

Science-Faith Synergy: Glorifying God and Serving Humanity



*"Wisdom is supreme; therefore get wisdom.
Though it cost all you have, get understanding."*

Proverbs 4:7, NIV



July 29–August 1, 2011

North Central College
Naperville, IL

Hosted jointly by Wheaton College

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*Student or early career scientist presenting a paper through donated scholarships.

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General Information

ASA Book Room

Book tables featuring books of interest to attendees will be in the Fine Arts Center. Hours are as follows:

Saturday: 10:00 AM–5:30 PM Wentz Concert Hall Lobby

Sunday: 12:45 PM–5:30 PM Wentz Concert Hall Lobby

Monday: 10:00 AM–2:00 PM Madden Theater Lobby

The North Central College Bookstore is open Monday to Friday, 9 AM–4 PM; Saturday, 10 AM–2 PM.

Emergency Phone Numbers

Ward Hall Information Desk: 630.637.5846 8 AM –10 PM

Campus Safety: 630.637.5911 10 PM – 8 AM

Plenary Sessions

All plenary sessions, except the Sunday morning session, will be held in the Wentz Concert Hall in the Fine Arts Center (FAC). The Sunday morning session will be held in Centennial Hall on the third floor of the White Activities Center (WAC).

Friday:	7:30 PM	Mary Schweitzer, “Dinosaurs under the Microscope: A New Look at Old Dinosaurs”
Saturday:	8:30 AM	William Hurlbut, “Stem Cells, Embryos and Ethics: A Continuing Controversy”
	1:15 PM	Gareth Jones, “Glorifying God in a Scientific Milieu: The Contrasting Domains of Neuroscience and Reproduction”
	8:00 PM	Katharine Hayhoe, “Climate Change: Why Are Science and Faith in Conflict?”
Sunday:	10:30 AM	Dorothy F Chappell, “Challenges, Changes and Chalices in the Natural Sciences”
	1:30 PM	Steven Bouma-Prediger, “One Example of Science-Faith Synergy: How We Can Glorify God and Serve Humanity by Caring for the Earth”

Special Events

Friday:	9:00 AM	Workshop: Science and Scripture: Interpreting the Information –FAC Room 114
	1:00 PM	Workshop: Helping Your Congregation Deal with Religion-Science Issues –FAC Room 138
	9:00 PM	Fellowship Mixer –Wentz Concert Hall Lobby
Saturday:	10:00 AM	Symposium: Global Meat Consumption: Health, Environmental and Ethical Concerns –Madden Theater
	10:00 AM	Symposium: Probing the Past: Contributions from Paleontology and Archaeology –Wentz Concert Hall
	2:30 PM	Symposium: Bioethics –Wentz Concert Hall
	6:45 PM	ASA Business Meeting –Wentz Concert Hall
	9:00 PM	Students and Early Career Scientists Reception –FAC Room 114
Sunday:	9:00 AM	Worship Service –WAC Centennial Hall
	6:45 PM	Women in Science Gathering –FAC Room 114
	7:30 PM	“Test of Faith” –FAC Madden Theater
	7:30 PM	Communications Meeting –FAC Room 114
	7:30 PM	Career Progression for Christians in Science: Panel Discussion –FAC Room 138
	9:00 PM	InterVarsity Reception –FAC Room 138
Monday	9:00 AM	Symposium: Methodological Naturalism: Glorifying God through Science? –FAC Madden Theater

Check-out

Monday: 2:00 PM If you are staying on campus, please return your room keys to the NCC staff

Many thanks to ...

Program Chair **Rod Scott** and Local Arrangements Chair **Ray Lewis**.

We are especially thankful for the **donors** who contributed to the Students and Early Career Scientists' Scholarship Fund.

The ASA Spirit

The American Scientific Affiliation encourages thoughtful and provocative scientific presentations and discussions. Presenters and discussants are expected to maintain a humble and loving attitude toward individuals who have a different opinion.

2011 ASA Annual Meeting Schedule

- All sessions except those on Sunday morning will be held in the Fine Arts Center (FAC). Sunday morning breakfast, worship, and plenary session will be held in the White Activities Center (WAC).
- All meals except for Sunday morning breakfast are in the Kaufman Dining Hall.
- Abstracts for each session are listed on the page numbers in parentheses.

Thursday, 28 July 2011	
3:00 PM–9:00 PM	Lodging registration at the Residence Halls
3:00 PM–9:00 PM	ASA meeting registration, FAC/Wentz Concert Hall Lobby

Friday, 29 July 2011	
7:30 AM	Breakfast –All meals except for Sunday breakfast are in the Kaufman Dining Hall.
8:15 AM–9:00 PM	Lodging registration at the Residence Halls
8:15 AM–9:00 PM	ASA meeting registration, FAC/Wentz Concert Hall Lobby
8:30 AM–5:30 PM	ASA/Affiliation of Christian Geologists Geology field trip
8:30 AM–12:00 PM	Morton Arboretum field trip
9:00 AM–4:00 PM	Workshop 1: Science and Scripture: Interpreting the Information – Terry Morrison , FAC Room 114
12:00 PM–1:00 PM	Lunch
1:00 PM–4:30 PM	Workshop 2: Helping Your Congregation Deal with Religion-Science Issues – George Murphy , FAC Room 138
1:00 PM–5:00 PM	Fermilab field trip
1:00 PM–5:00 PM	Wheaton College field trip
5:30 PM–6:45 PM	Dinner
7:00 PM	Welcome and Introductions, FAC/Wentz Concert Hall <ul style="list-style-type: none"> • Randy Isaac, ASA Executive Director • Susan Daniels, ASA Executive Council President • Dorothy Chappell, Wheaton Representative • Rod Scott, Program Chair • Ray Lewis, Local Arrangements Chair
7:30 PM	Plenary Session I , FAC/Wentz Concert Hall Moderator: Keith Miller Mary Schweitzer , "Dinosaurs under the Microscope: A New Look at Old Dinosaurs" (6)
9:00 PM	Fellowship Mixer, FAC/Wentz Concert Hall Lobby

Saturday, 30 July 2011	
7:15 AM	Breakfast
8:00 AM	Devotions: Bob Geddes , FAC/Wentz Concert Hall
8:30 AM	Plenary Session II , FAC/Wentz Concert Hall Moderator: Brian Greuel William Hurlbut , "Stem Cells, Embryos and Ethics: A Continuing Controversy" (6)
9:30 AM	Refreshment Break, FAC/Wentz Concert Hall Lobby

Saturday, 30 July 2011				
Parallel Session I	I-A. Seeking God's Wisdom for Science Teaching –Room 114 (11–13) Moderator: Sara Miles	I-B. Environmental Stewardship –Room 138 (13–15) Moderator: Darren Craig	I-C. Symposium: Global Meat Consumption: Health, Environmental and Ethical Concerns –Madden Theater (7–8) Moderator: Jay Hollman	I-D. Symposium: Probing the Past: Contributions from Paleontology and Archaeology –Wentz Concert Hall (8–9) Moderator: Steve Moshier
10:00 AM	Denis O Lamoureux "Teaching Science and Religion: Some Mid-Career Reflections and Suggestions"	Peter M J Hess "Replacing 'Human Exceptionalism' with an Integrated Environmental Ethic"	Martin M Root "How Does What We Eat Create Chronic Disease?"	Keith B Miller "The Study of Paleontology and the Creation Mandate"
10:30 AM	Keenan E Dungey "Beyond Two Books: Metaphors for the Relationship between Science and Religion in the 21st Century"	Thomas L Walters "All Data Are Equal, but Some Are More Equal Than Others"	Steven G Hall "Environmental and Ethical Implications of Meat Consumption"	Ken Wolgemuth "Radiocarbon—Methods of Dating Materials for Biblical Archaeology and Earthquakes in the Dead Sea Area"
11:00 AM	John Staver "Defeating the Teaching of Creationism in the Public School Science Classroom"	John Munday "Earth Day: Origin and Development"	Jerry L Risser "Animal Rights or Responsible Stewardship?"	Stephen O Moshier "Physical Geography of the Eastern Nile Delta during the Bronze Age: Implications for the Location of the Red/Reed Sea"
11:30 AM	Mark Winslow "The Role of Faith Structures in Mediating Christian University Biology-Related Majors' Reconciliation of Evolution and Personal Religious Beliefs"		James Thobaben "Food as a Moral Object: The Ethics of Eating"	James K Hoffmeier "The Location of the Red/Reed Sea in the Light of Recent Archaeological Work in Egypt"
12:00 PM	Lunch			
1:15 PM	Plenary Session III, FAC/Wentz Concert Hall Moderator: Brian Greuel Gareth Jones , "Glorifying God in a Scientific Milieu: The Contrasting Domains of Neuroscience and Reproduction" (6)			
Parallel Session II	II-A. Seeking God's Wisdom for Science Teaching (cont'd) –Room 114 (11–13) Moderator: Sara Miles	II-B. Environmental Stewardship (cont'd) –Room 138 (13–15) Moderator: Heather Whitney	II-C. Seeking Wisdom in Science –Madden Theater (15–17) Moderator: James W Sire	II-D. Symposium: The Ethics of Neuroscience and Reproduction –Wentz Concert Hall (9–10) Moderator: Brian Greuel
2:30 PM	Stephen M Contakes "Chemistry as a Source of Wisdom: The Chemistry Curriculum as a Tool for Exploring Faith-Science Dialogue"	Oscar E Gonzalez "How to Engage Evangelicals in Conservation: The Implementation of Creation Care in Peru"	Peter Payne "Does the Success of Science by Itself Provide Strong Support for Naturalism?"	Heather Looy "'Reorientation' Therapies and Same-Sex Desire: Are they Effective and Ethical?"
3:00 PM	Bryce Sullivan "Christian Faculty at Christian Colleges and Universities: Sine Qua Non?"	David W Hoferer "Conservation and Christ: Insights for Participating in the Redemption of the Whole World"	Dominic Halsmer "Metaphysical Considerations Enhance Reverse Engineering Studies"	William M Struthers "The Reproductive Brain: Neurosexism and the Ethics of Sexuality"
3:30 PM	Beverage Break, FAC/Wentz Concert Hall Lobby			
4:00 PM	Douglas Hayworth "Challenges in Establishing an ASA Homeschool Science Resources Website"	Don W Korte Jr and Mary H Korte "Caring for Creation at Concordia University Wisconsin: Bluff Restoration and the Concordia Center for Environmental Stewardship"	Matthew M Huddleston "Myth and Mystery: Fostering New Avenues of Dialogue for Faith and Science"	Brian T Greuel "Epigenetic Mechanisms in Human Reproduction and Disease: An Ethical Analysis"

Saturday, 30 July 2011				
4:30 PM	Pilju Kim Joo and Joshua J Song –“Role of PUST for North Korean Agricultural Development and Food Security through Life Science Research”	Ray Williams “Science and God’s Earth-Protect Mandate”	Robert S Geddes “Fossils from Space: A Believer’s Challenge or Blessing”	Panel Discussion • Heather Looy • William M Struthers • Brian T Greuel • Gareth Jones • William Hurlbut
5:00 PM	Bryan Clarke “Researching Science and Religion: Thoughts about Engaging in the Classroom”			
5:30 PM	Dinner			
6:45 PM	ASA Business Meeting , FAC/Wentz Concert Hall (29)			
8:00 PM	Plenary Session IV , FAC/Wentz Concert Hall Moderator: Steve Moshier Katharine Hayhoe , “Climate Change: Why Are Science and Faith in Conflict?” (6)			
9:00 PM	Students and Early Career Scientists Reception with Katharine Hayhoe , FAC Room 114			

Sunday, 31 July 2011				
7:30 AM	Deluxe Continental Breakfast at White Activities Center, first floor			
9:00 AM	Worship Service , White Activities Center, Centennial Hall, third floor Jennifer Powell McNutt			
10:00 AM	Break, White Activities Center, first floor			
10:30 AM	Plenary Session V , White Activities Center, Centennial Hall, third floor Moderator: Rod Scott Dorothy F Chappell , “Challenges, Changes and Chalices in the Natural Sciences” (6–7)			
12:00 PM	Lunch			
1:30 PM	Plenary Session VI , FAC/Wentz Concert Hall Moderator: Ray Lewis Steven Bouma-Prediger , “One Example of Science-Faith Synergy: How We Can Glorify God and Serve Humanity by Caring for the Earth” (7)			
2:45 PM	Beverage Break, FAC/Wentz Concert Hall Lobby			
2:45 PM	Poster Session , Wentz Concert Hall Lobby (21–24) ♦ Caleigh Bates and Christine Williams , “The Use of Genetic-Based Research in the Combat of Neglected Tropical Diseases: The First-World Response to the Majority World Problem” ♦ Virginia R Bracht , “An Evaluation Scheme to Increase the Effectiveness of Development Work” ♦ Hui-Yiing Chang , “Temporal ‘Centrality’ of Earth’s Existence in the Universe?” ♦ Manika Clemente , David Lee , and Annie Poirier , “Alternative mRNA Splicing and the Expansion of the Human Proteome” ♦ Valerie Francis and Elyse Masson , “The Absence of CCR5 Co-receptors and HIV Resistance” ♦ Taylor Gevry and Joanna Helm , “Genetic Conservation and the Reintroduced Gray Wolves of Yellowstone” ♦ Michael D Guebert , “Serving Humanity through Water, Sanitation and Hygiene Technology: Serving and Learning through a Year-Long Course Sequence” ♦ Jay L Hollman , “Science in the Prevention of Chronic Disease: A Mixed Review” ♦ Katey LePage and Morgan Manchester , “Genetics and Personalized Medicine” ♦ Craig Rusbult , “Thinking Skills Education: Using Design Method and Scientific Method” ♦ Kyle Tretina and Laura Frantz , “Race and Medicine: Enelapril”			
Parallel Session III	III-A. Witnessing God’s Glory and Sovereignty in Creation –Room 114 (17–18) Moderator: Dave Sikkenga	III-B. God’s Will and Origins –Room 138 (18–19) Moderator: Marilyne Flora	III-C. Seeking Wisdom in Science (cont’d) –Madden Theater (15–17) Moderator: Dillard Faries	III-D. Worldview Perspectives and Creation Debates –Wentz Concert Hall (19–20) Moderator: Robert Bishop
4:00 PM	Donald N Petcher “Quantum Openness and the Sovereignty of God”	Gregory S Bennett “God’s Providence in Nature: The Forgotten Doctrine in the Relationship between Science and Faith”	George L Murphy “Kenosis and the Inspiration of Scripture”	Richard F Carlson “Biblical Portraits: Creation and Worldview”

Sunday, 31 July 2011				
4:30 PM	Paul H Lange "Prayers for Healing: Does God Change His Mind?"	David Wilcox and David W Hoferer "Dysteleology, Holoteleology, or Intelligent Design"	David S Newman "Uncertainty, Determinism, Scientific Method, and the Wisdom of Franz Boas"	Stephen C Dille "Making Converts to Evolution': Methodological Naturalism as a Rhetorical Weapon in the <i>Origin of Species</i> "
5:00 PM	Pamela L Bryant "The Magnitude of God"	Wayne K Dawson "A New Entropy Model for Biopolymer Folding: Yet Another Sign of the Divine Ingenuity in God's Creation"		Paul H Seely "An Answer to Whitcomb and Morris's <i>The Genesis Flood</i> "
5:30 PM	Dinner			
6:45 PM	Women in Science Gathering –FAC Room 114			
7:30 PM	Communications Meeting – Randy Isaac , presiding –Room 114	Career Progression for Christians in Science: Panel Discussion –Room 138	Test of FAITH: Introductory Resources on Science and Christianity – Ruth Bancewicz –Madden Theater (24)	
9:00 PM	InterVarsity Reception –hosted by Terry Morrison , FAC Room 138			

Monday, 1 August 2011				
7:30 AM	Breakfast			
8:30 AM	Devotions: Bob Fay , Madden Theater			
Parallel Session IV	IV-A. Seeking God's Wisdom: The Life of the Individual –Room 114 (20–21) Moderator: Dave Fisher	IV-B. Seeking Wisdom in Science (cont'd) –Room 138 (15–17) Moderator: Thomas Roose	IV-C. Symposium: Methodological Naturalism: Glorifying God through Science? –Madden Theater (10) Moderator: Robert Bishop	
9:00 AM	Edwin Yamauchi "Physicians in the Biblical World"		Joseph Spradley "Methodological Naturalism in Ancient and Medieval Science"	
9:30 AM	Joseph Lechner "His Father's World"	Jason Hine "The Fractal Nature of the Spiritual Journey—A Metaphor"	Robert C Bishop "God and Methodological Naturalism in the Scientific Revolution"	
10:00 AM	Bethany Sollere "The Burden of Proof: Harry Rimmer and the Legacy of Scientific Apologetics"	Michael Sleasman "Technology, Dispositional Values, and Virtue: Proposals for Addressing Emerging Technologies in Bioethics"	Ronald L Numbers "When God Disappeared from Science" Bruce L Gordon "In Defense of Methodological Neutrality"	
10:30 AM	Refreshment Break, Madden Lobby			
11:00 AM	William M Jordan "Christian, Engineer, and Entrepreneur: How Are They Related?"		Kathryn Applegate "Science Has Limits: Why Methodological Naturalism Is a Good Thing" Panel Discussion	
12:00 PM	Lunch			
2:00 PM	Check out closes			
2:00 PM	Yerkes Observatory field trip			

Abstracts

PLENARY SESSIONS

Friday, 29 July 2011

7:30 PM

Dinosaurs under the Microscope: A New Look at Old Dinosaurs

Mary Schweitzer

In the summer of 2003, after a 3-year effort, the remains of MOR 1125, an exceptionally well-preserved *Tyrannosaurus rex*, were finally brought in from the field. This dinosaur was already special, because its location at the very base of the Hell Creek formation made it the geologically oldest *Tyrannosaurus rex* ever found. Little did we know then just how special it really was!

This talk will chronicle the story of 1125, affectionately labeled “B-rex,” from the field to the headlines. It is the first dinosaur to show histological evidence for gender and reproduction (it’s a girl) and to show the presence of truly soft tissues preserved over geological time. This dinosaur and all we have learned from it have opened the possibility of understanding extinct organisms in deep time at a level we have previously thought impossible.

Saturday, 30 July 2011

8:30 AM

Stem Cells, Embryos and Ethics: A Continuing Controversy

William Hurlbut

After more than a decade of debate, discord, and political maneuvering, the controversy over embryonic stem cell research continues. President Obama’s executive order increasing the number of cell lines available for federal funding has been challenged in court and awaits final ruling; several cell lines approved under President Bush are no longer considered ethically procured; and though there has been encouraging progress with non-embryonic, alternative sources of pluripotent stem cells, technical challenges remain and there are renewed calls for “cloning” to produce

patient-specific cell lines for therapeutic use. Moreover, public frustration with the pace of progress with embryonic stem cells, and promising studies with adult stem cells (including fetal cells) have added troubling ethical issues of their own.

What is needed is a comprehensive policy, grounded in coherent moral principles and solid science, that will open a way forward with consensus – but, given the current political climate, we may instead be heading for continuing controversy.

Saturday, 30 July 2011

1:15 PM

Glorifying God in a Scientific Milieu: The Contrasting Domains of Neuroscience and Reproduction

Gareth Jones

Whenever one encounters Christian concerns about reproduction (including genetics) the emphasis is invariably placed on the assertion that this amounts to intrusion into divine territory. This is a realm in which humans should exercise great caution, because it represents a crucial stage in the formation of a newly constituted human being. Additionally, it places onerous control in the hands of human beings, whose proclivity is to destroy and deface rather than build up. On the other hand, there is generally far less theological concern about intrusions into another center of human existence, the brain. And yet, arguably, this may have far-reaching influence on an individual’s standing before God, both for good and ill. I shall argue that intrusions in both spheres represent significant control by human beings as those who image God, and that from a Christian perspective both represent potential means for glorifying God and serving humanity.

In both areas, what shines through as of crucial importance is that embryo, fetus, and adult are all viewed in their wholeness rather than as machines to be deconstructed. This immediately presents a challenge of major proportions to the scientific community,

since science’s power emanates from its ability to dissect and analyze the smallest of components in their isolation. A possible consequence in biomedicine is to lose sight of the individual in their integrity and cohesion, sometimes referred to as their “soulness.” By the same token, science can be employed to enhance the human condition: to overcome disease and debility, to improve the living conditions of individuals and communities, and even to change (improve?) aspects of human nature. The theological basis of these aspirations will be outlined, from which I shall conclude that we are called to live in hope rather than in fear, a hope based on the hope we have in Christ.

Saturday, 30 July 2011

8:00 PM

Climate Change: Why Are Science and Faith in Conflict?

Katharine Hayhoe

Our planet is currently warming at a rate unprecedented in human history. The vast majority of evidence suggests that heat-trapping gases produced by humans are the primary driver of these recent changes. Despite the extraordinary scientific consensus on this topic, however, 66% of evangelical Christians and 60% of all Protestant pastors disagree with this conclusion. What are the origins of this remarkable disconnect between traditional conservative Christian values and anti-environmental ideology? And – more importantly – what does science tell us about the consequences of persisting in this denial?

Sunday, 31 July 2011

10:30 AM

Challenges, Changes and Chances in the Natural Sciences

Dorothy F Chappell

The exciting world of science attracts, engages and energizes creative thinking for new eras of progress found in exploration of the frontiers of the natural world. Creativity and genius celebrated properly perpetuate the joy of discovery and invention. The stimu-

lating dynamics captured in scientific investigation create cycles of thought that profoundly mark each human generation with new technology, communication marvels, survival strategies, and literacy about intricacies known only to those who explore and test the natural world.

Ensuring the future of science in the United States after recent decades of decline and change in scientific literacy is essential to the future welfare of global communities. Investments in the culture of science from education to technological developments and pure scientific investigations of the natural world, among many other things, raise the visibility of science and increase the confidence of citizens to use science for the good of populations around the world.

The vitality of science as a respected and inviting career is influenced by economic, political and sociological factors and involves robust engagement by societies in the scientific enterprise. The joy of discovery should direct the promotion of science where legitimate career aspirations, inspiration of imagination and creativity are common experiences, and successful collaborations are developed. The frontiers of exploration elucidated by science should revolutionize education where informal and formal learning converge and open the portals of creativity and discovery. Science training should include advocacy and understanding of the challenges and changes in economics, politics and societies that influence scientific inquiry. Perpetual enlightenment of scientific engagement is tied directly to the provision for prosperity of scientific investigation.

Sunday, 31 July 2011 1:30 PM

One Example of Science-Faith Synergy: How We Can Glorify God and Serve Humanity by Caring for the Earth
Steven Bouma-Prediger

Regardless of what people think about various ecological degradations, e.g., global climate change, the Bible affirms that we humans are called to serve and protect the earth. But what exactly does that mean? How should we serve and what should we protect?

It takes more than good intentions to fulfill the biblical call to be earthkeepers. It takes, among other things, sound scientific knowledge of entropy and energy flow, niches and the nitrogen cycle, keystone species and plant succession. Christian earthkeepers, in other words, need basic knowledge about how the world works and the interconnectedness of all creatures great and small. Caring for the earth is one important example of science-faith synergy – of science enhancing the witness of faith and faith motivating science to seek shalom.

**Symposium:
GLOBAL MEAT CONSUMPTION:
HEALTH, ENVIRONMENTAL AND
ETHICAL CONCERNS**

Saturday, 30 July 2011 10:00 AM

How Does What We Eat Create Chronic Disease?
Martin M Root

In this presentation, I will discuss how components of the current typical Western diet contribute to the onset of the common chronic diseases, the cardiovascular diseases, diabetes, and the cancers. Starting from a diet that confers low risk to these diseases, we will see how adding common ingredients of the Western, and especially American, diet increases risk. The possible mechanisms of these risks will be discussed.

While still under criticism and review, the newest Dietary Guidelines for Americans 2010 is a reasonable starting point. Some of the best evidence for the efficacy of this diet comes from international studies in countries where the chronic diseases so common in our country are much less common. In addition, we find that foods and not nutrients in pills seem to work best. And while genomics may hold answers in the decades to come, simple public health messages such as lower salt and trans fat and sugar can save lives here and now.

One of the most surprising lessons to come out of research on diet and chronic disease in the last 20 years is the convergence on a single dietary message for two very different disease families, the cardiovascular diseases and the cancers. We will explore how

a single set of dietary recommendations, less meat and more fruits and vegetables and more exercise, affects the different pathways that lead to these two families of diseases.

Saturday, 30 July 2011 10:30 AM

Environmental and Ethical Implications of Meat Consumption
Steven G Hall

Americans eat more meat than they did a century ago. They also eat more animal products than do citizens of many less-affluent countries. This diet has health implications such as increased rates of obesity, cardiovascular diseases, and cancer. However, the implications for the environment are also significant. For example, scientific studies suggest that beef raised in confined animal feeding operations (CAFOs) may require 20–40 times (4000%) more resources than the grains fed (e.g., corn, soy) cattle. In this case, these grains could potentially be eaten by humans.

Other animals may be better converters (chicken and some fish may bring the ratio down below 300%), but all will experience some loss of energy and higher costs in terms of resources (energy, water, land) when comparing animals to the plants they consume. This is further exaggerated for carnivores such as salmonid fish species.

A related issue is that animals confined in CAFOs may be exposed to higher levels of pathogens and wastes, resulting in lower quality of life for consumers, as well as the need for higher use of antibiotics and other interventions. Compassionate and conservative people should consider eating less meat, not only for the health benefits but also for environmental and ethical reasons.

Saturday, 30 July 2011 11:00 AM

Animal Rights or Responsible Stewardship?
Jerry L Risser

As societies transition toward greater urbanization, the agrarian connections to the animals that serve as human food have become distant memories. This has shifted the way we view

livestock dramatically. In one sense, it has created a paradigm of human relationships to animals that identifies more with pets than farm animals, and leads inexorably toward notions of animal rights and liberation. Yet, in another sense, the detachment has corresponded with the development of vast intensive livestock operations, so-called “factory farms,” that create, among other issues, great concerns about the welfare of the animals in such facilities that often go unrecognized by the consumer. Both should concern Christians.

The extension of the concept of rights to animals threatens the primacy of human dignity, particularly in the so-called “marginal cases” where human sentience is in doubt. Yet the way we treat livestock that will ultimately be our food also reflects upon our humanity, and particularly in the way in which we approach the creation over which God has granted us dominion.

This presentation will seek to define the salient issues of contemporary food-animal welfare. It will further describe the predominant philosophical and theological arguments in favor of animal rights, with responses, both secular and Christian, that rebut these positions. It will engage a view grounded in the responsible stewardship tenets of the dominion mandate of Scripture, granting a distinct moral status for animals but maintaining the “bright line” of separation ontologically from human beings. It will propose an animal ethic consistent with this view, including its practical implications.

Saturday, 30 July 2011 11:30 AM

**Food as a Moral Object:
The Ethics of Eating**

James Thobaben

Eating is a moral act that usually is casually performed with little ethical consideration in late modern western society. Even Christians—at this time, in this society—people who are supposed to offer up their bodies as “living sacrifices,” rarely consider the morality of food as the source of the very elemental blocks that make up the physical body that is supposed to be offered to God. This has certainly not

always been the case—as Jesus speaking on Levitical purity (Mark 7:18–19), the Last Supper, the admonition of Paul in Rom. 14:21, severe restriction by ascetic hermits, behavioral standards in many monastic communities, seasonal fasting in the Catholic and Orthodox traditions, and more recently, community expectations among early Puritans and then those in the Wesleyan-Holiness movement indicate.

Christians are now being asked (and are asking themselves), “Has this aspect of human physicality been inappropriately ignored as a moral concern?” Questions are raised by those associated with the so-called Green Movement, but also by Christians in the Global South who wonder not if those in the West should be deprived but if believers in that portion of the world in which the faith is rapidly growing should be supported by other believers (2 Corinthians 8).

In this presentation, the history of Christian “moral eating” is briefly explored, and consideration is given to whether “eating” should assume greater prominence in the community discourse of Christians as a behavior requiring ethical accountability—as a matter of personal purity, justice among humans and toward the earth, and mercy for other believers.

Symposium:

**PROBING THE PAST:
CONTRIBUTIONS FROM
PALEONTOLOGY AND
ARCHAEOLOGY**

Saturday, 30 July 2011 10:30 AM

**The Study of Paleontology
and the Creation Mandate**

Keith B Miller

As God’s image bearers we are called to exercise servant lordship over a diverse and dynamic biosphere. Our growing understanding of the history of that creation must be brought to bear on our stewardship mandate. The distribution and interrelationships of species in modern ecosystems is a result of the evolutionary response of organisms to their dynamically changing environments. The current biosphere is a consequence of its history. That evolutionary history

is recorded in the fossil record, and interpreted through the science of paleontology.

Paleontology gives us a window into the changing life and ecosystems of the past. This history is otherwise only known by God, who has given us the tools to have a glimpse into his past creative work. The ability to see the past, as well as to anticipate the future, places us in a unique position within God’s creation. We become witnesses of God’s work over time, and participants in God’s continued creative activity in the present. We are agents of change in the natural world, and knowing its past has important implications for how we exercise our power as God’s image bearers today.

Another important consequence of our ability to bring ancient organisms to life is that we can participate with God in looking at all that has been made and declaring it good. Every new discovery of the past creation is an opportunity to worship God and bear witness to God’s goodness, power and glory.

Saturday, 30 July 2011 10:00 AM

**Radiocarbon Methods of Dating
Materials for Biblical Archaeology
and Earthquakes in the
Dead Sea Area**
Ken Wolgemuth

Radiocarbon (C-14) is a trace isotope of carbon that is formed in the upper atmosphere by cosmic rays bombarding nitrogen atoms, and then is incorporated into carbon dioxide that is taken into the biosphere. How the decay of C-14 with its half-life of 5,730 years can be applied as a dating method to wood, charcoal, bones, coral reefs, and other recent carbon-bearing material will be described.

Because cosmic ray bombardment from the sun varies with time, radiocarbon ages calculated from the measured values in old samples must be calibrated against calendar years derived from tree rings, sedimentary varves, coral growth, and other radioactive isotopes (Uranium and Thorium). Radiocarbon dating is applicable to 45,000–50,000 years with greater uncertainty as C-14 decays to

less than 2–5% of modern carbon in the atmosphere.

Radiocarbon dating and varve-counting of lake sediments along the Dead Sea fault and plate boundary have been investigated in the light of the earthquakes mentioned in the Bible. Examples shown will illustrate the usefulness of this dating method applied to events recorded in the Bible, and counteract objections by young-earth advocacy organizations.

Saturday, 30 July 2011 11:00 AM

Physical Geography of the Eastern Nile Delta during the Bronze Age: Implications for the Location of the Red/Reed Sea
Stephen O Moshier

Surface geology was surveyed in a portion of the northwest Sinai, Egypt, coinciding with excavations at Tell el-Borg from 2000 to 2007 under the direction of James K. Hoffmeier, Trinity International University. Excavations at Tell el-Borg and adjacent Tell Hebua have confirmed New Kingdom temple inscriptions and murals that depict the region as the starting point of the ancient “Ways of Horus,” the militarized coastal road between Egypt and the land of the Philistines (modern Israel and Palestine).

Historical satellite imagery (including declassified photos from cold-war-era spy programs) reveals surface features that were obscured in recent years by urbanization and agricultural projects. At the same time, an extensive open canal system for the Al-Salam agricultural project reveals subsurface deposits representing ancient environments that existed in the region during the Bronze Age, when the region was under the influence of the now defunct branch of the Pelusiac Nile.

Coordinating the geological survey and satellite imagery with GPS/GIS technology resulted in a paleogeographic map of the study area for the Bronze Age. The map reveals different positions of the Mediterranean coastline with associated lagoons and the existence of Pelusiac Nile distributaries and wetlands. The existence of “extinct” inland bodies of water in the

area, along with correlations between the ancient names of excavations sites and place names in Exod. 14:1–4, provides some compelling candidates for the location of the Red/Reed Sea. Alternative Red/Reed Sea sites based upon geological reasoning will be evaluated, as well.

Saturday, 30 July 2011 11:30 AM

The Location of the Red/Reed Sea in the Light of Recent Archaeological Work in Egypt
James K Hoffmeier

Since the 19th century, Egyptologists and explorers have been interested in tracing the route of the exodus and the location of the Red/Reed Sea of the Exodus narratives. These investigations have resulted in different reconstructions, which, in turn, have been presented in Bible atlases over the decades.

During the occupation of Sinai from 1967 to 1982, Israeli geologists and archaeologists conducted surveys and excavations that resulted in some new theories about the route of the exodus and the location of the Red/Reed Sea. The return of Sinai to Egyptian sovereignty ushered in a new era of research in Sinai. Some important discoveries have been made, one of the most important of which was the uncovering of Tjaru (Sile), Egypt’s fortified frontier town.

Beginning in 1994 and ending in 2008, I directed archaeological surveys around and excavations at Tell el-Borg (N. Sinai), along with geological and paleo-environmental fieldwork under Stephen Moshier (Wheaton College). This paper will present new evidence to suggest that Yam Suf of the Bible be equated with the Ballah Lake(s) on the eastern frontier between Egypt and Sinai.

Symposium:

THE ETHICS OF NEUROSCIENCE AND REPRODUCTION

Saturday, 30 July 2011

2:30 PM

“Reorientation” Therapies and Same-Sex Desire: Are they Effective and Ethical?

Heather Looy

“Reorientation” or “reparative” therapies intended to help people shift from homosexual toward heterosexual desires and behaviors are highly controversial. Opponents argue they (a) don’t work, (b) attempt to treat something that is not inherently harmful, and (c) have potentially serious harmful effects. Proponents claim that such therapies must be an option for those who experience profound conflict between their sexual desires and their conscience or values, and that evidence of flexibility in sexual orientation suggests that some individuals with same sex attractions can experience genuine change.

I briefly review (a) the history and current consensus and controversy regarding sexual orientation and change therapies, (b) the scientific evidence for the stability of sexual orientation and the possibility of psychotherapy as a means to alter sexual desire, and (c) the moral assumptions and ethical implications of various positions on this topic.

Saturday, 30 July 2011

3:00 PM

The Reproductive Brain: Neurosexism and the Ethics of Sexuality
William M Struthers

Over the past 20 years, there has been a renewed interest in the differences between men and women. Of interest are recent brain imaging studies which examine the neurological differences between men and women in how they process sensory information, perform cognitive tasks, and respond emotionally. The rise of this emphasis on male and female brain differences extends into a variety of domains and can be understood as a form of what is called “neurosexism.” Neurosexism is the idea that neuroscience research supports sexist attitudes. A more recent manifestation of the classic

nature/nurture debate within psychology, neurosexism provides a contemporary example of how scientific research is used in the ethical arena. When these dissimilarities between men and women are attributed to brain function, it can become a slippery slope with respect to sexual ethics.

In this presentation, a model of sexuality which extends from the genetic to the spiritual and sociological will be presented. A review of the scientific literature on gender and sex differences will be provided and an emphasis on the reproductive aspects of the brain (those that are involved in sexual orientation and intimacy) will be covered. The model presented will attempt to provide a way to address gender differences in psychological phenomena such as cognition, behavior, and affect, that respects the common and distinct aspects of human sexuality as seen through a Christian theological lens.

Saturday, 30 July 2011 3:30 PM

Epigenetic Mechanisms in Human Reproduction and Disease: An Ethical Analysis

Brian T Greuel

Epigenetics is the study of heritable alterations in gene expression not coded in the actual DNA sequence of any gene(s), but arising from modifications to DNA and chromatin structure. In particular, abnormal changes in the methylation state of DNA or in the modification of associated histone proteins may have profound impacts on embryo and trophoblast development and lead to the development of phenotypes or disease states that extend to future generations. Nutritional factors, exercise, stress levels, and exposure to environmental toxins have all been associated with heritable, epigenetic changes in gene expression. Assisted reproduction technologies may also lead to an increase in disorders resulting from epigenetic alterations to developing gametes and early embryos. The ethical implications of lifestyle choices and technological practices that impact human reproduction and disease through their effects on epigenetic mechanisms will be considered in this presentation.

Symposium:

METHODOLOGICAL NATURALISM: GLORIFYING GOD THROUGH SCIENCE?

Monday, 1 August 2011 9:00 AM

Methodological Naturalism in Ancient and Medieval Science

Joseph Spradley

Some of the most important ideas of the scientific revolution in the seventeenth century emerged in the early centuries of the Christian church. These concepts made it possible for modern science to transcend its ancient Greek heritage, which was limited by its dichotomy between the heavens and the earth, deification of the heavens, and lack of empirical emphasis. Early Christian contributions include ideas related to inertia, gravity, the physical nature of the heavens, and the importance of empirical evidence, all of which exhibited a new methodological naturalism that influenced Galileo and others in the scientific revolution. Particular emphasis will be placed on the work of John Philoponus in the sixth century and Hildegard of Bingen in the twelfth century, who were arguably the first Christian male and female scientists.

Monday, 1 August 2011 9:20 AM

God and Methodological Naturalism in the Scientific Revolution

Robert C Bishop

As a practice, what we now call "methodological naturalism" was identified with the new experimental philosophy of such leading lights of the Scientific Revolution as Boyle and Newton. They had serious theological reasons for their methodological approaches to studying creation. Ultimately, their goal was not simply to understand how creation worked but to glorify God and demonstrate his wisdom.

Monday, 1 August 2011 9:40 AM

When God Disappeared from Science

Ronald L Numbers

Starting with Buffon (1707-1788), I will describe how God was removed from science by the end of the 19th century.

Monday, 1 August 2011 10:00 AM

In Defense of Methodological Neutrality

Bruce L Gordon

I argue that, while much current lip-service is paid to methodological naturalism, it did not operate as a rigid constraint on rigorous scientific theorization in the past, and it is not, in fact, a constraint much evident in the technical apparatus of modern physical theory. Using examples from physics and biology, I argue that science is best served by methodologically neutral assumptions, not criteria that favor naturalistic presumption over its denial.

Monday, 1 August 2011 11:00 AM

Science Has Limits: Why Methodological Naturalism Is a Good Thing

Kathryn Applegate

Methodological naturalism, the scientific practice of limiting the explanation of natural phenomena to only natural mechanisms, is a wise and powerful means of investigating the created order. This limitation is not a defect in science but rather a spur toward thorough examination of the phenomenon in question. For the scientist who is a Christian, a commitment to God's providential upholding of all things allows free exploration of the world with full confidence that whatever process one studies, from the birth of stars to the inner workings of cells, one is never in danger of explaining away God's activity in the world.

SEEKING GOD'S WISDOM FOR
SCIENCE TEACHING

Saturday, 30 July 2011

10:00 AM

**Teaching Science and Religion:
Some Mid-Career Reflections and
Suggestions**

Denis O Lamoureux

The relationship between science and religion continues to be a struggle for evangelical students. On Sunday mornings, they hear of the historicity of Adam and Eve and Noah's Flood, but during the week at university, they are faced with the scientific facts that humans evolved and that there never was a global flood. Consequently, most of the evangelical students entering my class have their faith and science in separate compartments. Yet, intuitively they know such an approach is misguided.

Employing a constructivist pedagogy, I introduce a variety of classic models on the relationship between science and religion (Ian Barbour, John Haught, and John Polkinghorne). But the most important aspect of the course is to challenge their assumption of concordism—the belief that the Bible aligns with modern science. These principles are presented slowly and respectfully in nearly every class, since they challenge years of home school, Christian school, and Sunday school indoctrination. In addition, students are introduced to a biblical understanding of intelligent design (*contra* so-called “intelligent design theory”), freeing them from the false dichotomy of design vs. evolution. Finally, primary readings of Galileo's hermeneutics (“Letter to Christina,” 1615) and Darwin's religious beliefs (*Autobiography*, 1876), coupled with a critique of the naïve positivism of Richard Dawkins, lead nearly every evangelical student toward a healthy and complementary relationship between modern science and their faith in only thirteen weeks.

Audio/slide lectures of the first six hours of the course with the class notes and class handouts are available online at www.ualberta.ca/~dlamoure/chrtc_350_1st_six_hours.htm

Saturday, 30 July 2011

10:30 AM

**Beyond Two Books: Metaphors for
the Relationship between Science
and Religion in the 21st Century**

Keenan E Dungey

Even before the dawn of modern science, Christians have used the “Two Books” metaphor to describe the relationship between knowledge of the world and knowledge of God. Since God, the Author of all truth, wrote both books, then our science should be in harmony with our religion. Peter M. J. Hess has reviewed the history of this metaphor and the decline in its popularity. Additional metaphors have been used in western culture, including the warfare hypothesis, Gould's “non-overlapping magisteria,” and the use of a bridge, to illustrate possible dialog between science and religion (The Center for Theology and the Natural Sciences).

For three years, undergraduates at the University of Illinois Springfield have studied the relationships between science and religion and have proposed their own metaphors to illustrate these relationships. In this presentation, I will describe these metaphors, categorize them according to Barbour's typology for relating science and religion, and discuss their advantages and disadvantages. By widening the list of possible metaphors, I hope to provide opportunities for our culture to explore new ways to relate science and religion.

Saturday, 30 July 2011

11:00 AM

**Defeating the Teaching of
Creationism in the Public School
Science Classroom**

John Staver

Writing in the January 28, 2011 issue of *Science*, Berkman and Plutzer assert that, while science consistently defeats creationism in the courtroom, science is losing to creationism in the classroom (pp. 404–5). Schwab (*School Review* 81, 1973) explains why: “Scholars, as such, are incompetent to translate scholarly material into curriculum” (p. 501). Schwab's bold assertion, set forth almost 40 years ago, not only remains valid today, but also extends to teaching and to communicating with the public at large.

Schwab maintained that four additional domains of expertise beyond subject matter expertise are required: Teachers-teaching; learners-learning, the context-setting for teaching and learning, and curriculum development as a process. Moreover, the representatives of these domains of expertise must work collaboratively to succeed. If advocates of evolution are to defeat creationism in the classroom and win the support of the citizenry, then they must accept Schwab's assertion and my generalization of it.

My strategy for success centers on utilizing research-based knowledge from science, theology, and the four additional domains of expertise and research-based strategies for interacting with learners of all ages and faiths who exhibit sympathy toward, quietly support, or openly argue for including some form of creationism (e.g., intelligent design) in the public school science curriculum. Examples of such knowledge are (1) authority and limits of Holy Scripture; (2) setting reasonable versus unreasonable goals; (3) influence of learners' prior knowledge; (4) teaching problem-solving; (5) learning via scaffolded, guided inquiry; and (6) change theory.

Saturday, 30 July 2011

11:30 AM

**The Role of Faith Structures in
Mediating Christian University
Biology-Related Majors'
Reconciliation of Evolution and
Personal Religious Beliefs**

Mark Winslow

The goal of this study was to explore how Christian biology-related majors at a Christian university reconcile their perceived conflicts between evolution and religious beliefs, and how their faith, as a structural-developmental system for ordering and making meaning of the world, plays a role in the mediating process. This naturalistic study utilized a case study design of 15 participants specified as undergraduate biology-related majors or recent biology-related graduates from a midwestern Christian university who had completed an upper-level course on evolution.

Data were collected through semi-structured interviews that investigated participants' faith structures and their

views on creationism and evolution. Fowler's theory of faith development and Parks' model of college students' faith systems were used extensively. Data analysis revealed patterns that were organized into themes and sub-themes, which were the major outcomes of the study. Most participants were raised to believe in creationism, but came to accept evolution through an extended process of evaluating the scientific evidence in support of evolution, negotiating the literalness of Genesis, recognizing evolution as a nonsalvation issue, and observing professors as role models of Christians who accept evolution.

Participants' faith structures, which played an important role in participants' reconciliatory process, are the focus of this paper. The rich description of this study lends heuristic and novel insights to educators seeking an understanding of the complex processes by which Christian biology-related majors approach learning about evolution and seek reconciliation between their understanding of evolution and their personal religious beliefs.

Saturday, 30 July 2011 2:30 PM

**Chemistry as a Source of Wisdom:
The Chemistry Curriculum as a Tool
for Exploring Faith-Science Dialogue**
Stephen M Contakes

This paper presents a scheme for systematically exploring science-faith-technology-ethics-dialogue in a chemistry curriculum. Central to this strategy is the first-semester general chemistry course, which may be used to equip students with the foundational philosophical and theological tools needed to meaningfully relate their faith to contemporary science. The reason is that chemistry's central theoretical paradigm, atomic-molecular theory, is noncontroversial, has a rich historical relationship with Christian theology, and lends itself to discussion of the nature of science and the relationship between natural and revealed theology. With this grounding, students are prepared to further explore issues such as radioisotope dating and the age of the earth, the anthropic principle, chemistry-based natural theologies, biomolecular

sequences and evolution, scientific atheism, Christian environmentalism, and technological ethics in upper-division chemistry courses.

Historical case studies spread throughout the curriculum are used to further develop selected faith-science topics and to illustrate how select Christian chemists' faith impacted the research they pursued and their scientific practices. Formal lab-based discussions provide opportunities to help students practice ethically responsible science and reflect on how scientific practice influences spiritual formation.

A capstone course reviews, systematizes, and integrates students' understanding of contemporary faith-science scholarship and explores ethical, pastoral, and sociological issues associated with the widespread use of chemical technologies including chemical weapons, "the pill," psychoactive drugs, chemically intensive agriculture, plastics, fossil fuels, dual-use chemicals, and biotechnology.

Saturday, 30 July 2011 3:00 PM

**Christian Faculty at Christian
Colleges and Universities:
Sine Qua Non?**
Bryce Sullivan

This paper addresses some of the theoretical and practical considerations related to hiring Christian faculty for Christian universities. In an effort to determine the faculty hiring practices and procedures at Christian colleges and universities in the United States, deans or chief academic officers selected from institutional members of the Lilly Network of Church-Related Colleges and Universities (Lilly) or from the Council for Christian Colleges and Universities (CCCU) were surveyed by email.

Out of a total of 180 institutions surveyed, responses were received from 51 institutions for an institutional response rate of 28.3%. There were 26 unique responses from Lilly Network institutions, 28 from CCCU institutions, and 3 responses from institutions belonging both to CCCU and Lilly.

The benefits and challenges associated with the Christian hiring policies were varied. Some respondents reported difficulties locating enough qualified

Christian candidates, and others reported no difficulties in this regard. Some schools that did not require the hiring of Christians stated that their Christian mission and culture did not suffer. Other respondents thought that hiring Christian faculty was the sine qua non of being a Christian university. These and other issues will be discussed in the paper.

Saturday, 30 July 2011 4:00 PM

**Challenges in Establishing an
ASA Homeschool Science
Resources Website**
Douglas Hayworth

Establishing a high-quality website to advise Christian homeschool teachers (parents) about science is a critically important fulfillment of our ASA mission. We are uniquely qualified and positioned to inform and advise parents about the scientific content and Christian perspectives presented to them in available homeschooling curricula. In addition, we own or have access to a large repository of information that could be made available to supplement homeschool learning.

I volunteered to lead the ASA Homeschool Science Resources project two years ago and worked mostly on my own for the first year to develop and design the website. The project was officially approved by the ASA council in March 2010 and an anonymous donor provided funding.

The project is moving forward, but the progress has been slow as we continue to work through a variety of philosophical, pedagogical, content-design, logistical, and practical issues. I will discuss these issues (and hopefully obtain useful feedback about them) by addressing the following types of questions: Against what science standards do we measure when reviewing textbooks? What subject-topic classification is best? What format is best for writing and presenting reviews and resources? How do we design an easy-to-navigate and searchable website on a limited budget? How do I enlist volunteers and effectively communicate with them to delegate tasks? How do we negotiate with curriculum publishers to provide textbooks for review? Ultimately, how can we recruit qualified ASA members

to examine and write informative, detailed reviews of textbooks?

Saturday, 30 July 2011

4:30 PM

Role of PUST for North Korean Agricultural Development and Food Security through Life Science Research

Pilju Kim Joo and Joshua J Song

The Pyongyang University of Science and Technology (PUST) is the first international research and educational institution to operate in North Korea. The university's goal is to be a world-class higher education institution that will train generations of North Korean students — who have been shielded from many international influences — in the technical skills and knowledge required to make positive contributions to a global community. PUST will be unique with its international faculty, all-English instruction, and having faculty members financially supported by external sources.

Over the next five years, PUST plans to recruit approximately 250 Christian faculty members from prestigious universities and research institutions in the United States and elsewhere in order to expose PUST students to the best thinking in the educational world. These faculty members will lead in the classroom and in research laboratories as permanent faculty members, adjunct faculty members, or special lecturers who rotate in and out of campus on a carefully planned basis.

Volunteers may teach in one of three academic departments: the School of Electrical and Computer Engineering, the School of International Finance and Management, or the School of Agriculture and Life Sciences. In the future, three more departments will be added: the School for Architecture, Engineering, and Construction (AEC), the School for Public Health and Environmental Sciences (PHES), and the Industrial Cluster, which will allow international corporations to train PUST students.

To apply for a faculty position or to request additional information, please email yustpust@gmail.com or HR.pust@gmail.com.

Saturday, 30 July 2011

5:00 PM

Researching Science and Religion: Thoughts about Engaging in the Classroom

Bryan Clarke

My study researches student engagement with issues related to the interaction between science and religion. The researcher's background in teaching both science classes and religion classes and as a chaplain became part of the context for researching student tension between science and religion at the university.

The genesis of this research specifically unfolded with questions in the researcher's own classroom practice and university experiences as he watched students grapple with questions about creation and evolution. From these questions and this context, the connection was made between the questions students were raising to educational hermeneutic frameworks that might affect student typological frameworks.

As this research progressed, it developed into a quest to understand how science and religion typologies could be utilized in survey form as a tool to increase student understanding and classroom discussion. Thus, the purpose of the research project centered upon the creation of a workable survey instrument to help students and teachers better understand the interactions between issues of science and religion.

This survey was applied to students taking science and religion course CHRTC 350 at the University of Alberta, and their responses reveal a fascinating process of grappling with their own frameworks of understanding and some shifts in their thinking. The result of this research opens avenues to explore the relationship of educational pedagogy to the science and religion classroom, deflating an often binary approach that upholds the false dichotomy of science or religion.

ENVIRONMENTAL STEWARDSHIP

Saturday, 30 July 2011

10:00 AM

Replacing "Human Exceptionalism" with an Integrated Environmental Ethic

Peter M J Hess

Earth's biosphere is poised on the brink of the sixth mass extinction event during the past 450 million years, this one of human making. Although the factors underlying our looming ecological crises are diverse, one in particular stands at the root: the doctrine of "human exceptionalism." Born of an antiquated notion of the Abrahamic traditions that humans were created to rule over the earth, human exceptionalism has undergirded the philosophy that *Homo sapiens* — alone of all species — is exempt from biological constraints. This attitude leads to the inevitable failure of our ecological stewardship, and may very well prove fatal to our species and to our planet mates.

Can we unearth the roots of an alternative theological story that integrates *Homo sapiens* more fully into creation? Starting from the Pauline conviction that "all creation is groaning together" (Rom. 8:22), I will look at poetic and theological resources within the Roman Catholic tradition that challenge human exceptionalism. I will compare some insights of Gerard Manley Hopkins, Alice Meynell, and Karl Rahner on the relationship between God, humanity, and evolving creation.

In the words of Karl Rahner, SJ, "The point at which God in a final self-communication irrevocably and definitively lays hold on the totality of the reality created by him is characterized not as spirit but as flesh. It is this which authorizes the Christian to integrate the history of salvation into the history of the cosmos" (*Hominization* [1958], 55). Creation is the domain of God's redemptive work, capable of bearing the Incarnation and, in turn, of being transfigured by it. Integrating humanity into the evolutionary creation story is essential to articulating a coherent environmental ethic.

Saturday, 30 July 2011

10:30 AM

All Data Are Equal, but Some Are More Equal Than Others

Thomas L Walters

All academic disciplines and individual academicians adopt mechanisms for arriving at conclusions by gathering data and analyzing that data.

This paper argues that the differences among academic disciplines in the way conclusions are reached has little to do with analytical processes and almost everything to do with the processes for determining and selecting data.

Within specific academic disciplines, individuals may vary in their approach to collecting and viewing data, which will affect their conclusions. We will consider how the mindset of the investigators may affect their conclusions, depending on whether they are a realist, idealist, or instrumentalist.

This paper will address the selected topic of environmental stewardship, and of how seeking the truth about the environment with a mindset of preserving God's creation may affect the data gathering and conclusions of research.

The paper will also address "Seeking Wisdom through Scientific Endeavors" – through the relevance of data collection and mindset to individual success toward approaching wisdom.

Saturday, 30 July 2011

11:00 AM

Earth Day: Origin and Development

John Munday

Earth Day began in the mind of founder John McConnell, son of a Pentecostal evangelist, in the late 1960s. He aimed to promote global peace and justice by forging agreement around a global holiday devoted to "Earth care." By the winter of 1969, he had an agreement from the City of San Francisco and supporters in other cities to hold the first Earth Day on March 21, 1970. This date was chosen to coincide with the spring equinox, making Earth Day a global geophysical holiday which all people could celebrate independent of national, political, and creedal differences.

Another movement originated by Senator Gaylord Nelson planned

an "environmental teach-in" set for April 22, 1970. Its name was changed in the planning stage to Earth Day; subsequently, Nelson claimed to be the founder of Earth Day. The result ever since has been confusion and political tension about which day is Earth Day.

Today, more than 40 years later, Earth Day is celebrated on both days by different groups of people. An annual ceremony takes place at the United Nations Peace Bell in New York on the spring equinox, and at other cities around the world. The other more popular day in April is well established in the environmental culture with many celebrations and activities. These and other details about Earth Day's origin and development will be explored, with reference to extensive personal communications with McConnell, books about both McConnell and Nelson, and to other materials in environmental archives.

Saturday, 30 July 2011

2:30 PM

How to Engage Evangelicals in Conservation: The Implementation of Creation Care in Peru

Oscar E Gonzalez

The environmental crisis in which we are living demands that it is necessary to take action. Scientists and technicians may understand well the urgency of a response to conserve nature, but civil society has to participate. The current approach to society with technical reasons is not enough to convince people that everybody has to conserve the Earth. An environmental ethic is needed. Religion can be a good source for environmental ethics and Christianity has the doctrine of creation care that can be used for a calling to action.

I explain the applicability of creation care doctrine among the evangelical Christians in a third-world country, Peru. This is a country that has a huge biodiversity, but also huge environmental problems and with a rising population of evangelicals. Even though Peru has a population of more than 80% Roman Catholic, evangelicals have a stronger sense of community and ties with the local church. There are several rural communities close to important conservation areas that

have an important population of evangelicals.

There are alternatives and opposition to creation care which I will address and comment on, providing a defense and justification of this doctrine in this context. Finally, I will give examples of positive outcomes of the applicability of creation care, such as churches working together with conservationists for the sake of nature and the glory of God.

Saturday, 30 July 2011

3:00 PM

Conservation and Christ: Insights for Participating in the Redemption of the Whole World

David W Hoferer

A challenge in conservation biology is to reconnect fragmented habitats so that individual members of all species living in those areas may move from one area to the next. This can connect nesting sites with feeding sites, provide for the expansion of small populations, and also provide for gene flow between populations that were disconnected due to human activity. While all of these reasons for reconnecting habitats are important, what is often overlooked is the importance of healthy habitats for people. Investing our time, money, and energy into the conservation of a turtle or insect species, for example, is seen to compete with the ethical demands for the elimination of poverty, the education of children, and the mission of connecting people with Christ for salvation from sin. However, the emerging field of ecopsychology has offered new insights into our interconnectedness with the rest of nature.

Experiences with nature reduce stress in people, allow for faster recovery times from stressful situations, increase attention and focus, and have been found to be important in the psychological development of children. Mentally, humans respond positively to experiences with nature. Far from taking needed efforts away from improving people's lives, then, the efforts of conservation biologists provide for the restoration of natural and human communities. This is consistent with an understanding of the work of Christ from Colossians, in which we are told not only that all

things came into existence through Christ, but also that those same things are redeemed by Christ.

Reconnecting fragmented habitats is about reconnecting human beings with the whole of their environments and with the Christ who reconciles all to the Father. The dualism of believing that human needs are separate from the needs of natural communities can be overcome by understanding that humans need healthy habitats that are reflective of the redemptive work of Christ for the whole world.

Saturday, 30 July 2011 4:00 PM

**Caring for Creation at
Concordia University Wisconsin:
Bluff Restoration and the
Concordia Center for
Environmental Stewardship
Don W Korte Jr and Mary H Korte**

A basic Christian understanding of biblical environmental stewardship, coupled with a Lutheran interpretation of vocation, has guided Concordia University Wisconsin's efforts to protect creation as part of her mission of "helping students develop in mind, body, and spirit for service to Christ in the Church and in the World."

In Phase I of her Renewed by the Waters campaign, Concordia completed a \$10 million bluff stabilization project, created access to the Lake Michigan beach, constructed an amphitheater on the bluff's top, planted native prairies, and created perched wetlands and offshore freshwater communities as part of the environmental restoration effort.

In Phase II, the new \$4.2 million LEED-certified Concordia Center for Environmental Stewardship (CCES) opened in summer 2010. The CCES includes laboratories, classrooms, and lecture halls which were built to emphasize sustainability. This project is not only protecting a unique part of God's creation but is also providing distinctive educational opportunities to share our Christian beliefs regarding our responsibility as stewards of God's creation with Concordia students, area schools, and the community.

Concordia's bluff stabilization project won the American Society of Civil

Engineers (ASCE) Outstanding Civil Engineering Award of Merit in 2010 and was one of five finalists for the International Award the same year. This presentation highlights Concordia's unique campus project in creation care and sustainability.

Saturday, 30 July 2011 4:30 PM

**Science and God's
Earth-Protect Mandate
Ray Williams**

Almost universally it is recognized that Genesis 1 conveys a mandate from God for humankind to function as royal representatives, having dominion over creation with the inherent responsibility to protect the earth. This scriptural command is not a metaphoric or allegorical message; instead, it is a direct instruction for humankind to act as responsible stewards of the earth's environs. Significantly, the mandate is imbedded in a narrative that describes the transformation of the earth and the creation of humankind in the "image of God."

Over the millennia, scientific discoveries have verified the harmony that exists between the biblical creation account and the physical world. Unfortunately, the interpretation of Genesis 1 is still an unsettled issue and confusion abounds concerning the so-called creation days.

Organizationally, the author of Genesis divides the earth's transformation, and its filling with life forms, into eight "And God said" episodes. The analysis of Genesis 1 presented herein explains the "episode" versus "day" relationship by analyzing the account's literary structure, the use of the Hebrew word *yom*, and the context of the "evening and morning" refrain.

This fresh viewpoint adopts a literal interpretation of the text and one that harmonizes with the conclusions of modern science. Also, it recognizes that the author used a dual-pattern literary device to describe, in eight episodes, the earth's transformation while a sequence of "days" was inserted, as a refrain, to prescribe a living pattern for humankind. This Dual-Pattern interpretation enables the full impact of the Earth-Protect mandate to be realized.

SEEKING WISDOM IN SCIENCE

Saturday, 30 July 2011 2:30 PM

**Does the Success of Science by
Itself Provide Strong Support
for Naturalism?**

Peter Payne

The success of science suggests that in the normal order of nature, everything can be explained according to the laws of physics. Does this provide strong support for naturalism? This paper will give a philosophical critique of the claim that it does. (1) A gapless normal order of nature accords well with the Christian conception of God. (2) This does not imply a gapless history, i.e., it does not imply that God never does miracles. (3) Strong support for a thesis, e.g., naturalism, requires that there are no alternative explanations that accord well with the evidence in question, and that it has some prior plausibility. Christian theism meets the first condition. The latter goes beyond this paper, but it will touch upon several arguments that purport to show that a Christian thesis lacks prior plausibility.

Saturday, 30 July 2011 3:00 PM

**Metaphysical Considerations
Enhance Reverse
Engineering Studies
Dominic Halsmer**

With recent successes in the application of reverse engineering techniques to natural systems, this approach is being adopted on a more widespread basis, especially in biology. Reverse engineering encompasses a broad approach that asks many questions. How does the system work? How was it formed? How does it relate to other systems? What is its function or purpose? Has it experienced damage or corruption from its initial state? How has this corruption affected its functionality?

These kinds of questions are best answered by considering the wealth of information that comes not only from direct dissection and analysis of the specimen, but also from the broad range of background information regarding the specimen. In the case of

natural systems, this will typically involve metaphysical considerations.

Methodological naturalism commonly holds sway in the modern scientific enterprise, and for good reason. Appeals to the supernatural are typically not thought to be productive in the scientific method. However, scientific work can be roughly divided into three stages: data-collection, data-interpretation, and theory-building. And although reverse engineering makes extensive use of all three of these stages, only the first stage necessarily omits metaphysical considerations. When it comes to the reverse engineering of natural systems, such as the living cell, or large collections of cells, data interpretation and theory building are likely to be enhanced by metaphysical interpretations. The historic Christian worldview asserts that humankind was created by God, but suffered corruption. It is suggested that metaphysical considerations may be helpful when conducting such reverse engineering studies.

Saturday, 30 July 2011 4:00 PM

**Myth and Mystery:
Fostering New Avenues of Dialogue
for Faith and Science**
Matthew M Huddleston

Against the backdrop of generally perceived antagonism between science and religion, there have been many laudable attempts to reconcile Christian faith and modern science in recent years. Unfortunately, progress within both scientific and church communities has been frustratingly slow. Two relatively new avenues for extending this dialogue are argued for here.

First, I will demonstrate the inherent mythic component to major research projects by showing how scientists routinely, and often unknowingly, invoke the specific language of mythic narrative to attach meaning, value, ethics, and even eschatological hopes to their scientific research. Specific positive and negative examples of this practice from the fields of physics and astronomy will be presented in detail. I will then describe how those in the faith community could aid scientists in recognizing and thoroughly examining this mythic component of their work.

Secondly, I will examine the critical role of naturalistic “paradoxes” in scientific innovation over the years (focusing on physics and astronomy) and show how those paradoxes closely parallel specific “mysteries” rooted in Christian orthodoxy. The established use of paradox to spur science forward will be presented as a model for Christians to approach their faith from a discovery-based perspective. Instead of clamoring for dominance, science and Christianity, finding similar frontiers to human understanding, can adopt a healthy sense of humility in their common quest for truth.

Saturday, 30 July 2011 4:30 PM

**Fossils from Space: A Believer’s
Challenge or Blessing**
Robert S Geddes

If evidence for extraterrestrial life is to be discovered in the foreseeable future, it seems fated to be in the form of an ancient microbial fossil. A review of ancient microbial life forms on Earth shows that such a discovery would not only be socially arousing but scientifically controversial. Despite many recent analytical advances, there still exists much disagreement over the authenticity of specific ancient (Precambrian) fossil microbes.

A parallel debate surrounds the putative microfossils discovered in Martian meteorite ALH 84001. In the 15 years since its spectacular presidential pronouncement, the controversy over its authenticity shows no sign of abating. An extraterrestrial discovery of this kind will impact the Christian community with the question: “Why the fuss?” First of all, it may take decades for the scientific community to confirm such a discovery as authentic. Secondly, while challenges to the faith community are most often raised by scientists and journalists, Christian theologians appear primed to welcome and accommodate such a discovery.

Confirmation of an extraterrestrial microbe neither degrades nor reduces the Christian understanding of humanity’s spiritual place in the cosmos. In fact, it would likely broaden and enrich it. Similarly, the sense of spiritual wonder and responsibility that comes from admiring the starry skies,

long lost in the lights of the civilized world, may well return.

Sunday, 31 July 2011 4:00 PM

**Kenosis and the
Inspiration of Scripture**
George L Murphy

Some biblical statements about the physical world seem, in the light of today’s scientific knowledge, to be incorrect. The “firmament” of heaven and the waters above it in Genesis 1 are well-known instances. St. Paul’s belief that biological death of humans is a result of sin is an example of greater theological significance.

This poses important questions for those who take the authority of Scripture seriously. There have been three types of responses. We can reject some modern scientific views, read those views into the Bible by suitably interpreting the text, or say “The Bible is not a textbook of science” and declare the question a nonproblem. If we want to take both Scripture and modern science seriously, none of these responses is adequate.

Philippians 2:7 refers to the kenosis, the emptying or self-limitation, of the Son of God which was involved in fully assuming human nature. This concept has been applied to God’s activity in creation by a number of theologians. I will argue here that it is also relevant to the activity of the Holy Spirit in inspiring biblical writers. Just as God, in the Incarnation, accepted the limitations of a human being in a particular culture, so God accepts and works within the limits of the knowledge of the world that existed in the cultures in which the scriptures were written. We will consider implications of this concept as well as some objections to it.

Sunday, 31 July 2011 4:30 PM

**Uncertainty, Determinism,
Scientific Method, and the
Wisdom of Franz Boas**
David S Newman

Deterministic, ontological thinking prevailed in science throughout the 19th century. But the seed of uncertainty was planted by the new discipline of statistical physics.

Relativity challenged the notion that scientific theories are “the” laws of nature, but the new theory was still deterministic and still regarded as “ontologically true.”

Quantum theory *appears* to place probability, and therefore randomness, into the heart of physics, but there is now an alternative view with strong experimental support: Decoherence explains how the deterministic linearity of the quantum dynamics of a supposedly isolated system is made nonlinear by interaction with its environment, and how probability in the form of Born’s probability rule enters quantum physics naturally when a quantum system is observed. In complex systems, probability enters deterministic systems naturally through nonlinear chaos, because we can never specify initial and boundary conditions exactly.

The “synchronic” data used in statistical analyses and common to the natural sciences is contrasted with the “diachronic” data obtained in order to construct a meaningful scientific account of a culture, society, or individual. Franz Boas and his many students stressed the primacy of diachronic data for all the human sciences, data in the form of narrative from study subjects or field notes of investigators – case studies.

The extensive implications of these observations for science, theology, and philosophy will be discussed.

Monday, 1 August 2011 9:30 AM

The Fractal Nature of the Spiritual Journey—A Metaphor

Jason Hine

Concepts such as hope, despair, grace, love, evil, free will, and faith are frequent pillars of religious discussion, but these concepts are rarely the subject of scientific thought. And this is rightly so, for science currently lacks a useful frame of reference for these and other metaphysical concepts. Such a frame of reference, if one were found, could help facilitate conversations between scientific and religious viewpoints.

A study of the fractal commonly known as the Mandelbrot set suggests that certain kinds of fractals may

be useful as a basis for developing a metaphorical frame of reference in which the concepts of hope, despair, etc. are likened to patterns found near the fractal’s edge. This paper explores this potential frame of reference, starting with an abbreviated overview of the Mandelbrot set’s construction and mathematical characteristics. By taking some of these characteristics as analogous to certain aspects of the spiritual journey, key representations are developed and fashioned into a metaphorical model. Examining this metaphor reveals it as having several surprising strengths as well as severe limitations.

I conclude with thoughts on the metaphor’s possible relevance and usefulness to current science-faith discussions, and I suggest ideas for further exploration.

Monday, 1 August 2011 11:00 AM

Technology, Dispositional Values, and Virtue: Proposals for Addressing Emerging Technologies in Bioethics

Michael Sleasman

The notion of value-ladenness in technology has gained a level of general acceptance within philosophy of technology and many quarters of engineering ethics, particularly those pertaining to information and communication technology. Despite the growing relationship between information and communication technology and the biological and medical sciences, little attention has been given to these insights within the context of bioethics, and particularly Christian bioethics. Simply blaming technology for the evils of society or assuming that the technology in question is neutral, to name two common strategies, does not give adequate attention to the sophisticated nature of the technologies involved.

Given the rising convergence of NBIC (nanotechnology, biotechnology, information technology, and cognitive sciences) and the increasingly complex ethical issues raised by dual-use emerging technologies, it is no surprise that Christian bioethics is facing difficulty addressing these newly evolving realities – they differ in significant ways from their medical ethics antecedents.

This paper will develop the concept of value-ladenness in technology by means of a proposal of dispositional values and suggest resources within a Christian virtue tradition to assist in navigating the complex issues raised by emerging technology discussions in bioethics.

WITNESSING GOD'S GLORY AND SOVEREIGNTY IN CREATION

Sunday, 31 July 2011 4:00 PM

Quantum Openness and the Sovereignty of God

Donald N Petcher

Quantum mechanics (by most accounts) exhibits a striking openness or incompleteness that results in the unpredictability of the outcomes of specific events on the quantum level. This strange quantum behavior has been used to support a general openness not only in creation, but also in God (open theism). On the other hand, some in the Reformed camp argue that theological determinism is necessary, and based on known science, even psychological determinism may be needed to bring about God’s purposes in his creation, because the quantum world is too small in scale to be relevant for explaining events in the brain. Such questions raise others, particularly in regard to our moral responsibility before God.

In this talk, I will put forward an argument that the combination of quantum openness and the assumption of a holistic (nonreductive) creation suggests a psychological openness (e.g., free will) from the standpoint of creation, while still allowing for theological determinism from the standpoint of God. Thus I will argue that our scientific knowledge does not substantially constrain our theology of God, nor how he deals with his creation. Nevertheless, this openness in creation clearly points to God’s infinite wisdom in creating, giving him the glory.

Sunday, 31 July 2011

4:30 PM

**Prayers for Healing:
Does God Change His Mind?**

Paul H Lange

From Monday through Saturday, most physicians view the phenomenon of human diseases and their treatment in scientific (e.g., reductionist) ways. Then on Sundays, they squirm in their pews while the congregation prays for healing. Much of this "cognitive dissidence" occurs because physicians assume that among other things, these prayers are asking God to change the natural laws governing biological processes and disease (i.e., "changing God's mind").

Over the years, in my capacity as an academic cancer surgeon, I have developed a variety of methods to introduce medical colleagues and trainees to this subject and its resolution. This paper will describe these methods and my experiences. Briefly they entail (1) succinctly exposing them to the sophistication that exists among believing scientists and theologians about Divine Action (DA), for example, the work on DA emanating from the Vatican Observatory and CTNS, and (2) elucidating the many necessities for prayer other than physical healing.

Sunday, 31 July 2011

5:00 PM

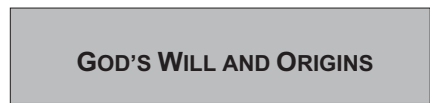
The Magnitude of God

Pamela L Bryant

I am a physical scientist by training, but in the course of working at Howard Payne University, I often teach biochemistry to pre-med students and astronomy as a general science course. It never ceases to amaze me how undergraduate college students, no matter their major, compartmentalize God and fit him into their world. They struggle to comprehend this world and develop an awareness of size. Isaiah 40:12 (Contemporary English Version), "Did any of you measure the ocean by yourself or stretch out the sky with your own hands? Did you put the soil of the earth in a bucket or weigh the hills and mountains on balance scales?" Yet, with their naked eye, they can see only a very few things and must use instruments to try and understand, rank, order, compare, and measure the invis-

ible so they can comprehend their function and place in their world; yet, what about God, where does he fit? Isaiah 40:18 (Holman Christian Standard Bible), "To whom, then, will you compare God? What image will you compare him to?"

Through my courses at Howard Payne, I help expand the students' view of size from string theory, to the atom, to molecules, to bacteria, to mites, to protein molecular motors, to man-made machines the size of mites, to themselves, to large animals, to the moon, to the earth, to the solar system, to nebula, to the galaxy, and beyond. This presentation, using numbers, expands the imagination and draws the audience into the vast magnitude of God. Psalms 33:6, 8b, 9 (Amplified Bible), "By the word of the Lord the heavens were made, and all the host of them by the breath of his mouth ... Let all the inhabitants of the world stand in awe of Him. For He spoke and it was done: He commanded and it stood fast." As we venture from the size of the quark to the size of the universe, the revelation of "God's size" leaves the audience with humility, awe, and a sober understanding of God's powerful omnipotence.



Sunday, 31 July 2011

4:00 PM

**God's Providence in Nature:
The Forgotten Doctrine
in the Relationship between
Science and Faith**

Gregory S Bennett

The doctrine of God's providence provides a critical framework for science and faith discussions, and can include the following: What is God's relationship with nature? Has God always preserved the properties of his creation throughout time? What has caused nature to be the way it is? What constitutes "natural" secondary causes and mechanisms? Is evolution one of those secondary causes?

Science and faith discussions are normally framed either from mechanisms that ignore or discount God's involvement in nature or from the doctrine of creation itself. As Christians,

we cannot accept the former, but as scientists we find the latter inadequate to help us understand God's relationship to scientific mechanisms.

In studying God's created order, aka nature, scientists assume predictability in what they study. Without predictability, experiments cannot reach consistent conclusions. Replication of investigative studies cannot be done. Thus, scientists focus on God's ordinary providence. This focus is as much a study of God's work as is the study of miracles (God's extraordinary providence). God has preserved, governed, operated, and directed everything in nature since time began. Providence provides a mechanism for understanding God's work in nature other than direct intervention as a Creator.

This presentation will explore a model for understanding how Providence underpins all scientific study. This model will show how an improved understanding of Providence helps science/faith discussions, how it gives a deeper appreciation for seeing God at work, and how it improves a person's ability to witness God's glory in nature.

Sunday, 31 July 2011

4:30 PM

**Dysteleology, Holoteleology, or
Intelligent Design**

David Wilcox and David W Hoferer

All are familiar with the claim that the causal linkages of natural processes exclude the designer's hand – that random processes have brought all into existence, leaving no room for purpose (dysteleology). Christians must disavow this, believing in the Triune God who designed everything with purpose.

The ID movement looks for breaks in causal chains in nature to show the intervention (and existence) of the designer. However, finding God only in our areas of ignorance is poor theology and self-defeating.

Genesis proclaims God's power – he calls all into existence by his fiat Word of power. But "all" includes time, an intrinsic part of the material cosmos. God's commands were not spoken "in" time, but outside of it, in eternity. We experience time passing, past beginnings and future ends. But God's

fiat speaks to all space and time from an eternal moment.

The creation's eschatological consummation has occurred. Thus, purpose can be seen flowing from ordained ends back to necessary causes. Creation's wave washes back to the Big Bang, but causal chains remain intact, the past determines the future, and science can still investigate causality. Science requires effects to follow causes without exterior constraints, not the absence of final cause in the system. To consider dysteleology necessary for science shows philosophical naïveté—or ideological commitment.

Holoteleology says all is designed, and finds evidence of God's hand in paradoxical outcomes of the process, not in causal breaks. This view more logically, biblically, theologically, and scientifically explains God's relationship with the cosmos, and fully supports scientific investigation.

Sunday, 31 July 2011

5:00 PM

A New Entropy Model for Biopolymer Folding: Yet Another Sign of the Divine Ingenuity in God's Creation

Wayne K Dawson

Previously, I have shown that the entropy of a folded biopolymer can be divided into local and global contributions using the cross-linking entropy (CLE) model, in which the cross-links, in the case of RNA, are the base-pair stacking interactions and, in the case of proteins, it is the spatial arrangement of the protein secondary structure elements. The local contribution results from freezing out of conformational degrees of freedom, and this, in turn, results in a nonlinear change in the global entropy and the folding time of a biopolymer. I have also shown that the free energy landscape of the model is largely funnel-shaped, using this entropy model which is highly successful at making structure predictions.

Here, I wish to consider how this model impacts the ongoing debates about evolution, intelligent design, and creation. First, our lack of adequate knowledge about the basic thermodynamics of these systems makes any

discussion about probabilities largely precarious. Though the model seems more likely to favor evolution, all sides have argued their position from a flawed model of the thermodynamics. Second, while this reveals yet another grain in the enormous warehouse of our ignorance, it also reveals the divine ingenuity of God in creating such complex systems from such profoundly simple chemical behavior.

WORLDVIEW PERSPECTIVES AND CREATION DEBATES

Sunday, 31 July 2011

4:00 PM

Biblical Portraits: Creation and Worldview

Richard F Carlson

An artist can employ considerable freedom in creating a portrait of a person. The artist can choose to emphasize certain qualities of that person. Hence, multiple portraits of the same person can look quite different, whether done by a number of artists or even by the same artist.

In this paper I will explore the implications of the writers of the Bible in presenting to us multifaceted pictures or portraits of events and even of people. I will discuss the implications of differing portraits of Jesus in the four Gospels, and the differing accounts of creation that comprise the first two chapters of Genesis. My thesis is that the two Genesis creation narratives (found in 1:1–2:3 and 2:4–25) present two portraits that differ in bare facts and yet together result in a complete and coherent worldview statement reflecting the ancient Hebrew understanding of their relation to God, to their world, and to each other, and furthermore, God's relation to all that exists. The sacred biblical author painted two different portraits of creation in order to accomplish this.

As a result, we need not agonize over the bare facts of the two accounts and how they, in some places, contradict the current scientific understandings in cosmology, earth science, or biology; instead, I will argue that it is more appropriate to concentrate on the underlying message of the two accounts—the worldview of the ancient Hebrews.

Sunday, 31 July 2011

4:30 PM

"Making Converts to Evolution": Methodological Naturalism as a Rhetorical Weapon in the *Origin of Species*

Stephen C Dilley

A close inspection of the *Origin of Species* shows that Darwin strategically and progressively deployed methodological naturalism (MN) in the six editions of the *Origin* in order to maximize the effectiveness of his "one long argument." That is, Darwin used MN in the *Origin* between 1859 and the early 1870s in a manner sensitive to the shifting views of his audience in order to bolster his theory and to marginalize special creation from the scientific discussion. In particular, Darwin's explicit use of methodological naturalism in later editions of the *Origin* was animated less by epistemic reasons and more by expedient ones. Thus, while Darwin personally may have had sound epistemic grounds for methodological naturalism, his progressive deployment of the method in the *Origin* seems to have been mainly for the purpose of winning converts to his theory and ostracizing special creation rather than making a strong empirical and philosophical case (per se) for evolution.

Sunday, 31 July 2011

5:00 PM

An Answer to Whitcomb and Morris's *The Genesis Flood*

Paul H Seely

This year is the fiftieth anniversary of *The Genesis Flood* by Whitcomb and Morris. It is the foundational book in the "creation science" movement. Unfortunately, its supporters write off the scientific evidence that tells us there was no global flood in the time of Noah. They believe the divine inspiration of Genesis guarantees that the history and science in the Flood account is factually inerrant, and they are committed to following a straightforward interpretation of the account without any compromise.

Rather than offering a local flood interpretation, which "creation science" followers would regard as a compromise, I will stand on *their* ground and insist they follow a straightforward interpretation of the Bible. I will then

point out seven places in the Flood account where Whitcomb and Morris did not follow a straightforward interpretation but, in fact, compromised the Word of God; and their followers still do. I will also show that if these compromises, i.e., contradictions of Scripture, were interpreted in a straightforward way, their theory of a global flood that killed all terrestrial life except those on the ark would collapse.

I will also tell how creation scientists themselves scientifically confirmed that one of Whitcomb and Morris's primary interpretations of the Bible was a compromising contradiction of Scripture.

This information will give those who are committed to scientific integrity an approach which has a chance of impacting Answers-in-Genesis-type thinking because it is based upon *their* presuppositions.

**SEEKING GOD'S WISDOM:
THE LIFE OF THE INDIVIDUAL**

Monday, 1 August 2011 9:00 AM

**Physicians in the Biblical World
Edwin Yamauchi**

It is striking that almost all the references to physicians in both the Old and the New Testament with the exception of "Luke, the beloved physician" (Col. 4:14) are negative. In no place in the Old Testament do we read that a doctor or medicine healed the sick. It is Yahweh who healed. In the early church, it was Christ who was the only reliable Healer.

Why this should be the case becomes clear when we examine the status of medicine in the ancient world. In Mesopotamia, most diseases and ailments were ascribed to demons. In Egypt, though we have specialists called dentists, x-ray examinations of royal mummies indicate that they were not able to effect any remedy for tooth decay. Though Hippocratic medical traditions in Greece rejected supernatural causes for epilepsy, their rational theory of four humors was based on philosophy and not on empirical evidence. Dissection of cadavers took place only briefly in Hellenistic

Alexandria. As a result, for nearly two thousand years, the most common remedy was venesection (bleeding of the veins). Jewish medicine as recounted in the Talmud was complicated by the desire to keep the Torah rules about the Sabbath and rules of purity. Christianity contributed to the concept of the *anargyroi* ("without silver") physicians who treated patients for free, and the rise of the first hospitals in the fourth century.

This survey raises the hermeneutical question of the two horizons of viewing the Bible in their original contexts, and applying its principles in the contemporary setting. We see that some attitudes must be viewed as descriptive and not prescriptive.

Monday, 1 August 2011 9:30 AM

**His Father's World
Joseph Lechner**

Maltbie Davenport Babcock (b. 1858) graduated from Auburn Theological Seminary in 1882 and was assigned to Lockport (NY) Presbyterian Church as his first pastorate.

"Lockport" was so named because a series of five consecutive locks were built here in the 1820s to raise the Erie Canal some seventy feet up the Niagara Escarpment. This same hard dolomite formation is very prominent at Niagara Falls. Once boats had ascended the final lock at Lockport, they could travel at the level of Lake Erie all the way to Buffalo.

Rev. Babcock's church was one block north of the locks, and the escarpment was approximately one mile north of his church. Babcock was fond of going for long walks along the cliffs, which afforded him a panoramic view of the surrounding farmlands and of Lake Ontario on a clear day. When setting out on these jaunts, he would habitually tell his secretary that he was going "out to see my Father's world."

Babcock died in 1901 on a cruise to the Holy Land, shortly after accepting a pastorate in New York City. His widow published a book of his letters, sermons, and poems. At least nine of the poems have been set to music. "This Is My Father's World," which

was inspired by hikes along the Niagara Escarpment at Lockport, has become a favorite of English-speaking Christian congregations in general and of ASA members in particular.

This presentation will include both vintage and contemporary photos of Lockport and the Erie Canal. If time permits and a piano is available, participants will be invited to sing *This Is My Father's World*.

Monday, 1 August 2011 10:00 AM

**The Burden of Proof:
Harry Rimmer and the Legacy of
Scientific Apologetics
Bethany Sollereeder**

Harry Rimmer was certain. He was certain of his science, and certain of his Bible. This fundamentalist preacher of the 20s and 30s deeply influenced evangelical culture by insisting that the Bible and "true science" could never conflict since they were both based on absolute fact.

Using Rimmer as a case study, this paper investigates how the mid-19th century shift toward a popular scientific culture influenced evangelical apologetics in the early 20th century. By adopting the Enlightenment rhetoric that science points to absolute truth, fundamentalists submitted Scripture to the tests of empiricism and built an apologetic framework to match. The apologetic strategy was to convince people intellectually that the Bible was true and to wait for the spiritual conversion to follow.

The trend to understand humans as primarily rational, and truth as scientific, has continued in much of the Christian scientific writings right up until today. From testable creation models to hermeneutical methods which emphasize the scientific accuracy of the Bible, evangelicals have continued to advance arguments deeply shaped by rationalist models of truth. In a postmodern culture, however, this limited view of truth makes evangelical apologetics increasingly irrelevant. This paper will conclude by proposing a few ways in which scientific apologists can testify to the faith in ways that do not alienate postmoderns.

Monday, 1 August 2011

11:00 AM

Christian, Engineer, and Entrepreneur: How Are They Related?

William M Jordan

Within ASA there have been many presentations that have attempted to relate Christian faith to the practice of engineering. The growing Business as Mission movement includes entrepreneurship by Christians in the developing world as one component of the movement. Technical entrepreneurship is a very vibrant field of professional development, as well as research. However, the combination of Christian technical entrepreneurship has been rarely explored.

This paper will examine technical entrepreneurship (TE) from a Christian perspective. The differences between TE in the developed world and in the developing world will also be explored. Among the topics to be discussed are

Is there a theology of technology? Is technology morally neutral or is it value laden? Can technology be value laden with Christian principles?

Is Christian technical entrepreneurship more than just technical entrepreneurship done by a person of Christian faith?

POSTERS

Sunday, 31 July 2011

2:45 PM

The Use of Genetic-Based Research in the Combat of Neglected Tropical Diseases: The First-World Response to the Majority World Problem

Caleigh Bates and Christine Williams

Neglected tropical diseases (NTDs) are a group of thirteen disabling conditions that are among the most common chronic infections in the world's poorest populations. Despite their global impact, NTDs have been severely disregarded in current scientific research and global health interventions. Within the fraction of research directed toward NTDs, the study of genetics has been successfully

integrated into the investigation of various parasitic helminthes.

The platyhelminth *Schistosoma* spp. is the causative agent of the devastating NTD, schistosomiasis. Affecting the lives of over 207 million people, the pathology of schistosomiasis is caused by the host immune response to parasitic eggs, resulting in fever, diarrhea, abdominal pain, and organ damage. In a promising genetic study, Freitas et al. (2007) identified the gene for the growth factor homolog *Schistosoma mansoni* inhibin/Activin (SmInAct) and its importance in the embryogenesis of the *S. mansoni*. The essential role of SmInAct was verified as *S. mansoni* eggs subjected to RNA interference and knockout of the growth factor aborted at a much higher rate than untreated eggs. While no vaccine has yet been discovered for schistosomiasis, this genetic intervention in the schistosome life cycle could potentially aid in disease prevention and eradication.

Christian scientists must confront neglected tropical diseases as they ravage the unified Body of Christ. First Corinthians 12:25-26 affirms, "[The body's] parts should have equal concern for each other. If one part suffers, every part suffers with it." Thus, this Christian response of compassion to human suffering requires responsible stewardship with available resources, ultimately seeking the hope that comes through divine restoration of creation.

Sunday, 31 July 2011

2:45 PM

An Evaluation Scheme to Increase the Effectiveness of Development Work

Virginia R Bracht

Thorough critiques of development projects designed to aid underdeveloped communities can help a development worker or agency focus on initiatives and technologies which cause real positive change. Here, an evaluation scheme for measuring the effectiveness of water development projects is put forth. This scheme takes into consideration several aspects of community development which contribute to a project's success, including a cost-benefit analysis and scoring systems for sustainability,

gospel ministry, education, and behavioral change.

The cost-benefit analysis is in terms of how many person-days of clean water per project cost are anticipated until significant repair is expected. The sustainability score measures the likelihood of a project to outlast external assistance. Gospel ministry is a measure of what emphasis the development worker puts on ministry during the intervention, and assumes that, for a Christian development worker, the primary purpose is to share the love of Christ. As with the gospel ministry score, the education score is a measure of the effort put forth by the development worker to include education about clean water, disease transmission, and sanitation. Behavioral change, the ultimate goal of any development work, is the most important aspect but often the hardest to measure. This score asks the question, How has the intervention caused real positive change in the target community?

Using this scoring system, development workers and agencies can effectively learn from past successes and failures, and it helps them to focus on those projects and technologies most workable in their region.

Sunday, 31 July 2011

2:45 PM

Temporal "Centrality" of Earth's Existence in the Universe?

Hui-Yiing Chang

Researchers who are interested in the intersection of faith and science have debated on the spatial centrality of Earth's existence in the universe; Earth is immobile in space and occupies a central position. It is also possible that Earth exists during a "central" epoch during the universe's lifetime.

In quintessence models of the universe, the density of nonrelativistic matter decreases more rapidly than the density of dark energy. Therefore, the matter density far exceeded the dark energy density in the distant past, while the dark energy density is expected to far exceed the matter density in the distant future. We are living in a period of "coincidence," where the dark energy and matter

densities are comparable. The coincidental period occupies different fractions of the total lifetime of the universe under different circumstances in the phantom dark energy and phantom cyclic models of the universe.

The purpose of this presentation is to provoke thinking and research on the timing of God's creation and its implications.

Sunday, 31 July 2011

2:45 PM

Alternative mRNA Splicing and the Expansion of the Human Proteome

Manika Clemente, David Lee, and Annie Poirier

As the human genome and proteome have been analyzed, the proteome has been found to be larger than the genome. In short, there are more unique proteins than there are genes to encode them. This puzzle was largely solved by the discovery of alternative mRNA splicing, a mechanism by which a single gene can generate a variety of different protein molecules.

When an mRNA transcript is spliced, segments of it are removed and those remaining are joined to form one of its numerous potential mature transcripts. Each of these transcripts can potentially specify a different polypeptide. The mature mRNA transcript produced is dependent on the mode of alternative splicing employed. These various splicing mechanisms allow for great complexity and variation within the proteome.

Numerous perspectives are held concerning the way in which the processes of alternative mRNA splicing should affect one's worldview. Above all, we believe the topic should be approached with the firm acknowledgment that God is responsible for creation in all of its complexity (Ps. 139:14), regardless of the specific mechanisms he has used to achieve it. Alternative splicing involves intricate processes that some argue show evidence of design. Others, however, contend that the inefficiency of constructing large segments of mRNA, which must be removed before the molecule is useful, detracts from the theory of Intelligent Design. Still others leave this debate behind and focus on the contribution of alternative splicing

to the complexity and variety of the proteome as a wonderful reason for worship of the Creator.

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The Absence of CCR5 Co-receptors and HIV Resistance

Valerie Francis and Elyse Masson

Human immunodeficiency virus/acquired immunodeficiency disorder (HIV/AIDS) is a debilitating disease which not only eventually causes death, but also disrupts entire communities, leaving orphans and disabling whole generations so that they are unable to function in the national economy.

HIV is caused when the HIV, an RNA virus, enters the body and attacks CD4+ cells of the immune system. The virus enters the cell and incorporates its own DNA into the host genome.

It then promotes DNA transcription in order to self-replicate, an action which also kills the host cell. AIDS develops once CD4+ cell levels drop below a certain level. However, this process can only occur if the virus is actually able to enter the cell. In order for the virus to bind to the cell surface, certain surface proteins, such as the CCR5 protein, must be present. Resistance to HIV occurs when these proteins are absent. Currently, research is underway to find treatments for HIV which could involve blocking CCR5 expression. These methods include the use of siRNAs and ribozymes to degrade or cleave specific RNA molecules before they are expressed. Additionally, intrabodies could be used to decrease the expression of certain surface proteins, and zinc finger nucleases have the potential to target and edit certain DNA sequences in order to prevent the transcription of a normal surface protein.

Research to find an effective treatment for HIV/AIDS is extremely important, especially in the light of our call as Christians to promote human dignity and care for the poor and oppressed. Since Christ entered into our suffering in the Incarnation, it is now our responsibility to enter into the suffering of others and, through Christ, work to bring his justice and love where oppression and pain currently dominate.

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Genetic Conservation and the Reintroduced Gray Wolves of Yellowstone

Taylor Gevry and Joanna Helm

Through the techniques and ideals of conservation genetics, the reintroduced gray wolves of Yellowstone are being observed and tested for genetic diversity. In 1995–1996, sixty-six gray wolves were reintroduced into the Yellowstone region. This controversial reestablishment of the wolf population has provided scientists with an opportunity to study a growing population genetically from its beginning.

Four different studies were analyzed to assemble a concise summary of the status of the Yellowstone gray wolves. A Christian response to the reintroduction as well as to the four studies is also addressed.

- The first study to be analyzed showed that just a year after reintroduction, the genetic viability and diversity of the packs was comparable to wild packs. This analysis was done using microsatellite markers.
- The second study tested for wolf-coyote hybridization by assessing the presence or absence of a specific loop on the mtDNA of coyotes, which would mean inadequate opportunities for breeding or feeding. However, no subjects tested showed signs of hybridization.
- The third study attempted to estimate the population size of the wolves using non-invasive sampling and microsatellites.
- The final study occurred ten years after reintroduction and showed evidence of increased genetic diversity and viability, even higher than wild packs.

The studies show the success so far of this reintroduction. On the spiritual side, this reintroduction is also deemed a success due to its restoration of creation in not only the wolf population but the Yellowstone basin ecosystem as well.

Sunday, 31 July 2011

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**Serving Humanity through
Water, Sanitation and
Hygiene Technology:
Serving and Learning through
a Year-Long Course Sequence**
Michael D Guebert

Since 2003, students and faculty at Taylor University have participated in an international service-learning course sequence focusing on international community development and appropriate technologies of water resources, sanitation, and hygiene (WaSH) to improve health in rural communities of Guatemala. During this three-week January course, Water Resources and Appropriate Technology, students participate in technical projects, including well-drilling, well-head protection, pump installation/repair/maintenance, roof-catchment cisterns, latrine design and construction, water quality treatment/protection, low-fuel stoves, community health and environment assessments, and hygiene and sanitation education. Students also gain cross-cultural experience, interpersonal development and communication, and personal integration of their call to global service.

Prior to the trip, students prepare technically and cross-culturally during the fall semester in three requisite courses: Hydrogeology, Introduction to Cross-Cultural Service, and Missions Technology. Students learn to site and drill a well. They read, research, discuss, and write on topics of water resources, health, and sanitation. They also read about community development, cross-cultural communication, personal assessments, and the characteristics of the host country, Guatemala.

Following the trip during the spring semester, students may continue study in three optional courses: World Water Resources, Preparation and Strategy for World Mission, and International Community Development. These courses expand students' understanding of the need, potential, and complexity of water resources, issues of rural and urban international community development, and strategies for addressing the concerns. Some graduate students in environmental science cap their experience

with a six-month graduate internship in international water resources and community development conducted through one of several partner institutions.

Sunday, 31 July 2011

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**Science in the Prevention of
Chronic Disease: A Mixed Review**

Jay L Hollman

Data from population studies in the early 1990s suggested that vitamins, specifically anti-oxidants such as vitamins C and E would reduce the risk of cancer and heart disease. Lowering homocysteine through B vitamins was to reduce vascular disease. Unfortunately, when randomized trials were completed by the middle of the last decade, it was clear that vitamin supplements were not effective at reducing chronic disease.

The food industry has endeavored to produce healthier foods but created trans-fats that probably increased the risk of vascular disease. The food industry has added refined sugar which is a risk factor for obesity, metabolic syndrome, and type 2 diabetes and has added salt which increases our risk of developing hypertension, heart disease, and stroke.

Prescription drugs are supposed to reduce the risk of chronic disease, and to a large extent, the statin drugs, which reduce LDL-cholesterol, do reduce the risk of cardiovascular disease. Newer drugs such as torcetrapib and ezetimibe do not have clear benefits. The diabetic drug, rosiglitazone, effectively lowers average blood sugar, but increases cardiovascular events. Diet drugs Redux and Meridia were both withdrawn from the market.

The best science would now suggest that a combination of exercise, low body fat content and a healthy diet, consumption of fruits and vegetables especially in their natural presentation with limited consumption of animal products, is the best protection against chronic disease. What is clear is that a person cannot be fat, lazy, and eat a rich diet and expect to be rescued by vitamin supplements, food technology, or the pharmaceutical industry.

Sunday, 31 July 2011

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Genetics and Personalized Medicine
Katey LePage and Morgan Manchester

Personalized medicine, also referred to as pharmacogenetics, involves the study of patient responses to different drug treatments due to hereditary traits. Currently, there are a few widely used treatments that specifically take advantage of the application of pharmacogenetics. These treatments include the cancer treatment drugs Gleevec and Herceptin. Gleevec is the molecular targeted agent STI571 that is specifically directed at the constitutive tyrosine kinase activity of *bcr-abl*. *Bcr-abl* is an oncogene present in 95% of people diagnosed with chronic myelogenous leukemia (CML). Herceptin is a monoclonal antibody that targets Human Epidermal growth factor Receptor-2 (HER-2). The overexpression of this receptor is responsible for 30% of the diagnosed cases of breast cancer. The clinical application of pharmacogenetics leads to many ethical issues that need to be considered. These ethical issues include equality in availability of treatments to all socioeconomic classes and privacy issues that accompany procedures involving personal genetics. While treatments using these scientific advancements offer great opportunities for the treatment of debilitating diseases including cancer, Christians especially have a responsibility to consider the ethical implications regarding these applications of pharmacogenetics as this type of treatment is becoming increasingly widespread. Future research in this field continues to be promising in the efforts to mitigate many other side effects.

Sunday, 31 July 2011

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**Thinking Skills Education:
Using Design Method and
Scientific Method**
Craig Rusbult

Creativity and critical thinking are combined for goal-directed problem solving in a wide range of areas (engineering, architecture, medicine, mathematics, music, art, literature, philosophy, history, business, athletics, law, science, etc.) to design a product,

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strategy, or theory. This includes almost everything we do in life. How can we help students improve these skills? What are the similarities and differences between science and design? Why should we teach design before science?

During and after my PhD work, I've developed educationally useful models of Scientific Method and Design Method, and strategies for using them effectively to help students learn thinking skills. For an overview and sampler of ideas about science and design, plus links, go to asa3.org/ASA/education/think/scientific-method.htm#ism

Sunday, 31 July 2011 **2:45 PM**

Race and Medicine: Enalapril Kyle Tretina and Laura Frantz

Carl Linnaeus, as well as a number of 18th-century naturalists, used the concept of race to distinguish populations in different areas on the basis of differing physical characteristics such as skin color and facial features. Racial classification today can affect access to resources, the distribution of income and wealth, political power, residential living patterns, and interpersonal relationships.

Recent research found evidence of genetic clusters that correspond to geographically similar populations which in turn also correspond to major geographic regions, but the differences between these groups are limited (Rosenburg et al., 2002). However, the bias in this study's sample collection was exposed and Serre and Paabo (2004) found that "when individuals are sampled homogeneously from around the globe, the pattern seen is one of gradients of allele frequencies, rather than discrete clusters."

The infamous promiscuity of humankind as proposed by many scientists, such as Darwin, has been shown to hold true and resulted in the continuous confluence of genetic information between neighboring populations. However, race as a form of population thinking in medicine persists, largely due to correlations of race to an increase in the frequency of medical conditions such as heart disease. Here, enalapril is used as a case study to

perform a theological and utilitarian analysis on the use of race as a form of population thinking, its consequences for genetic racialization, and consider a new paradigm for drug studies.

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Sunday, 31 July 2011 **7:30 PM**

Test of FAITH: Introductory Resources on Science and Christianity Ruth Bancewicz

Christians working in science and engineering are often asked to lead study groups or give talks on science and faith in a number of settings. These are perfect opportunities to explode the myths about conflict between science and faith, enable Christians to worship God as they discover more about his world, and encourage Christian young people to pursue careers in science.

The range of resources available for teaching on science and faith is largely limited to books and articles, but presentations and group study today use video, story, discussion and interactive activities. Preparing high quality teaching material can be an onerous task, and many are discouraged by lack of time or experience.

The "Test of FAITH" resources were developed to equip scientists and other Christian leaders to teach groups of nonscientists about the relationship between science and faith in both the USA and UK. The centerpiece of the material is a documentary in which Christian scientists and theologians respond to the question, "Does science threaten belief in God?" Contributors include Francis Collins, Jennifer Wiseman, Rosalind Picard, Sir John Polkinghorne, Bill Newsome, Alister McGrath, Deborah Haarsma, Denis Alexander, Simon Conway Morris, Ard Louis and Cherith Fee Nordling.

This seminar will introduce the "Test of FAITH" video, print and online resources (including a 30-minute showing of part 1 of the documentary). Time will be allowed for discussion of their use in the classroom and more informal settings.

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ASA Business Meeting Agenda

Saturday, 31 July 2011, 6:45 PM, Wentz Concert Hall

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| 1. Call to order and opening prayer | Susan Daniels |
| 2. Introduction of staff | Randy Isaac |
| 3. Future meetings | Randy Isaac |
| 4. Introduction of newly elected Fellows | Randy Isaac |
| 5. Recognition of fifty years of ASA Membership | Randy Isaac |
| 6. Remembrances | Randy Isaac |
| 7. Secretary/Treasurer Report | Hal Poe |
| 8. State of the ASA | Randy Isaac |
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