interactive, synchronous discussion through *WebEx* on the topic of spiritual formation in cyberspace as online interactivity becomes the lifestyle of traditional and non-traditional college students (October 15, 2010). This will be followed by a one-week period for ongoing reflection.

The asynchronous period will draw students into dialogue with one another and with the ITEST membership of scientists and theologians on three conversation tracks on the topics of 1) evolution, 2) our relationship with God, and 3) human life and sexuality.

Church documents, science fiction films, short stories, scholarly treatises, YouTube videos, and newspaper headlines will provide resources for discussion, but the participants themselves will be given the opportunity to serve as the "content" during our time together.

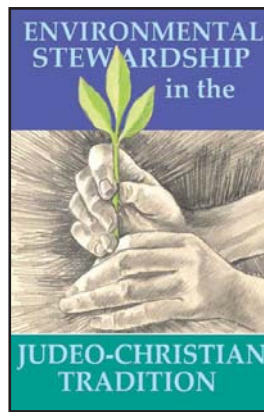
The audio of the synchronous presentation will be preserved on the webinar site, and students will be able to continue responding to the archived materials beyond the end of the webinar if they choose. All registrants will be given free 1-year memberships to ITEST.

2. CTTT Held in Fall River, Massachusetts

Sister Marianne Postiglione, RSM conducted a Creative Teacher Think Tank (CTTT) on March 18 for 70 teachers from K-8th grade representing six schools in the diocese of Fall River, MA. The host school, Saints Peter and Paul, welcomed teachers and principals who mined their creative imaginations producing interfacing lessons not only in faith/science but in other subjects as well. The second tier of our pilot project, *Exploring the World, Discovering God*, focuses on faith/science lessons for grades 5-8; whereas the first tier concentrated on K-4. More than 200 lessons (Christian and Catholic versions) now reside free of charge and are available to all on our web site, www.creationlens.org. Largely funded by grants from the Our Sunday Visitor Institute 2005-2008 and again in 2009, the project has proven successful with actual recorded downloads numbering 124,000.

3. The edited proceedings of the October, 2009 conference,

Environmental Stewardship in the Judeo-Christian Tradition, are being readied for the printer. All dues-paid members through 2010 will receive a bound copy of these proceedings which include the speakers' essays and the tightly edited discussions which follow. We project a summer date for distribution of the volumes on a topic that is not only timely but highly controversial



In Memoriam

Rev. Joseph Daniel Cassidy, OP

Professor of Genetics, Providence College, Providence, Rhode Island

Rev. Francis L. Pedrotti, SJ

Emeritus Professor of Physics, Marquette University

Co-author with his brother Lino of a college physics textbook, *Optics and Vision*, which was translated into several languages. Resided at Jesuit Hall, St Louis, Missouri (1999-2010)

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



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Environmental Stewardship in the Judeo-Christian Tradition: Biblical Foundations and Historical Development

by E. Calvin Beisner

National Spokesman Cornwall Alliance for the Stewardship of Creation

*A paper delivered at the Institute for Theological Encounter with Science and Technology
Annual Conference, October 23–25, 2009*

The dominion mandate to Adam and Eve at the creation makes human responsibility for creation stewardship inescapable. Neither our fall into sin nor the redeeming work of Christ eliminates that responsibility. Rather, the fall complicates it, as the Earth too suffers the consequences of human sin. But redemption elevates environmental stewardship, making it part of the hope-filled task of the redeemed in spreading the kingdom of Christ.

The creation teaches us to praise God. And it shows us God's wisdom and power in establishing complex, inter-connected, and resilient systems sheltering humanity and other creatures. Yet those systems and creatures are vulnerable to harm when humans abuse their dominion. With time, study, and experience, the Church has grown in its understanding of these truths.

It is encouraging to see many U.S. Christians embracing creation care. But we must undertake that task with discernment. Unfortunately, many contemporary church statements on the environment fail that test. It is important to understand, for example, the "environmental transition" by which rising wealth enables societies to solve environmental problems. This historical lesson—that economic growth, lifting the poor out of their poverty, is in the long run beneficial and not harmful to the environment—should offer us guidance and confidence as we address current environmental problems. Among other things, it points to the fact that economic development is the most important step toward improved environmental stewardship.

E. Calvin Beisner, Ph.D.

E. Calvin Beisner, Ph.D., is national spokesman for the Cornwall Alliance for the Stewardship of Creation, a coalition of theologians, pastors, scientists, and economists, and lay leaders committed to bringing Biblical world view, theology and ethics—together with outstanding science and economics—to address simultaneously the challenges of environmental stewardship and economic development for the very poor. Author of over ten books, among them, *Environmental Stewardship in the Judeo-Christian Tradition*, and a frequent guest on talk shows, Beisner has served as associate professor of historical theology and social ethics at Knox Theological Seminary, Fort Lauderdale, Florida and associate professor of interdisciplinary studies at Covenant College, Lookout Mountain, Georgia. Further, he has testified before Congress on environmental issues and has addressed the Pontifical Institute on Justice and Peace at the Vatican.

Neither the environmental transition nor the credibility of many claims of environmental degradation, however, is the focus of this paper. Instead, this paper focuses on the Biblical foundations for environmental stewardship and how some important Christian thinkers and churches past and present have built on them.

Biblical Foundations

Psalm 148: Creation Praises God

There is a kind of praise, the worship that is "in spirit and in truth," as Jesus described it, that can be rendered only by rational creatures—men and angels. But there is also a kind of praise, simply by being what God designed them to be, that non-rational creatures can render and indeed always do. So a psalmist felt no awkwardness in calling on them to praise God:

Praise the LORD! . . .

Praise Him, sun and moon;

Praise Him, all stars of light!

Praise Him, highest heavens,

And the waters that are above the heavens! . . .

Praise the LORD from the Earth,

Sea monsters and all deeps;

Fire and hail, snow and clouds;

Stormy wind, fulfilling His word;

Mountains and all hills;

Fruit trees and all cedars;

Beasts and all cattle;

Creeping things and winged fowl. [Psalm 148:1, 3-4, 7-10]¹

Psalm 19 and Job 38-41: Creation Reveals God

"The heavens are telling of the glory of God; and their expanse is declaring the work of His hands. Day to day pours forth speech, and night to night reveals knowledge" (Psalm 19:1-2). Just what, though, does creation reveal about the Creator? His greatness, His glory, surely. But greatness and glory in what? The simplest, briefest summary comes in Romans 1:20: "His invisible attributes, His eternal power and divine nature."

The Book of Job contains a dramatic illustration of how God evokes human praise through creation. After he had harangued God because of what he considered his own unjust suffering,

Continues on page 4

Job suffered the onslaught of God's challenges to him. God ironically demanded that Job explain to Him various aspects of creation—a task Job found impossible (Job 38:2-11). When God finished His long rebuke, spanning chapters 38-41, Job replied:

I know that You can do all things,
And that no purpose of Yours can be thwarted.
“Who is this that hides counsel without knowledge?”
Therefore I have declared that which I did not understand,
Things too wonderful for me, which I did not know.
“Hear, now, and I will speak;
I will ask You, and You instruct me.”
I have heard of You by the hearing of the ear;
But now my eye sees You;
Therefore I retract,
And I repent in dust and ashes. [Job 42:2-6]

As we think about creation stewardship, then, the first thing we must keep in mind is the doctrine of God—particularly, that an infinitely wise, infinitely powerful Creator made and sustains the universe and every part of it. This doctrine does not mean we have no responsibility for stewarding the creation. But it does mean that the design of all things reflects the wisdom of God, and the sustaining of all things reflects the power of God. These truths are relevant to creation stewardship.

Genesis 1 and Psalm 24: Humanity the Crown of Creation

In Genesis 1 God repeatedly declared “good” each new day's creations. But the crown of creation was humanity. It was not till after He had made humanity that He looked at all that He had made and declared it “very good.” Created things derive their worth not from their usefulness to humans but from God's sovereign evaluation of them. Nevertheless, their intrinsic worth does not make them immune to use by other creatures. After making man and woman, God said to them, “Behold, I have given you every plant yielding seed that is on the surface of all the earth, and every tree which has fruit yielding seed; it shall be food for you; and to every beast of the earth and to every bird of the sky and to every thing that moves on the earth which has life, I have given every green plant for food.”²

Neither does the intrinsic worth of created things make them immune to human rule. God made human beings in the image of God and granted them dominion “over the fish of the sea and over the birds of the sky and over the cattle and over all the Earth, and over every creeping thing that creeps on the earth.” This “cultural mandate” in Genesis 1 bids humans, “Be fruitful and multiply, and fill the Earth, and subdue it.”

The crown of humanity is Jesus Christ, whom the letter to the Hebrews describes as the “heir of all things, through whom also [God] made the world[.]. . . the radiance of His glory and the exact representation of His nature,” who “upholds all things

by the word of His power.” Because of man's fall into sin, “we do not yet see all things subjected to him. But we do see Him who was made for a little while lower than the angels, namely, Jesus, because of the suffering of death crowned with glory and honor, so that by the grace of God He might taste death for everyone.”³

What does it mean for human beings to be the image of God? The Genesis 1 passage presents four principal aspects of this image: wisdom, righteousness, creativity, and dominion. The creation narrative indicates all of these: God *creates* and *orders* the heavens and the Earth by His *authoritative word* and passes moral judgment on all His works. These four characteristics of the image of God ought all to be employed in fulfilling the vocation God gave us: to rule over the Earth.⁴

Psalm 24:1 declares, “The earth is the LORD's, and all it contains.” Another psalm teaches that God has entrusted the Earth to human stewardship: “The heavens are the heavens of the LORD, but the earth He has given to the sons of men” (Psalm 115:16).

In this dominion people are accountable to God. We must reflect God's own creative work and dominion, conducting ours in cooperative fellowship as the Father, Son, and Spirit all were involved in the work of creation. Humankind is called to beget life after our own image and multiply to fill the Earth, subduing it and ruling over all the creatures in it. We are to cultivate and guard the garden and eventually turn all the Earth into garden.⁵

Genesis 3 and Romans 8:

Human Rebellion and Redemption Affect All of Creation

Rather than acting as a responsible steward, mankind rebelled against God. Every aspect of the image of God suffered. What had been a sound mind full of the light of truth, full of the God who is the Truth, became unsound and darkened by falsehood, futile, dark, and ignorant. What had been a clear conscience, untainted by sin, became fouled with the stench of guilt and fear. The once living soul died, becoming mere dust again. He who had been alive in righteousness and holiness became “dead in . . . trespasses and sins.” The companion and servant of God became the companion and servant of Satan. The child of God became a child of wrath. His once fertile and creative brilliance collapsed into “unfruitful deeds of darkness.” Sin brought God's judgment not only on human beings but also on the whole Earth. The Apostle Paul writes of how “the whole creation groans and suffers the pains of childbirth together until now,” as with humankind it awaits God's redemption.⁶

1 Corinthians 15 and Revelation 21: Resurrection and New Creation

But God had from eternity past a plan for redemption through Christ Jesus, the “last Adam.” In Christ's life, He exercised a

Continues on page 5

wise, righteous, and life-giving dominion over the Earth itself (calming a storm), over plant and animal life, and even over human life (healing the sick and raising the dead). By His death and resurrection He saved us from God's wrath, reconciled us to God, gave us the gift of righteousness, and restored us to life. Now those who are His are being restored in knowledge, righteousness, and holiness.⁷

The effects of the atoning death, victorious resurrection, and triumphant ascension of Christ, then, sweep over all of creation. They include people, animals, plants, and even the ground itself. They include the restoration of the image of God in the redeemed and the restoration of knowledge, holiness, and creativity in working out the cultural mandate. This new impetus for the cultural mandate flows especially through the redeemed but also, by common grace, even through many who are not redeemed. Their mandate includes human multiplication, subduing and ruling the Earth, transforming the wilderness by cultivation into a garden, and guarding that garden against harm. It is significant that Revelation 21 presents the new creation not as a wilderness or even as a garden but as a garden city. This city does not rise Babel-like from human endeavor but descends out of heaven.

As the authors of *Earthkeeping in the Nineties* put it, "redeemed men and women are to be 'fellow heirs' with Christ—Christ, the sustaining logos of the world, in whom all things consist. The idea that humanity—redeemed humanity—is to share in that 'creator' task is clearly the⁸ implication of Romans 8:19..." That passage in Paul's letter to the Romans draws the connection between the liberation of humankind and the liberation of creation: "For the anxious longing of the creation waits eagerly for the revealing of the sons of God. For the creation was subjected to futility, not willingly, but because of Him who subjected it, in hope that the creation itself also will be set free from its slavery to corruption into the freedom of the glory of the children of God. (Romans 8:19-21).

Genesis 1:26-28: The Dominion Mandate

The dominion mandate, then, did not cease with the coming of either sin or redemption. It continued, and all people exercise it all the time—some wisely, righteously, and fruitfully, some foolishly, wickedly, and barrenly. In response to abuses, some critics have blamed biblical teaching for environmental degradation and called for repudiation of the doctrine of human dominion over nature. Yet it is not dominion *per se* but selfish or foolish dominion that leads to environmental abuse. Christians, who seek to be faithful to the Bible, cannot simply abandon its doctrine of dominion.

Some seek to soften the biblical doctrine of dominion by redefining it, in the process replacing rule with service. They often use Genesis 2:15 (the mandate to "cultivate and keep"

the garden) to reinterpret or replace 1:28 (the mandate to fill, subdue, and rule the Earth). Yet while dominion is not exploitation, Genesis 2:15 does not say the same things as 1:28. Garden and Earth differ, and the Hebrew words for *subdue* and *rule* have very different meanings from those for *cultivate* and *guard*. Further, the frequent claim that the Hebrew for cultivate properly means *to serve*—implying that the mandate in 2:15 is for mankind to serve the garden and, by extension, the Earth—is mistaken.⁹

The dominion mandate, then, must be neither repudiated nor softened. Properly understood, it gives human beings legitimate authority to subdue and rule the Earth, progressively transforming it into a garden, indeed a garden city, to serve their needs and the glory of God. Both the dominion mandate and man's creation in the image of God imply human priority over other created things. As Jesus remarked in the Sermon on the Mount, people are of greater importance to God than birds or flowers (Matthew 6:26-30). This principle points to a biblical environmental ethic that puts human needs before others.

Biblical Law: Dominion Is Not License to Abuse

Yet this principle does not imply human autonomy in dominion. The moral law of God—revealed in the two great commandments to love God and neighbor, the golden rule of doing to others as we would have them do to us, the Ten Commandments,¹⁰ and all the moral statutes, ordinances, and precepts sprinkled throughout Scripture—defines righteous dominion. There is no excuse for tyranny, which violates that law. Some specific laws of Scripture have direct relevance to creation stewardship. Consider several examples from the Old Testament.

While people are free to harness animals to perform tasks for them, they must ensure that the animals' needs are met while they labor. The law of Moses contains the prohibition: "You shall not muzzle an ox [preventing it from eating] while it is treading out the grain" (Deuteronomy 25:4). We may infer from this passage a general duty to guard animals.

Yet such laws aim principally at human, not animal, welfare. The Apostle Paul, in quoting this verse, asked, "God is not concerned about oxen, is He? Or is He speaking altogether for our sake? Yes, for our sake..." (I Corinthians 9:3-11). Paul pointed out that the principle was that someone laboring for others should have a share of the production. While that principle entails making sure a laboring animal is properly fed, its primary point is that a laboring *person* should benefit from his labors.

Similarly, when God instructed the Israelites not to destroy fruit trees while besieging a city, He permitted destroying other trees to make siege works. The fruit trees were to be spared because from them the Israelites could eat. The command's focus, then,

Continues on page 6

was on preservation of trees not for their own sake but for people’s sake—not for their intrinsic value, but for their value to people.

Likewise, the focus of an ordinance to help a donkey struggling under an excessive load is more on doing justice to the neighbor who owns the donkey than on care for the animal. The provision that the Israelites’ domestic animals should rest on the Sabbath seems intended mostly to ensure that those who worked the animals should be free to rest on the Sabbath. Yet human benefit from such laws was not exclusive. Israel learned this lesson when God ejected it from the Promised Land so that the land could enjoy the seventy years of sabbatical rest the people had failed to observe.¹¹

Clearly, care must be taken in both interpreting and applying biblical laws to creation stewardship. They tell us that we should care for all that God created: the Earth and the various plant and animal species that dwell in it. But the Scriptures do not tell us which are the most urgent environmental problems for our society today. They do not prescribe precise solutions for those problems. So we must not make biblical texts into clubs with which to strike those who disagree with our assessments of particular environmental problems and their solutions.

Wisdom from Church History and Tradition

Environmental stewardship has not been a main topic of Christian—or indeed any other—thought until recent generations. That should surprise no one when we recall that for most of human history until the nineteenth century, “nature” was in practice not a lovely place to be preserved and in which to escape the stresses of urban and suburban life but a harsh place to be survived and subdued. The one thing nature seemed to do best was to kill.

Pre-modern teaching on creation by Christian thinkers includes significant tensions. Some lends itself to criticism by modern ecologists as anti-ecological, stripping nature of sacred character and viewing it as mere backdrop for the drama of human salvation and raw materials for human economic production. Other teaching emphasizes nature as God’s self-revelation, as itself praising God, and as deserving admiration and care.

An early representative of the latter thought was Irenaeus of Lyons (ca. A.D. 130-200). In contrast with widespread gnostic thought of his day, Irenaeus believed that the material creation was itself good. While the current plight of creation, dominated by the devil and sinful people, will pass, its essence will be

renewed, and the just will receive the Earth as an inheritance at the resurrection. Therefore, Irenaeus affirmed, human flesh is “not destitute [of participation] in the constructive wisdom and power of God” but will itself be renewed in the resurrection.¹²

An early representative of the more negative view of the material world was Origen (ca. A.D. 185-254). He speculated that when rational souls (*logikoi*, men and angels) sinned, they fell from heaven, by varying degrees. God made the world as a sort of safety net for fallen souls, keeping them from falling all the way into nonbeing. For Origen the material world was a place of probation whence souls could attempt to climb back up to union with the divine, as they repudiated and left behind that material world.¹³

St. Augustine of Hippo (A.D. 354-430) had a much more positive view of creation. Augustine admitted that our limited knowledge and experience prevent humans from understanding how everything God created fits together into a beautiful, harmonious whole. Nevertheless, he urged belief in the beauty and harmony of creation, “lest in the vanity of human rashness we presume to find any fault with the work of so great an Artificer.” Even things that we find inconvenient or harmful to ourselves—even the “eternal fire” of hell—are part of this beauty and “with respect to their own nature... are glorifying to their Artificer.” “All natures, then, inasmuch as they are, and have therefore a rank and species of their own, and a kind of internal harmony, are certainly good.”¹⁴

St. Maximus the Confessor (ca. A.D. 580-662), an Eastern Orthodox mystical theologian, like Origen and indeed Augustine, had a hierarchical view of creation. He assigned human beings the highest rank. He believed that, through grace, they were capable of overcoming the five divisions in reality, including—though in a qualified sense—even that between Creator and creation.

The Five Divisions of Reality According to Maximus the Confessor				
Uncreated Nature	What is perceived by the mind		Created nature	
	God	Heaven	What is perceived by the senses	
Paradise			Earth	
Inhabited world				
		Male	Female	

Reality, Maximus thought, was divided in five ways, as shown in the accompanying table.

Strongly influenced by neo-Platonic philosophy and the idea of the “Great Chain of Being” associated with Plotinus (A.D. 205-270), Maximus believed that, according to the “great mystery of the divine purpose,” all divisions must be overcome in a kind of evolution toward divinity achieved by human participation. “In order to bring about the union of everything with God as its cause,” he wrote, “the human person begins first

Continues on page 7

of all with its own division, and then, ascending through the intermediate steps by order and rank, it reaches the end of its high ascent, which passes through all things in search of unity, to God, in whom there is no division.” The person begins by “shaking off every natural property of sexual differentiation into male and female [a differentiation that “depends in no way on the primordial reason behind the divine purpose concerning human generation”] by the most dispassionate relationship to divine virtue”—a union achieved through “perfect knowledge... Then, by a way of life proper and fitting to Saints, the human person unites paradise and the inhabited world to make one earth... Then, through a life identical in every way through virtue with that of the angels, so far as is possible to human beings, the human person unites heaven and earth... [T]hen the human person unites what is perceived by the mind and what is perceived by the senses with each other by achieving equality with the angels in its manner of knowing, and thus makes the whole creation one single creation, no longer divided by what it can know and what it cannot know... And finally... the human person unites the created nature with the uncreated through love... , showing them to be one and the same through the possession of grace, the whole [creation] wholly interpenetrated by God, and become completely whatever God is, save at the level of being.”¹⁵

Although Maximus’s neo-Platonism led him to an unbiblical, deprecatory understanding of sexuality, and although he nearly denied the quintessentially biblical Creator/creature distinction, nevertheless his recognition of the primacy of humankind within creation is clear and, as we have seen, firmly rooted in Scripture. He also believed that creation was a Self-revelation of God and, unlike Origen and others who viewed the material world as evil *per se*, he had a scheme for its redemption.¹⁶

The medieval mystic Hildegard von Bingen (1098-1179) reported a vision in which God said: “I, the highest and fiery power, have kindled every spark of life... I remain hidden in every kind of reality as a fiery power.” Hildegard described human beings as illumined with the “living breath of the spirit.” The Word of God, in her account, “awakened all creation by the resonance of God’s voice.” God “called creation to himself,” “led all creatures to the light,” and “committed himself to all creation.”

Many people consider St. Francis of Assisi (1182-1226) the “patron saint of environmentalism.” His *Canticle of the Sun* has been an inspiration for many modern environmentalists. David Kinsley calls him “the most unambiguous example in medieval Christianity of the affirmation and embrace of nature.”¹⁷ His early biographer Celano wrote that when Francis

found an abundance of flowers, he preached to them and invited them to praise the Lord as though they were endowed with reason. In the same way he exhorted with the

sincerest purity cornfields and vineyards, stones and forests and all the beautiful things of the fields, fountains of water and the green things of the gardens, earth and fire, air and wind, to love God and serve him willingly. Finally, he called all creatures “brother” and in a most extraordinary manner, a manner never experienced by others, he discerned the secrets of creatures with his sensitive heart.¹⁸

It is not certain, however, that Francis spoke more than metaphorically when he called creatures “brother” and “sister.” Yet his *Canticle of the Sun* rivals some of the Psalms in the poetic grandeur of its appreciation for the natural world:

Most High, omnipotent, good Lord, All praise, glory, honor, and blessing are yours. To you alone, Most High, do they belong, And no man is worthy to pronounce your name.

Be praised, my Lord, with all your creatures,
Especially Sir Brother Sun,
Who brings the day, and you give light to us through him.
How handsome he is, how radiant, with great splendor!
Of you, Most High, he bears the likeness.
Be praised, my Lord, for Sister Moon and the Stars.
In heaven you have formed them, bright, and precious,
and beautiful.

Be praised, my Lord, for Brother Wind,
And for Air, for Cloud, and Clear, and all weather,
By which you give your creatures nourishment.
Be praised, my Lord, for Sister Water,
She is very useful, and humble, and precious, and pure.
Be praised, my Lord, for Brother Fire,
By whom you light up the night.
How handsome he is, how happy, how powerful and strong!

Be praised, my Lord, for our Sister, Mother Earth,
Who nourishes and governs us,
And produces various fruits with many-colored flowers
and herbs.
Praise and bless the Lord,
And give thanks and serve him with great humility.¹⁹

Even in this great poem, however, Francis recognized that the intrinsic value of creatures coexists with their utility value. God gives “light to us” through “Brother Sun,” and by air and cloud and fruits and flowers and herbs God gives “creatures nourishment.”

The great medieval theologian Thomas Aquinas (1225-1274) had a highly anthropocentric and hierarchical view of earthly creation. “As we observe,” he wrote, “... imperfect beings serve the needs of more noble beings; plants draw their nutriment from the earth, animals feed on plants, and these in turn

Continues on page 8

serve man's use. We conclude, then, that lifeless beings exist for living beings, plants for animals, and the latter for man... The whole of material nature exists for man, inasmuch as he is a rational animal." But the usefulness of earth, plants, and animals to man was not solely material but also spiritual, "helping him to know God, inasmuch as man sees the invisible things of God by the things that are made."²⁰

The two great Reformers Martin Luther (1483-1546) and John Calvin (1509-1564) both also wrote things relevant to creation stewardship. Many of Luther's comments about nature present it as an arena in which we suffer God's chastening, meant to lead us to repentance and faith in Christ. "God's wrath," he wrote, "...appears on the earth in all creatures... And what of thorns, thistles, water, fire, caterpillars, flies, fleas, and bed-bugs? Collectively and individually, are not all of them messengers who preach to us concerning sin and God's wrath?"

Yet Luther could also write that "night and day alternate for the purpose of refreshing our bodies by rest. The sun shines that work may be done."²¹ He did not consider the creation itself evil, even though it was destined to be dissolved in judgment because of man's sin and then recreated. The German Reformer interpreted the "vanity" to which God had subjected the creation (Romans 8:20) not as its own corruption and decay but as its being required still to serve people's needs despite their being sinful and unworthy. "For instance," Luther wrote,

...the blessed sun, most glorious of created things, serves the small minority of the godly, but where it shines on one godly man it must shine on thousands and thousands of knaves, such as enemies of God, blasphemers, persecutors, with whom the world is filled... To these it must minister in all their ungodliness and wickedness, permitting its pure and glorious influence to benefit the most unworthy, most shameful and abandoned profligates. According to the apostle, this subjection is truly painful, and were the sun a rational creature obeying its own volition rather than the decree of the Lord God who has subjected it to vanity against its will, it might deny every one of these wicked wretches even the least ray of light; that it is compelled to minister to them is its cross and pain, by reason of which it sighs and groans.²²

Indeed, Luther considered things in nature good in themselves but often abused by humans. "A wicked tyrant, a shameful harlot, may wear gold ornaments. Is the gold responsible for its use? It is the good creature of the Lord our God and fitted to serve righteous people. But the precious product must submit to accommodating the wicked world against its will. Yet it endures in hope of an end of such service—such slavery."²³

Calvin taught that "man was created to be a spectator of the created world, and that he was endowed with eyes for the pur-

pose of his being led to God Himself, the Author of the world, by contemplating so magnificent an image." Yet he also taught that humanity's fall into sin blinded people to the creation's testimony. Romans 1:20, he said, shows that "the manifestation of God by which He makes His glory known among His creatures is sufficiently clear as far as its own light is concerned. It is, however, inadequate on account of our blindness. But we are not so blind that we can plead ignorance without being convicted of perversity."²⁴ Calvin affirmed human dominion over the Earth as taught in Genesis 1 and added that part of "the end for which all things were created" was "that none of the conveniences and necessities of life might be wanting to men," which showed "the paternal solicitude of God for man."²⁵

Modern Christians developing our own understanding of creation care can gain inspiration and insight from the past. But we must be careful not to read into past teachings more than is there. Awe and respect for nature, gratitude to God for it, and a desire to care for creation are all excellent motivations. But they resolve no debates about the reality or extent of environmental problems and answer no policy questions.

Further, it can be anachronistic to expect thinkers before the start of the Industrial Revolution to answer current questions about environmental stewardship. Most did not confront problems comparable to ours. For them and for everyone before the Industrial Revolution, "nature" was not an idyllic place from which to escape the stresses of urban life. Instead it was primarily a harsh surrounding from which one needed protection. Human impact on nature was minimal by comparison with modern economies.

Yet even then, people sometimes exaggerated human impact on the environment. For example, the Church Father Tertullian lamented how the weight of sinful humanity was oppressing the Earth. Writing around A.D.200 (when world population was probably under 500 million), Tertullian saw a grim future as humanity pressed up against supposedly fixed limits to the resources available:

Everything has been visited, everything known, everything exploited. Now pleasant estates obliterate the famous wilderness areas of the past. Plowed fields have replaced forests, domesticated animals have dispersed wild life. Beaches are plowed, mountains smoothed and swamps drained. There are as many cities as, in former years, there were dwellings. Islands do not frighten, nor cliffs deter. Everywhere there are buildings, everywhere people, everywhere communities, everywhere life... Proof [of this crowding] is the density of human beings. We weigh upon the world; its resources hardly suffice to support us. As our needs grow larger, so do our protests, that already nature does not sustain us. In truth, plague, famine, wars and

Continues on page 9

earthquakes must be regarded as a blessing to civilization, since they prune away the luxuriant growth of the human race.²⁶

To put it rather simply, if we go to history and tradition, we may well find helpful insights on our general attitude toward Creator and creation. But we shall be disappointed if from them we expect much help measuring and responding to specific environmental problems today.

Nevertheless, Christians reflecting on the Scriptures and their own situations have carried forward some of the biblical themes sketched above: the unique place of humans in creation; creation as source and motive for praise to God; and the effects of sin and redemption on both humankind and the rest of creation.

Churches' Voices Today

With rare exceptions, churchmen are generally at their best when they speak of Biblical and historical theological principles of environmental stewardship, and at their worst when they speak of scientific and economic aspects. In the latter, their entirely proper tendency toward compassion tends to lead them to embrace, without the due caution Paul's instruction to "test all things, hold fast what is good" (1 Thessalonians 5:21) should generate, claims of extreme environmental harm. Many messages coming from churches promote such environmental misinformation and poor thinking. As early as 1970 the American Baptist Church adopted a "Resolution on Environmental Concerns" that is a model of the exaggerated, context-free, snapshot claims common to the environmental movement:

The rapidly increasing pressure of world population, coupled with massive technological capabilities, constitute an unprecedented threat to the survival of life and beauty on this planet. The quality of our air and water is visibly deteriorating. Indiscriminate use of pesticides threatens to annihilate whole species of animal life and to jeopardize vital links in the food chain. The freedom to enjoy wilderness areas and uncluttered landscapes is rapidly becoming a memory.

It is increasingly evident that the apparent limitlessness of our natural resources is an illusion and the concept of unending economic expansion is now being questioned. The total creation is wondrously interrelated, and annihilation of any link threatens the existence of the whole.²⁷

The U.S. Conference of Catholic Bishops' 2001 statement on climate change, although it included some vague qualifications, embraced the "consensus" view that human action is causing destructive climate change and that prudence requires trying to stop it.²⁸ The Evangelical Lutheran Church in America went so far as to say in 1993 that manmade global warming was more a more serious problem than resource depletion, species extinction, topsoil erosion, and air and water pollution²⁹—although at

that time the evidential basis for the claim was slim at best, it has since deteriorated significantly, as we saw above, and the harm to human life and health from air and water pollution was and continues to be much greater than from global warming. Perpetuating that thinking, the presiding bishop of the ELCA issued a letter on Earth Day in 2007 the buildup of greenhouse gases "sinful treatment of God's gift of the Earth."³⁰ The Presbyterian Church in the U.S.A. adopted "A Brief Statement of Faith" that asserted that human beings "threaten death to the planet entrusted to our care."³¹

The United Church of Christ on June 25, 2007, adopted "A Resolution on Climate Change" that evidenced no awareness of the scientific and economic debate documented above but simply repeated widespread claims and admitted "Christian complicity in the damage human beings have caused to the Earth's climate system and other planetary life systems" and expressed "profound concern for the pending environmental, economic, and social tragedies threatened by global warming, to creation, human communities and traditional sacred spaces." It resolved "to respond to global warming with great urgency and firm leadership by supporting mandatory measures that reduce the absolute amount of greenhouse gas emissions, and in particular emissions of carbon dioxide, to levels recommended by nationally and internationally recognized and respected scientific bodies."³² Similar statements have been issued by the World Council of Churches³³ and the National Council of Churches.³⁴

An important exception to the generally poor quality of most ecclesiastical pronouncements on global warming was a resolution adopted in June 2007 by the Southern Baptist Convention, which recognized climate change as primarily natural and cyclical and asserted that attempts to mitigate it were more costly than whatever benefits might be expected from it.³⁵ The statement displayed an awareness of scientific and economic arguments pro and con on the issue. Likewise, the National Association of Evangelicals adopted "For the Health of the Nations: An Evangelical Call to Civic Responsibility" that made measured, if vague, statements on environmental stewardship and said nothing specifically of climate change.³⁶

Blest Be the Ties that Bind: Matters of Ready Consensus Among Christians

Despite all the matters on which Christians can and do disagree about creation care, there are matters on which we can all agree.

All should join together in praising God for the beauty and goodness of His creation and its testimony to His wisdom, power, and goodness.

All should appreciate the connection, in God's providential plan, between the fate of humankind and the fate of the cre-

Continues on page 10

ation. All should grieve the brokenness that afflicts the creation as the result of human sin. And all should look toward the hope of God's redemption in Jesus Christ, liberating both humans and the entire creation from their bondage to sin and death.

All should accept our human responsibility as God's stewards on the Earth, called to rule and care for it to His glory. All should understand that this dominion does not mean autonomy. We will have to render an account for our stewardship, under the strict standards of God's moral law.

All should be committed, as stewards under that moral law, to caring for the rest of God's creatures, protecting them from senseless harm. God created them and pronounced them "good." He cares for them, and we as His image bearers should follow His pattern. Yet we should follow God's pattern fully, not only caring for other creatures but also caring more for human beings.

All should be committed, in particular, to protecting the most vulnerable people among us. In large measure this means the poor, whose very poverty makes them vulnerable to malnutrition, disease, hunger, and premature death. While Scripture forbids partiality either for or against the poor, still it often associates help for the poor with justice, because the poor are particularly vulnerable to injustice.³⁷

This concern entails looking carefully at the potential for various environmental hazards to harm the poor more than others. It also involves being watchful for the potential that environmental policy itself might have unintended consequences that harm the poor—as when environmental regulations or energy taxes raise their cost of living or slow economic development that could lift them out of poverty.

Finally, as we weigh the benefits and costs of different policy options for addressing different environmental problems, all should be committed to honesty. That is, we should strive to tell the truth as best we understand it. We must study diligently various sides of controversial issues, remembering that "[t]he first to plead his case seems right, until another comes and examines him" (Proverbs 18:17).

Matters on Which There Should Be Consensus

There are also matters on which there ought to be widespread agreement among orthodox Christians. As the church statements cited above illustrate, there is not currently a consensus on these points. But we believe that the weight of biblical teaching and historical experience is so strong that it cannot credibly be denied:

- Economic development is a good to be pursued (wisely and responsibly) rather than an evil to be restrained. It is the key to alleviating poverty and its attendant ills, including environmental ills.

- Our environmental ideal is not wilderness but rather a garden—or even a city—where nature is used wisely for the benefit of humankind and for the greater glory of God.
- Creative humans enhance and improve what they have been given in nature.
- The environment and the economy are not zero-sum games in which consumers fight for fixed resources. Creative people can enhance, improve, and multiply what they have been given in nature.
- In view of the fall, we must avoid utopian expectations that all problems can be vanquished in the next generation by government fiat. Human sin and its consequences are intractable realities. There will be benefit-cost trade-offs in any policy that we adopt. It is foolish to imagine that we can have perfectly "clean" technologies without unintended side-effects.
- We must avoid the panic of excessive alarmism about the imminent destruction of the planet. Instead we must take a sober and balanced view of the environmental problems that confront us and trust God to give us the means to be responsible stewards if we are attentive and faithful. The resilience of natural systems and the historical record of the environmental transition also offer some reasons for encouragement.

Where the Churches Must Not Bind

One of the Apostle Paul's sternest admonitions was against being taken captive by human traditions masquerading as laws of God. Jesus condemned putting human tradition in the place of God's law and making it the standard by which to judge sin and righteousness. The law of God, and nothing less, is the standard of righteousness.³⁸

One of the characteristics of good human law is that it is stable. The stability of divine law is symbolized in its having been written by the finger of God on tablets of stone "The secret things belong to the LORD our God, but the things revealed belong to us and to our sons forever, that we may observe all the words of this law" (Deuteronomy 29:29).

But the natural and human sciences are a very different realm. Ongoing developments in our understanding of ecology, in technology, and in economic conditions result in constantly changing judgments of "best practices" in creation stewardship. For example, the evangelical authors of *Earthkeeping in the Nineties* pointed out the changing costs and benefits, both financial and environmental, of paper recycling. These made it difficult to judge whether recycling was a best practice. At the time, they wrote, "the use of recycled paper appear[ed] to be only slightly more stewardly than the use of virgin materials."³⁹

Continues on page 11

The comparative economics and ecology of recycling versus making paper from newly logged trees are vastly simpler than the economics and ecology of such enormously complex systems as Earth's atmosphere and the various habitats that shelter global biodiversity. Significant revisions of our understanding of these matters occur over and over. For instance, famed climatologist James Hansen of NASA changed his view from warning of an ice age starting around 2020 to warning of catastrophic global warming. But famed geochemist Claude Allègre went from being one of the earliest to warn of manmade global warming to being one of the chief critics of the theory.⁴⁰ Such rapidly evolving understanding implies that much that we consider understanding at any given time may later turn out to be misunderstanding.

This characteristic of science stands in stark contrast with the stability of Biblical law. It is an important reason why Christians should not presume to make current science or economics the basis for judgments of sin. While government regulation often must be adopted on the basis of shifting science, theological and ecclesiastical judgments of sin and righteousness should be based only on the unchanging standard of God's moral law revealed in Scripture. Only that can bind the conscience. Pronouncements that individuals or churches have a moral obligation to support one or another policy regarding creation care, therefore, are fraught with the danger of substituting changing human standards for the abiding standard of divine law.

Pastors, other religious leaders, and ecclesiastical bodies should exercise great caution in making pronouncements about environmental issues. Particularly, they should refrain from calling sin what cannot be shown to be sin from the unchanging law of God in Scripture. Thus they will avoid making binding pronouncements on questions like these:

1. How do we assess different factors that might be causing global warming?
2. What is the likely extent of future global warming? Will its effects be catastrophic or manageable?
3. Is prevention or adaptation a better strategy?
4. If we seek to prevent global warming, is a given policy too strict, too lax, or just about right?
5. Is global warming our top environmental problem, the issue of the age, or is it a misguided panic?
6. Should U.S. energy policy give greater emphasis to fossil fuels, nuclear power, or solar power? What is the best mix of conserving current energy supplies versus expanding energy supplies?

On none of these questions does the Church have the expertise or the authority to proclaim, "Thus says the Lord." It should leave these matters open for debate among well-intentioned

Christians who agree about their environmental responsibilities while disagreeing about the best means of fulfilling them.

Some Tentative Theses for Further Study

Aside from the biblical teachings on which Christians have or should have consensus, and the scientific and policy questions on which consensus is not possible (or even necessarily desirable at this point), there are also matters that fall into a middle ground. These are matters on which there are no plain biblical directives. Nevertheless, reason and experience point strongly in one direction, I believe. Perhaps further study and the passage of time might yield an informal consensus, although not a binding doctrine.

With that hope, I submit these tentative theses for discussion in the U.S. Christian community:

1. Providing pure drinking water to the poor and protecting them from indoor air pollution may be the most important environmental tasks for today.
2. Preventing predicted global warming is probably near the bottom of the list of environmental challenges.
3. In responding to possible climate changes, adaptation is probably a better strategy than prevention.
4. Over and above specific environmental challenges, overcoming poverty through economic development is the best long-term strategy for improving the environment.
5. The environmental transition is already well advanced in the developed countries, and we should be grateful rather than alarmed at the growth of our economies.
6. The environmental transition is feasible in developing countries, especially with just and accountable governments that allow economic and political freedom to their peoples and thereby reap the benefits of free trade.
7. By contrast, the empowerment of unaccountable international regulatory bureaucracies that rob the sovereignty of more accountable democratic national governments would not be a step in the right direction.

Endnotes:

1. This and all subsequent Bible quotations are from the New American Standard Bible.
2. Genesis 1:4, 10, 12, 18, 21, 25, 31, 29
3. Genesis 1:26, 28; cf. Psalm 8:4-8; Hebrews 1:2-3; 2:8-9
4. Genesis 1:26, 28
5. Genesis 2:16-17; 1:1-3; Revelation 22:1-5

Continues on page 12

Endnotes: *continued*

6. Genesis 3:1-17; Romans 1:21; Ephesians 4:17-18; Titus 1:15; Genesis 2:7, 17; 3:19; Ephesians 2:1-3; 5:11.; Romans 8:22-23
7. 1 Corinthians 15:45; Colossians 2:3; Colossians 3:10; 1 John 2:2; 1 Corinthians 15:45; Mark 4:37-39; 5:21-43; Matthew 14:13-21; Romans 5:9-11, 19, 21; Ephesians 4:24
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10. Matthew 22:37-39; 7:12; Exodus 20:1-17
11. 1 Timothy 5:18; Deuteronomy 5:14; 20:19-20; Exodus 23:5-6; Leviticus 25:3-4; 26:34, 43; 2 Chronicles 36:21; Mark 2:27
12. Irenaeus, *Against Heresies*, 5.36.1, 5.32.2, 5.3.2-3.
13. Origen, *de Principiis*, 5.6.2.
14. Augustine, *City of God*, 12.4.5.
15. Maximus the Confessor, *The Difficulties*, 1304D-1308C, in *Maximus the Confessor*, translated by Andrew Louth (New York: Routledge, 1996), 156-8.
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18. Cited in Kinsley, 122.
19. Cited in Roger Sorrell, *St. Francis of Assisi and Nature* (Oxford: Oxford University Press, 1988), 68.
20. Cited in H. Paul Santmire, *The Travail of Nature: The Ambiguous Ecological Promise of Christian Theology* (Philadelphia: Fortress Press, 1985), 91-2.
21. Cited in Kinsley, "Christianity as Ecologically . . .," 111-112.
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23. Martin Luther, Sermon on Romans 8:1822, Fourth Sunday After Trinity, 1535, in *The Complete Sermons of Martin Luther*, 7 vols., ed. John Nicholas Lenker, trans. John Nicholas Lenker et al. (Grand Rapids: Baker, 2000), 4.2.96-118, at 105-107.
24. John Calvin, *The Epistles of Paul the Apostle to the Romans and to the Thessalonians*, trans. Ross Mackenzie, ed. David W. Torrance and Thomas F. Torrance (Calvin's Commentaries, 12 vols.; Grand Rapids: Eerdmans, 1973), 8:31.
25. John Calvin, Commentaries on the *First Book of Moses Called Genesis*, trans. John King (Calvin's Commentaries, 22 vols.; Grand Rapids: Baker, 1984), 1.1.96.
26. Tertullian, *Opera II: Opera monastica*, cited in Susan Power Bratton, *Six Billion & More: Human Population Regulation and Christian Ethics* (Louisville, KY: Westminster/John Knox Press, 1992), 76.
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38. Colossians 2:1-4, 8, 18-23; Matthew 15:1-6
39. Wilkinson, ed., *Earthkeeping in the Nineties*, 381-2.
40. John McCaslin, "Cold Yet?," *The Washington Times*, September 19, 2007, online at <http://www.washingtontimes.com/article/20070919/NATION02/109190067>; Lawrence Solomon, "Allegre's Second Thoughts," *Financial Post*, March 2, 2007, online at <http://www.canada.com/nationalpost/news/story.html?id=2f4cc62e-5b0d-4b59-8705-fc28f14da388>.

Prescient Thoughts From The Past

Notes

- ◆ As we reported some months ago, there is an unprecedented and unexplained decline in amphibian populations around the world. Scientists are at a loss to explain these serious declines since none of the usual culprits like pollution or overpopulation or temperature changes can account for the fact that the decline is worldwide.

Now there is a similar disappearance of fungi all over Europe. It is being described as a "catastrophic decline" or as "mass extinction" by scientists working in the area. Overpicking has been ruled out as a factor because both edible and inedible species are affected. This may be more serious than it would seem to be at first blush. While gourmets may be able to do without mushrooms, forests may not. The fungi which are being threatened live in close symbiotic relation with trees, furnishing water and minerals in exchange for carbohydrates. Without the help of fungi the trees may not be as stress resistance as they are.

There seems little doubt about the decline of species. There is very little understanding of what is happening and even less of what can be done, if anything.

- ◆ Perhaps you may have noticed a report or two in your local paper that late last summer a new iceberg detached itself from the Antarctic ice sheet and is adrift in the Weddell Sea. This iceberg is about the size of the State of Connecticut, approximately 5,000 square miles. It is slowly drifting toward the Falkland Islands. There is little danger to shipping from the large iceberg, but it could present a problem when it begins to shed small bergs.
- ◆ A court settlement was reached about two months ago that requires that the environmental risk of work, funded by the U.S. Army's biological defense program and done on hazardous organisms in high containment (BL-3 and BL-4) labs, must be reported before the work starts. This suit was initially brought by Jeremy Rifkin and the Foundation on Economic Trends in 1987. All the biological defense work that goes on in such labs will be subject to public review for environmental risks. Rifkin, evidently, is going to push to have the same requirements apply to other agencies like the National Institutes of Health and the Department of Agriculture.

This settlement requires the military to respond to negative findings in a safety review by the Occupational Safety and Health Administration. It also requires an extensive list of environmental assessments and environmental impact statements

of the centers doing the research. These are the basic requirements.

Deep down, while I'm in favor of such reviews in general, I wonder about the "public" aspect of this. I feel I know as much about such scientific protocols as the average well-educated layman. Yet I would not consider myself to be at all competent to judge such reports. I think I'm asking what "public" means. Is "public" to be defined as Rifkin and his Foundation? Or is it broader? Should it be limited to Rifkin? Can it be broadened without destroying the possibility of carrying on research? These are questions which will quite probably be issues in future court rulings.

- ◆ Alaskan environmental agencies and oil industry officials are both pressing for permission from federal and state regulators to spill oil. The purpose is to determine how well federal or industrial emergency response teams can deal with a future accidental oil spills. They would like to spill and then set on fire tens of thousands of gallons of crude oil in the Beaufort Sea north of Alaska. The Beaufort Sea, which is ice-choked, is often subject to very rough weather. The fear is that conventional means for cleaning up oil spills in more temperate climates may not work for oil spills in the Beaufort Sea. Researchers would like to test alternative clean-up methods with a small controlled spill.

They would like to see, for instance, if burning off the spill would be better than attempting to clean it up. They could also check the smoke plume for chemicals in order to gauge the pollution hazards. Local environmental regulators have given tentative approval. The Environmental Protection Agency's approvals is needed and, at present, the EPA seems quite jittery about granting it. Also, the Alaska Regional Response Team, composed of 14 state and government agencies, denied permission to conduct a smaller "demonstration" spill in 1991. It has given "conceptual approval" to the Beaufort experiment and has demanded the submission of plans in "intricate detail." The experiment's proponents wonder if the risk of not doing the experiment might be greater than the risks of doing it.

- ◆ Twenty-five centuries ago the Pythagoreans thought that the revolutions of the heavenly bodies created music that blends into a cosmic harmony. Now, astronomers are tuning in not to the revolutions of the stars but to their vibrations. These vibrations, seen as variations in brightness, penetrate to the star's interior. Theoretically, measur-

Continues on page 14

ing these fluctuations in brightness can offer a means for exploring that interior. Recently a painstaking recording of these fluctuations in a white dwarf star has identified 101 frequencies with periods ranging from 400 to 1000 seconds. These fluctuations are probably only the very largest waves, the other being wiped out by the enormous differences involved. While the sun gently resonates with acoustic (pressure) waves, a white dwarf beats with pulses called gravity waves. Because of the large number of frequencies they were able to record the researchers hope in the next few years to be able to develop a rather detailed map of the star's interior.

Besides answering questions about a star itself, the data on white dwarf stars could lead to a new estimate of the age of the Milky Way galaxy. Other research teams are beginning to study other types of stars (like brown dwarfs and neutron stars). This area of research will probably grow rapidly.

Reflections

The debate about the storage of nuclear waste continues unabated. By the year 2000, we in the United States will have approximately 40,000 metric tons of nuclear waste to dispose of. It is estimated that by 2035 that will have increased to something like 85,000 metric tons. We as a people have been arguing (wrangling might be a better word) about what to do with that waste for decades, in fact, since we began using nuclear power as an energy source.

In its own way the nuclear waste situation can stand as a paradigm for many of the science-technology-society-religion issues of our time. It contains in itself many of the factors that go into the debate over science and technology both as it concerns society and the faith.

A distinction which is very rarely made in a significant way in the media between risk assessment and risk perception. There is a "science" of risk assessment that involves a very demanding study of risk factors in any given situation. It is built on assumptions that, of course, cannot be proved. Yet is a fairly reliable guide to the dangers in a given situation or process. It is far from perfect and at its best it gives the probabilities of x happening, or of y happening compared with z happening. In the last analysis, a great deal of public policy is determined by risk perception, not by risk assessment. Nuclear power is a perfect example of this.

In the thirty years or so since we began generating electric power in nuclear reactors, there has not been a single death directly attributed to nuclear power. During the same time approximately 1.5 million people have died in automobile crashes. Yet, if you were to ask people which is safer, nuclear power

generation or driving, I am confident that the majority would say that driving is safer. In our automobiles we have the *illusion* of control while we feel helpless in the face of nuclear power. This is certainly an element in our perception of the risks involved.

For whatever reason there is a deep fear of *radioactivity* in the general public. Part of this fear certainly comes from the development of atomic and nuclear weapons. An aspect of the weapons factor in the creation of this fear is certainly the devastation of Hiroshima and Nagasaki. Also, there is a great deal of public ignorance and deliberate misinformation about radiation involved in these issues. How many people know that there are different kinds of radioactivity (alpha particles, beta particles, gamma rays and neutrons) and that they behave differently? How many people realize that an ordinarily energetic alpha particle can be stopped by a piece of cigarette paper?

As to misinformation, we had all the hype about "things glowing in the dark" after the accident at Three Mile Island. Media hype is also a factor in the perception of risk.

Besides risk perception, there is what I would call an "unreality factor" of significant proportions. Some of the high level radioactive waste has a half-life of 600,000 years. So, it has become part of the prevailing wisdom that we must be able to provide a repository for this waste that we know will be stable for those 600,000 years. This is a storage condition that literally makes the storage problem insoluble. Worse, it reduces the effort even to consider a solution to absurdity.

Few people stop to think about the absurdity of making a prediction of what things will be like 600,000 years from now. That is three to four times longer than there has been a species *homo sapiens sapiens*. We have no clear idea what the world was like 600,000 years ago, yet we demand a storage site that will not change significantly for the next 20,000 generations of human beings. How absurd can we get?

In his work, *Meaning in History*, Karl Löwith writes of Proudhon:

Proudhon had the keenest insight into the anti-Christian implications of the modern religion of progress. He is the theologian of progress and, as such, the most radical critic of providence; for he understood that the recognition of and submission to either pagan fate or Christian providence is incompatible with the faith in progress, which is essentially revolutionary and worldly...

Then, quoting Proudhon, he continues:

"We attain to science in spite of him (God), to wellbeing in spite of him: every progress is a victory in which we crush the deity." By and by man will become the master of creation and thus equal God. Instead of man's being

created in the image of a providential God, God is created in the image of man's power of foreseeing and providing.

Ironically, the public is demanding now of scientists and technologists a capacity for human prevision greater than they would expect from God's Providence. There is something deeply anti-Christian both in the fear surrounding nuclear waste disposal and the preposterous demand for such human pre-vision and assumed control over the geological tides of a half million years and more.

In an interesting article in the December 13th issue of *Science*, entitled "Perceived Risk, Trust, and the Politics of Nuclear Waste," Paul Slovic, James H. Flynn and Mark Layman attempt to analyze the fearful perceptions people have of anything involving radioactivity. In it they report:

Yet, at this time the DOE program (the Department of Energy program for a permanent repository for nuclear waste at Yucca Mountain, Nevada) has been brought to a near halt by overwhelming political opposition, fueled by perceptions of the public that the risks are immense. These perceptions stand in stark contrast to the prevailing view of the technical community, which argues that nuclear wastes can be disposed of safely, in deep underground isolation. Officials from DOE, the nuclear industry, and their technical experts are profoundly puzzled, frustrated, and disturbed by public and political opposition that many of them consider to be based on irrationality and ignorance.

A study done by the authors on 3334 respondents produced a combined total of 10,000 word-association images to the repository notion. Only one percent of these 10,000 were "positive." The rest concerned such "negatives" as: dangerous/toxic, death/sickness, environmental damage, leakage, destruction, pain and suffering, uninhabitable, and so on. The writers state that the negativity of repository images was consistent across demographic lines, across men and women of different ages, incomes, education levels and political persuasion.

Presumably, then, this is true of religious persuasion as well. Evidently the fear of nuclear technology is one of the few things our culture can agree on almost totally. Curiously, the authors find of the great sources of this fear to be the concept of *transmutation* — "the passage through destruction to rebirth." They quote S. Weart, *Nuclear Fear: A History of Images*, Harvard Univ. Press, 1988):

In the early decades of the 20th century, transmutation images became centered on radioactivity, which was associated with "uncanny rays that brought hideous death or miraculous new life; with mad scientists and their

ambiguous monsters; with cosmic secrets of death and life... and with weapons great enough to destroy the world...

In addition there remains the fact that nuclear power was achieved secretly in wartime and first used to destroy. There is quite clearly a crisis of confidence connected with nuclear power and with our technical ability to control it. Nuclear power (or anything connected with radioactivity) is seen by very many to be a demonic force. That is strange language to use in an age that shows little faith in God. Yet to paraphrase Chesterton, in an age of unbelief credulity reigns supreme. Somehow the government and the nuclear industry have a great stake in changing perceptions and winning back people's trust.

On the religious side, we have a great deal of work to do reversing the centuries-long slide toward unbelief. I personally think we'll do little to accomplish this with "updating our theologies." We need to go back, as I see it, and re-establish our faithful acceptance of the whole doctrinal tradition and call people back to the essential meaning of our Eucharistic worship. We must restore our own faith in God's providence and the non-demonic nature of reality, even of nuclear radioactivity.

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Fr. Robert Brungs, SJ

From *Notes and Reflections*, 1992

Monthly Subscription Service for Bishops 1991-1997

Early in the decade of the 90s Father Brungs, with information received from bishops around the world, saw the need to keep the bishops and their staffs informed about scientific and technological issues that could have an impact on the churches locally and internationally. In order to fill this need, Fr. Brungs designed a monthly subscription service in two parts: 1) **Notes** -- a one page summary of several items from current scientific journals which could be read and "digested" within a short time; and 2) **Reflections** -- a longer two page thought piece on a timely specific topic. Some of the bishops who subscribed indicated that they often read **Notes and Reflections** as they traveled to various meetings around the country. Also, those who subscribed to this service spanning seven years (1991 – 1997), commented that it was most helpful in keeping them abreast of sci/tech developments not ordinarily encountered in their daily reading.

The editors chose to publish the January issue printed above and written 18 years ago for several reasons. We thought it was a suitable "companion piece" for Cal Beisner's article on environmental stewardship and because the **Reflections** piece reveals Fr. Brungs' deep level of perception and understanding of scientific issues at a time when intense scrutiny of sensitive topics, the environment, among others, began to command bold news headlines.

## Letter To The Editor:

*Response to Paul Driessen's essay, DDT: A Weapon of Mass Survival, published in the Spring issue of the Bulletin and delivered at the 2009 ITEST conference, Environmental Stewardship in the Judeo-Christian Tradition*

Dear Editor:

Not only was I privileged to hear Dr. Paul Driessen give this presentation at the October, 2009 ITEST Conference but also I have traveled to five countries in Southern Africa on two different journeys. Those countries are: South Africa, Swaziland, Botswana, Zambia, and Zimbabwe. The poverty is astounding! I am going to limit my comments to the conditions I found in South Africa. I am not a scientist, just an observer of the planet and its people. I am a woman of faith.

The poorest of the poor are living in cardboard huts, similar to those of our homeless people and the high school and college privileged who experience what living in poverty for one night or a weekend is like. The less poor consider themselves privileged to have a one room concrete block home with a door and windows and a mud floor for their entire family. They consider it a luxury to have one cold water running faucet inside their home. Toilets are an outdoor affair. Despite the mud floors the people keep their homes spotlessly clean. I saw women and children sweeping the dirt floors of their homes and the dirt outside the home many times a day. Grass is unheard of. The only heat is a wood or coal burning stove. Who can use bed netting when you may not even have a bed? Who can use netting if the mattress had to be put against a wall during the day so there is some living space? It is an unheard of luxury to have screens on the windows and doors. As a result most of these people have mosquito bites, and malaria runs rampant. Add malaria to the long list of problems faced by these people: hunger, AIDS, low paying jobs or no jobs at all, TB, little or no schooling, among others!

Dr. Driessen asserts that a simple spraying of minimal amounts of low dosage DDT on the inside of these homes once or twice a year would keep the people malaria free. The cost is incredibly inexpensive! The result is incredibly beneficial.

Don't we as Christians have a responsibility to provide the best possible preventative medicine and usages for our brothers and sisters? Can we speak in the public forum with knowledge and authority and cause change? Can we allow such short-sightedness to continue to the detriment of our brothers and sisters? Do we really believe that what is good for the USA is good for every country and every condition in the world?

My suggestions are to pray and spread the word. Read Dr. Driessen's book *Eco-Imperialism: Green power-Black death* to inform yourself. Then, give a copy to your church library, public library, and to friends and colleagues. Become an advocate. Call and write your representative and senators in Congress. Doing nothing adds to the problem. As ITEST members we are suppose to be actively pursuing the best science and the best religious beliefs and use those two tools to make the world a better place for everyone.

*Evelyn P. Tucker, Program Manager for Exploring the World, Discovering God (EWDG) at ITEST and Director of the RCIA at Assumption Parish in Affton, Missouri.*



Saturday, September 25 - 9:00 – 3:30  
Cardinal Rigali Center  
St Louis, Missouri

Bring your friends and celebrate with us during this ITEST conference on Food-- genetically-modified and organically grown. Enjoy this one day workshop on Saturday, September 25 from 9:00 – 3:30 at the Cardinal Rigali Center in St Louis, Missouri. We will hear about genetically modified food and bridging the gap between science and society from Eric Sachs of Monsanto; the benefits of organically produced food from a local advocate and finally the importance of food in scripture as a teaching tool by Sister Mary Margaret Pazdan, OP.

Registration materials will be sent out in early August, but don't forget to mark your calendars today. Group rates for 10 or more are available. For more detailed information please contact Sister Marianne, RSM at 314.792.7220 or at [mariannepost@archstl.org](mailto:mariannepost@archstl.org).